APPENDIX J. AGRICULTURAL PHOSPHORUS AND SEDIMENT TARGETS

1 INTRODUCTION AND NEED

Total Maximum Daily Load (TMDL) load allocations (LA) for agricultural sources can be challenging to incorporate into TMDL implementation planning efforts due to: 1) the dependence of nonpoint source pollutant loading on weather, soil, and land management practices that vary widely in space and time; and 2) conceptual differences between watershed models used for TMDL development and field-scale models used by agricultural producers to estimate nutrient and sediment losses under alternative management practices.

Wisconsin Department of Natural Resources (WDNR) has developed a framework for communicating agricultural LAs to translate results of the watershed model used for TMDL development to field-scale model outputs that are better understood by the agricultural community. The framework serves as a tool for producers to evaluate Best Management Practices (BMPs) to implement on their own fields in order to meet TMDL LAs.

This Appendix reports target phosphorus and sediment yields for agricultural sources in the Upper Fox and Wolf Basins (UFWB) that are comparable to outputs from SnapPlus (Soil Nutrient Application Planner), the standard nutrient management planning software used by Wisconsin agricultural producers.

2 USE OF THIS APPENDIX

2.1 Meeting TMDL Load Allocations on Agricultural Lands

SnapPlus (Soil Nutrient Application Planner) is Wisconsin's nutrient management planning software. The program helps farmers make the best use of their on-farm nutrients, as well as make informed and justified commercial fertilizer purchases. By calculating potential soil and phosphorus runoff losses on a field-by-field basis while assisting in the economic planning of manure and fertilizer applications, SnapPlus provides Wisconsin farmers with a tool for protecting soil and water quality.

Producers can use SnapPlus software to verify whether their management plans are meeting TMDL targets for phosphorus and sediment yields. First, producers need to determine the appropriate target phosphorus and sediment yields defined by the TMDL for their location. To allow for flexibility in planning, this appendix provides target phosphorus and sediment yields for three separate watersheds scales. Each watershed scale divides the entire Upper Fox and Wolf River Basins (UFWB) study area into discreet subunits but the scales differ in their exact drainage boundaries. The three watershed scales are:

- TMDL Subbasins. TMDL Subbasins are the units used to define baseline phosphorus and sediment loads for the TMDL and developing pollutant load allocations. The entire UFWB is divided into 89 TMDL Subbasins.
- Model Subwatersheds. Model Subwatersheds are the units used for Soil and Water Assessment Tool (SWAT) watershed modeling and lake modeling completed to support TMDL development. The Model Subwatersheds are generally smaller than, and nest within, TMDL Subbasins. The entire UFWB is divided into 223 Model Subwatersheds.
- 12-Digit Hydrologic Units (HUC12s). HUC12s are the smallest watershed unit in the National Watershed Boundary Dataset maintained by the US Department of Agriculture Natural Resources Conservation Service (USDA NRCS). HUC12s are commonly used for watershed planning by government agencies and watershed groups. The entire UFWB is divided into 166 HUC12s.

Producers can determine which TMDL Subbasin, Model Subwatershed, or HUC12 their fields are located within using maps provided in this appendix. Section 7 contains maps of TMDL Subbasin and Model

Subwatershed boundaries by county. Section 8 contains maps of HUC12 boundaries by county. If these figures are too coarse for locating farm fields, the Upper Fox and Wolf River Basins TMDL theme of the interactive Watershed Restoration Viewer can be used instead (type “watershed restoration viewer” into the search bar at http://dnr.wi.gov) by clicking the “Layer” tab on the left-hand panel, then locate the layers called “TMDL Subbasins” and “Model Subwatersheds” under “Specific TMDLS, Upper Fox and Wolf Basins”. Similarly, users can identify which HUC12 their field is located within by using the interactive Water Condition Viewer (type “water condition viewer” into the search bar at http://dnr.wi.gov) by clicking the “Layer” tab on the left-hand panel, then locate the layer called “12-digit HUCs” under “Water Resources, Hydrologic Delineations, Federal Hydrologic Unit Codes (HUC)”.

After locating their TMDL Subbasin, Model Subwatershed, or HUC12, producers can refer to Table 1 through Table 3 to determine the appropriate target SnapPlus phosphorus and sediment yields for their location that correspond to the TMDL agricultural LAs.

Producers can then use SnapPlus to create or modify a database for each field within their farm to (a) reflect actual (not planned) cropland practices (e.g., tillage, crop rotation, nutrient applications) they have implemented; and (b) ensure all fields within the SnapPlus “Fields” menu use the predominant soil as the critical soil type (within SnapPlus, the critical soil type is used to generate soil and P loss estimates). Once SnapPlus reflects (a) and (b), producers can use SnapPlus reports to compare each crop rotation they manage to the total phosphorus (TP) and total suspended solids (TSS) targets. If annual average TP and TSS losses for a given crop rotation exceed the TP and TSS targets in Tables 1 through 3, then that crop rotation exceeds the TMDL agricultural LA, and additional reductions are needed.

3 WATER QUALITY TRADING AND TMDLS

Water Quality Trading (WQT) may be used by Wisconsin Pollutant Discharge Elimination System (WPDES) permit holders to demonstrate compliance with water quality-based effluent limitations (WQBELs). Generally, WQT occurs when a point source facing relatively high pollutant reduction costs compensates another party to achieve less costly pollutant reduction that yields the same or greater water quality benefit. In other words, WQT provides point sources with the flexibility to offset their pollutant load reductions by providing financial resources to reduce pollutants from other sources in the watershed.

Point sources can receive credit for reducing phosphorus and sediment loss on agricultural fields (WDNR, 2013a, pp. 10-15). In the UFWB, the value of the credit will depend on whether the agricultural field is currently exceeding the allowable yield of phosphorus (calculated using SnapPlus) listed in Tables 1 through 3 on an annual average basis. If the agricultural field is currently exceeding the allowable yield, adoption of additional conservation practices that reduce annual phosphorus loss below the allowable yield in Tables 1-3 can generate “interim credits” for a maximum of five years and also “long term credits”. The difference between interim and long-term credits is that 5 years after practice implementation, interim credits are no longer available for point sources to offset their reduction—after 5 years, credit can only be given for reductions below the allowable yield (i.e. going above and beyond what is required to meet load allocation goals).

> Example: Using the methodology described above, a farm field has a baseline phosphorus loss of 4 pounds per acre per year (lbs./ac/yr.). The TMDL LA, as translated by SnapPlus, is equivalent to a phosphorus loss of 2 lbs./ac/yr. To generate trading credits, an agricultural producer reduces the phosphorus loss on the field from 4 to 1 lbs./ac/year through additional conservation practices. Because the TMDL LA is 2, there is 1 lbs./ac/year available for WQT as long-term credit. The 3 lbs./ac/year reduction is also available for WQT, but as interim credit, available for the first

5 years only.

Interim Credits Available (available for first 5 yrs.): 3 lbs./acre/year (i.e., 4 - 1 = 3)
Long-term Credits Available (available after first 5 yrs.): 1 lbs./acre/year (i.e., 2 - 1 = 1)

After the load reduction has been estimated, a trade ratio must be applied to calculate credits available for WQT. Trade ratios are required to be applied determine the number of water quality credits available on a field (WDNR, 2013b, pp. 14-25). All WQ trades have some margin of uncertainty associated with them and therefore require applying a trade ratio to all phosphorus reductions generated. The trade ratio adjusts the number of WQT credits needed to: a) account for uncertainties or potential inaccuracies associated with the trade, and b) ensure that trade results in a greater pollutant reduction than would otherwise be achieved absent the trade. The trade ratio directly impacts the economic feasibility of WQT—the higher the trade ratio, the more credits that will need to be generated for the offset. Every trade will have a unique trade ratio given the site-specific concerns of the trade in question (WDNR, 2013a, Appendix A).

4 MODELING METHODS

4.1 TMDL Baseline Loads, Allocations, and Reductions

The UFWB TMDL expresses pollutant LAs for nonpoint sources as average daily and annual loads (pounds) of TP and TSS that result in attainment of surface water quality standards in each TMDL Subbasin. The agricultural LAs are derived from baseline loads estimated using the SWAT watershed model. Percent reductions are also calculated for agricultural sources in each TMDL Subbasin using LAs and baseline loads derived from the SWAT model as:

$$\%\ Reduction = \left(1 - \frac{Load\ Allocation}{SWAT\ Baseline\ Load}\right) * 100$$

Within the SWAT model, data on land cover, soils, topographic slopes, and agricultural management practices throughout the UFWB are used to estimate baseline pollutant loads at the outlet of each Model Subwatershed and TMDL Subbasin mapped in Section 7. Baseline loads and TMDL allocations, therefore, reflect loading magnitudes within stream and river channels at watershed outlets. Because there is typically a gradual loss of phosphorus and sediment as the load travels downstream from uplands sources such as farm fields to a watershed outlet, the baseline loads and LAs derived from the SWAT model are not directly comparable to field-scale loading estimates for upland sources (i.e., phosphorus and sediment losses estimated at a field edge). To facilitate TMDL implementation planning, WDNR has translated baseline agricultural loads and LAs to field-scale baseline and target TP and TSS yields that are comparable to results from the SnapPlus model. This translation is described in the following sections.

Note that other BMPs not related to cropping practices can also be implemented to comply with the TMDL, for example water and sediment control basins, or barnyard improvement. In these cases, modeling tools specific to these BMPs must be used for assessing whether load reductions comply fully with the TMDL.

4.2 SnapPlus Translation of Baseline Loads

To convert baseline agricultural loads derived from SWAT to field-scale baseline yields, we first translated inputs used for the UFWB SWAT model into corresponding inputs to the SnapPlus model. The UFWB SWAT model simulates phosphorus and sediment loss from several agricultural cover types, with different management operations (cropping, tillage, fertilizer, etc.) applied to each type. The agricultural cover types represented in the SWAT model were selected based on land cover imagery and feedback from county land and water conservation departments (see Appendix C for a detailed description of the UFWB SWAT model).

SWAT agricultural cover types were initially translated into SnapPlus "fields" in a template SnapPlus database. Settings for these SnapPlus fields reflected the same crop rotations, tillage, fertilizer, and manure application rates as SWAT agricultural types. Using these template fields as a starting point, additional SnapPlus fields were defined, each with a unique combination of agriculture type, soil type, soil phosphorus, topographic slope, and watershed location. The following steps were applied to define the additional SnapPlus fields:

a) A geographic overlay of soil types in the Web Soil Survey (SSURGO) database and Model Subwatershed boundaries was completed to identify and map unique soil types within each Model Subwatershed.
b) A geographic overlay of soil types in the SSURGO database and HUC12 boundaries was completed to identify and map unique soil types within each HUC12.
c) The average slope in each unique soil type-watershed combination identified in steps (a) and (b) was calculated by summarizing 10-meter resolution grid cells in a Digital Elevation Model (DEM) from the National Elevation Dataset (NED);
d) The average soil phosphorus content of each unique soil type-watershed combination identified in steps (a) and (b) was calculated as the area-weighted average of county-level averages of soil phosphorus samples;
e) The soil type-watershed combinations identified in steps (a) and (b) were further overlaid with a map of SWAT agricultural cover types to identify 88,602 unique combinations of soils, watersheds, and agricultural cover types in the UFWB.

The 88,602 combinations of soils, watersheds, and agricultural cover types were modeled as individual SnapPlus fields, each with specific settings for land management, dominant soil type, soil phosphorus, and slope. The resulting phosphorus and sediment yields from SnapPlus were averaged for each TMDL Subbasin, Model Subwatershed, and HUC12 to calculate baseline TP and TSS yields (Tables 1 through 3).

4.3 Calculation of SnapPlus Target Yields

As described in Section 4.1, percent reductions are calculated for sources in each TMDL Subbasin using LAs and baseline loads derived from SWAT. Baseline TP and TSS yields from the SnapPlus model runs were converted to target SnapPlus yields by applying the percent reductions corresponding to TMDL attainment to baseline SnapPlus values.

Because percent reductions are calculated from TMDL Subbasin LAs, they are unique to TMDL Subbasins and are not calculated for any other watershed scale (Model Subwatersheds and HUC12s). SnapPlus yield targets for the other watershed scales are calculated by applying the percent reduction corresponding to the TMDL Subbasin that the watershed is located within. For example, since Model Subwatershed 1 is in TMDL Subbasin 78, we use the percent reduction for TMDL Subbasin 78 (34%) to determine the SnapPlus target yield for Model Subwatershed 1. In some cases, HUC12s are larger than TMDL subbasins, and in other cases the converse is true, and therefore the percent reductions and SnapPlus target yields for HUC12s are area-weighted averages of the values associated with overlaying TMDL subbasins. In Table 3, when there is overlap between HUC12s and multiple TMDL Subbasins, only TMDL Subbasins that comprise 10% of its total area are listed in the TMDL subbasin column.

The following pages provide three examples to demonstrate how target yields were calculated for TMDL Subbasins, Model Subwatersheds, and HUC12s.

Example A. Calculation of SnapPlus Target TP Yield for Model Subwatershed 194

The SnapPlus target yield for Model Subwatershed 194 is calculated from:

TP % Reduction for TMDL Subbasin 15. Since Model Subwatershed 194 is located in TMDL Subbasin 15, the TP percent reduction for agricultural sources in Model Subwatershed 194 is set to the percentage reported for TMDL Subbasin 15 (83%; see Appendix H, Table 6).

SnapPlus Baseline Yield for Model Subwatershed 194. The SnapPlus baseline yield for Model Subwatershed 194 is calculated by averaging SnapPlus results for all fields located in Model Subwatershed 194. Of the 88,602 total SnapPlus fields, 1,932 are located in Model Subwatershed 194. The average TP yield for these 1,932 fields is 2.37 pounds per acre per year.

The SnapPlus target yield for Model Subwatershed 194 is calculated as:

$$SnapPlus\ Target\ Yield = SnapPlus\ Baseline\ Yield * (100\% - \%\ Reduction)$$

$$SnapPlus\ Target\ Yield = 2.37\ lbs/ac/yr * (100\% - 83\%)$$

$$\underline{\boldsymbol{SnapPlus\ Target\ Yield = 0.41\ lbs/ac/yr}}$$

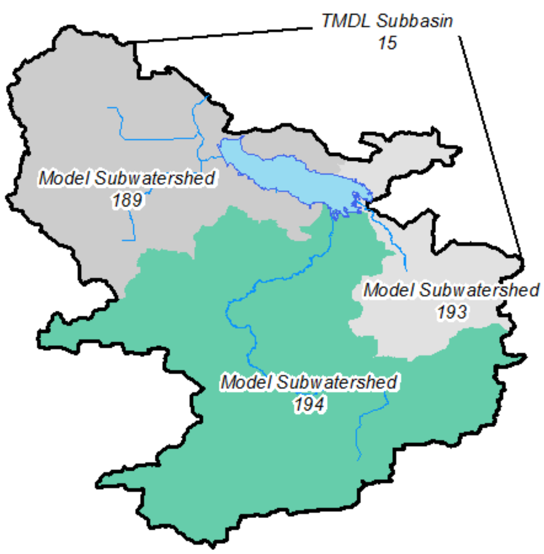


Figure 1. Map of Model Subwatershed 194, located within TMDL Subbasin 15.

Example B. SnapPlus Target TP Yield for TMDL Subbasin 15 (Lower Grand River)

The SnapPlus target yield for TMDL Subbasin 15 is calculated from:

TP % Reduction for TMDL Subbasin 15. The TP percent reduction for agricultural sources in TMDL Subbasin 15 is 83% (see Appendix H, Table 6).

SnapPlus Baseline Yield for Model Subwatersheds 189, 193, and 194. The SnapPlus baseline yield for TMDL Subbasin 15 is calculated by averaging SnapPlus results for the three Model Subwatersheds (189, 193, and 194) that are located in TMDL Subbasin 15. Model Subwatershed yields are area-weighted when calculating the TMDL Subbasin value. The area-weighted average SnapPlus TP yield for these three Model Subwatersheds is 2.13 pounds per acre per year (Table 1).

The SnapPlus target yield for TMDL Subbasin 15 is calculated as:

$$SnapPlus\ Target\ Yield = SnapPlus\ Baseline\ Yield * (100\% - \%\ Reduction)$$

$$SnapPlus\ Target\ Yield = 2.13\ lbs/ac/yr * (100\% - 83\%)$$

$$\underline{\boldsymbol{SnapPlus\ Target\ TP\ Yield = 0.36\ lbs/ac/yr}}$$

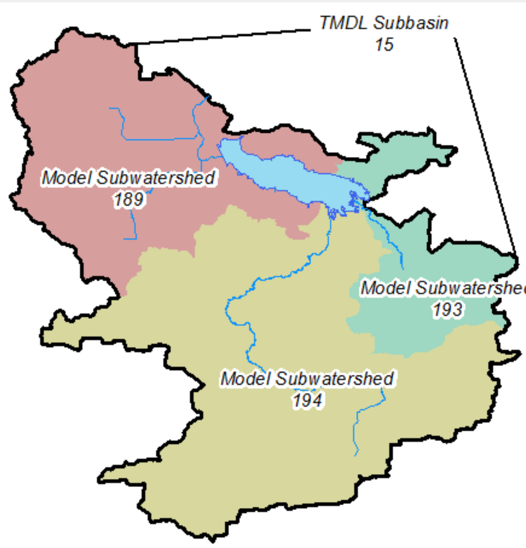


Figure 2. Map of TMDL Subbasin 15, which contains three Model Subwatersheds (189, 193, and 194)

Example C. Calculation of SnapPlus Target TP Yield for HUC 040302021803 (Spring Creek)

The SnapPlus target yield for the Spring Creek HUC12 is calculated from:

TP % Reduction for TMDL Subbasins 66 and 86. Since the Spring Creek HUC12 intersects two TMDL Subbasins (66 and 86), two separate percent reductions for agricultural sources in the Spring Creek HUC12 are used. The percent reductions are set to percentages reported for TMDL Subbasin 66 and 86 in Appendix H, Table 6 (83% and 55%, respectively).

SnapPlus Baseline Yield for the Spring Creek HUC12. The SnapPlus baseline yield for the Spring Creek HUC12 is calculated by averaging SnapPlus results for all fields located in the Spring Creek HUC12. Of the 88,602 total SnapPlus fields, 402 are located in the Spring Creek HUC12. The average TP yield for these 402 fields is 2.32 pounds per acre per year.

Because the Spring Creek HUC12 intersects two or more TMDL Subbasins, separate SnapPlus target yields are calculated for TMDL Subbasins that intersect the HUC12 watershed. The baseline and target load for scenarios with two or more TMDL Subbasins in a HUC12 have been calculated and appear in Appendix J, Table 3. The SnapPlus target yield for Spring Creek HUC12 is then calculated as:

$$SnapPlus\ Target\ Yield\ 1 = SnapPlus\ Baseline\ Yield * (100\% - \%\ Reduction\ 1)$$

$$SnapPlus\ Target\ Yield\ 1 = 1.49\ lbs/ac/yr * (100\% - 83\%)$$

$$\underline{\boldsymbol{SnapPlus\ Target\ Yield\ 1 = 0.25\ lbs/ac/yr}}$$

$$SnapPlus\ Target\ Yield\ 2 = SnapPlus\ Baseline\ Yield * (100\% - \%\ Reduction\ 2)$$

$$SnapPlus\ Target\ Yield\ 2 = 1.49\ lbs/ac/yr * (100\% - 55\%)$$

$$\underline{\boldsymbol{SnapPlus\ Target\ Yield\ 2 = 0.67\ lbs/ac/yr}}$$

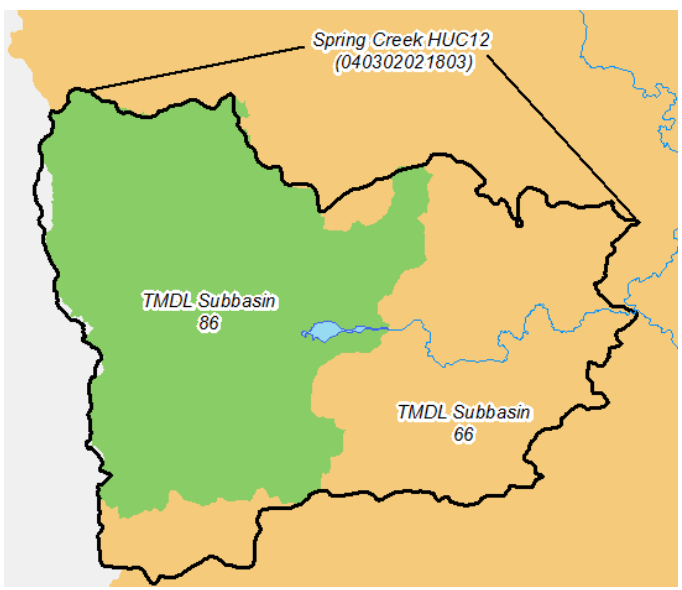


Figure 3. Map of the Spring Creek HUC12 (040302021803), which contains two TMDL Subbasins (66 and 86).

5 WISCONSIN DNR CONTACTS

For producers and resource managers that are interested in using this method for TMDL implementation planning, please contact your WDNR nonpoint source coordinator:

https://dnr.wi.gov/topic/nonpoint/npscontacts.html

Or, for dischargers who are interested in using this method for WQT, please contact your WDNR water quality trading coordinator:

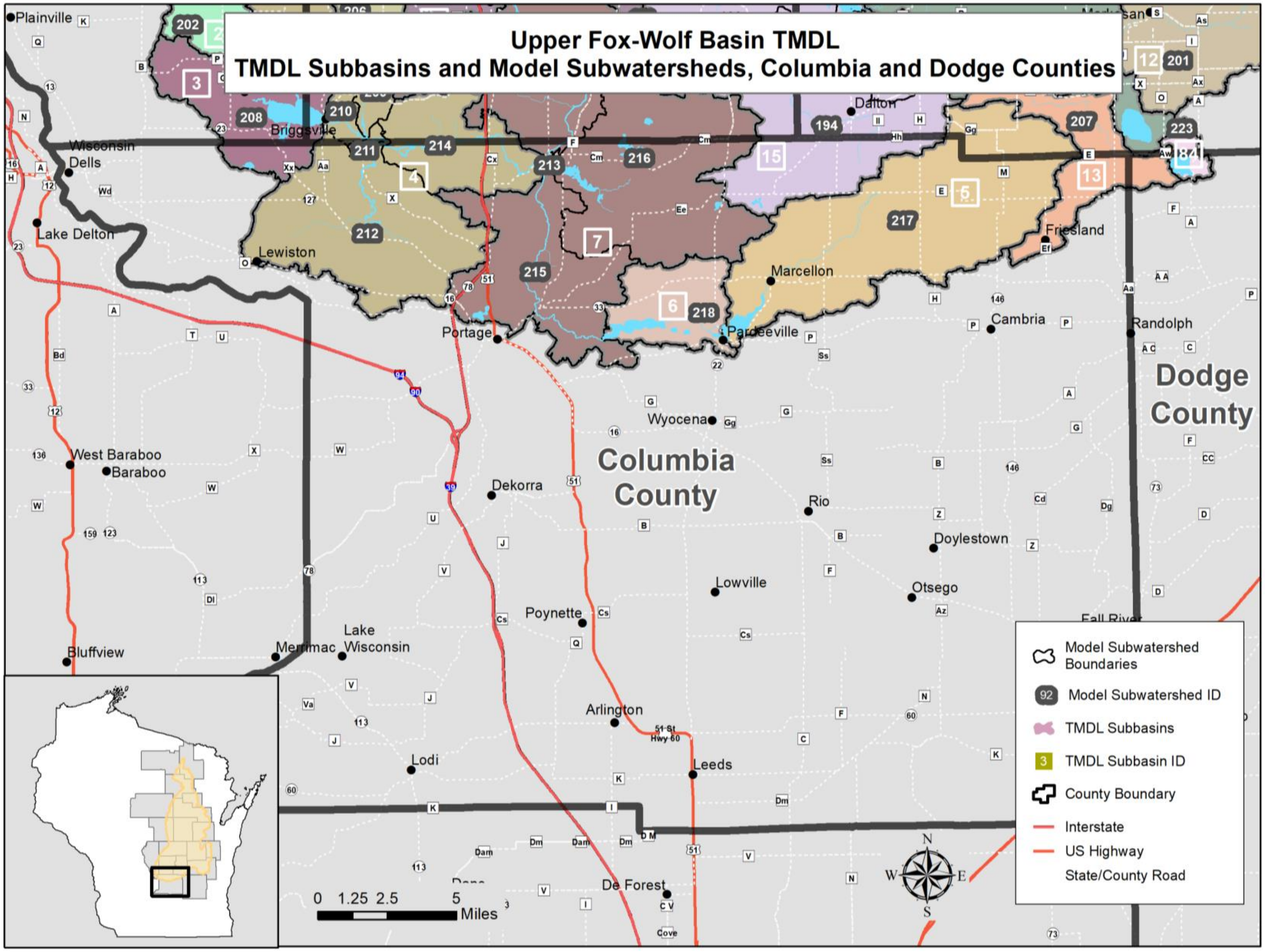
https://dnr.wi.gov/topic/surfaceWater/waterQualityTrading.html

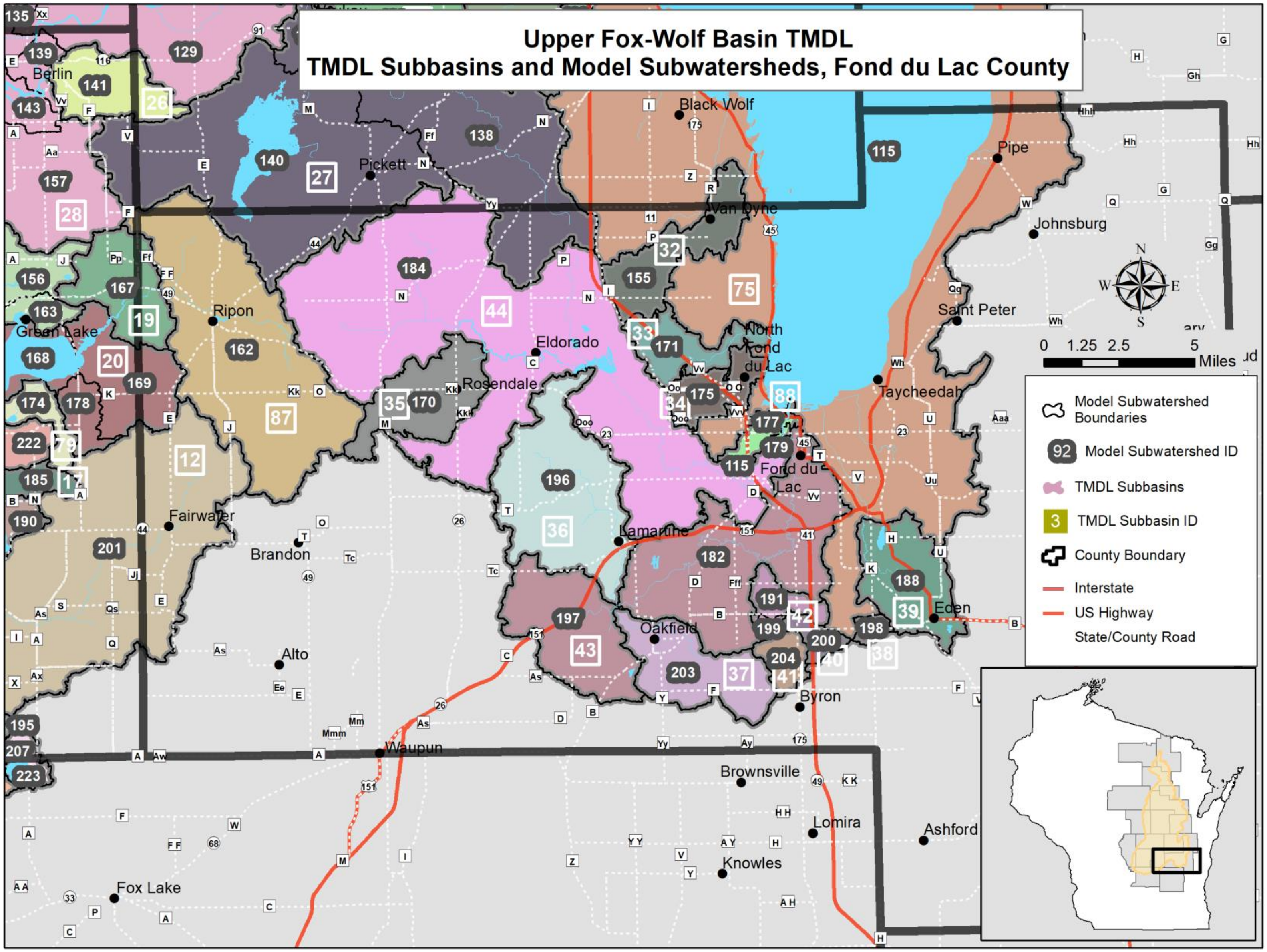
6 REFERENCES

Wisconsin Department of Natural Resources (2013a). A Water Quality Trading How To Manual: Guidance on Developing a Water Quality Trading Strategy Based on Protocols Specified in "Guidance for Implementing Water Quality Trading in WPDES Permits" (No. 3400-2013-03). http://dnr.wi.gov/topic/surfacewater/documents/WQT_howto_9_9_2013signed.pdf

Wisconsin Department of Natural Resources (2013b). Guidance for Implementing Water Quality Trading in WPDES Permits (No. 3800-2013-04). Retrieved from http://dnr.wi.gov/topic/surfacewater/documents/WQT_guidance_Aug_21_2013signed.pdf

7 TMDL SUBBASIN AND MODEL SUBWATERSHED MAPS

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TMDL Subbasins and Model Subwatersheds, Fond du Lac County
Model Subwatershed Boundaries
Model Subwatershed ID
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.25 2.5 5 Miles
Berlin
Ripon
Green Lake
Pickett
Black Wolf
Van Dyne
Eldorado
Rosendale
North Fond du Lac
Fond du Lac
Taycheedah
Saint Peter
Johnsburg
Pipe
Fairwater
Brandon
Lamartine
Oakfield
Eden
Byron
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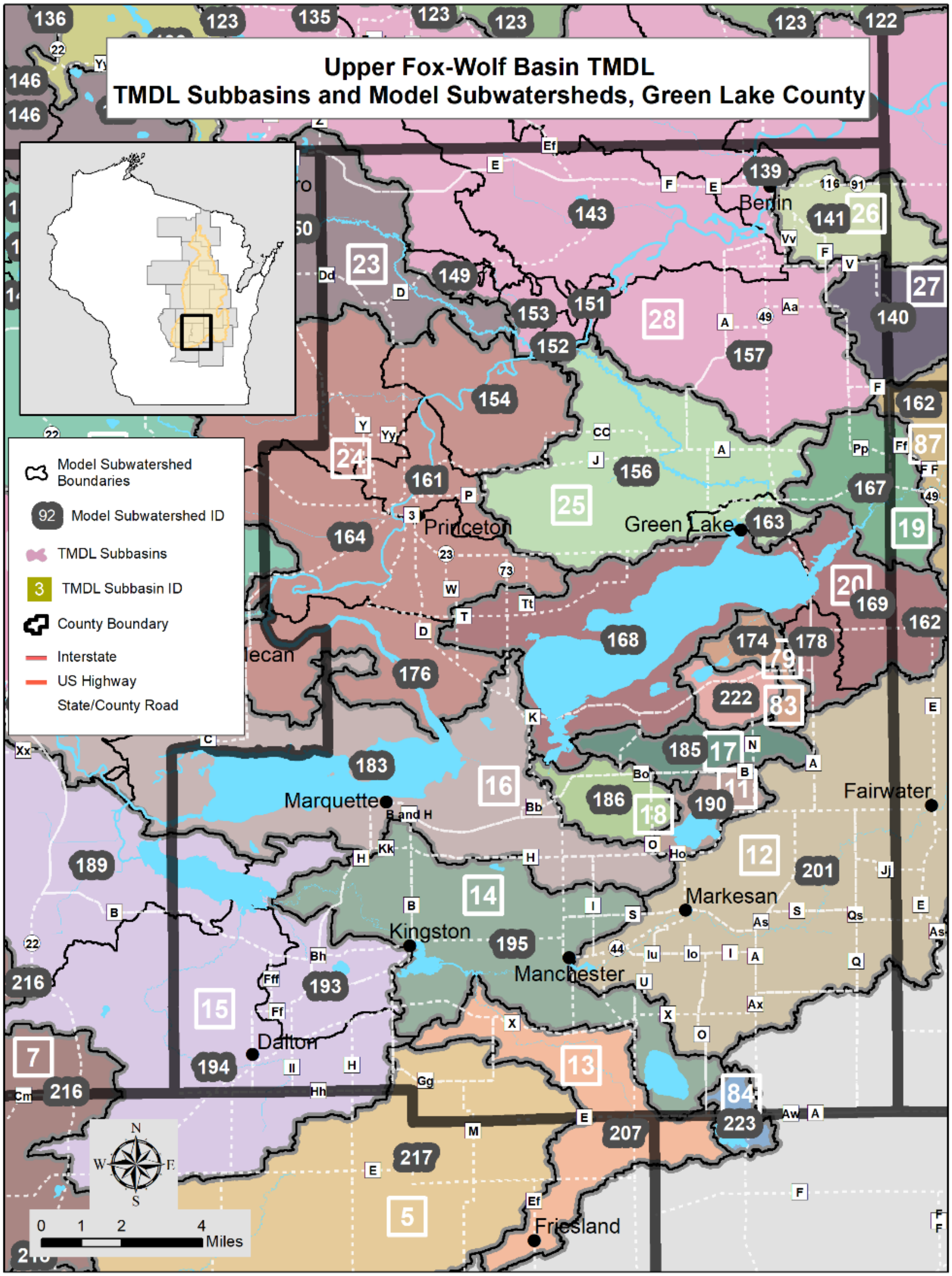
Ashford
Knowles
Fox Lake


Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Green Lake County
Model Subwatershed Boundaries
92 Model Subwatershed ID
TMDL Subbasins
3 TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
Berlin
Princeton
Green Lake
Marquette
Fairwater
Markesan
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Dalton
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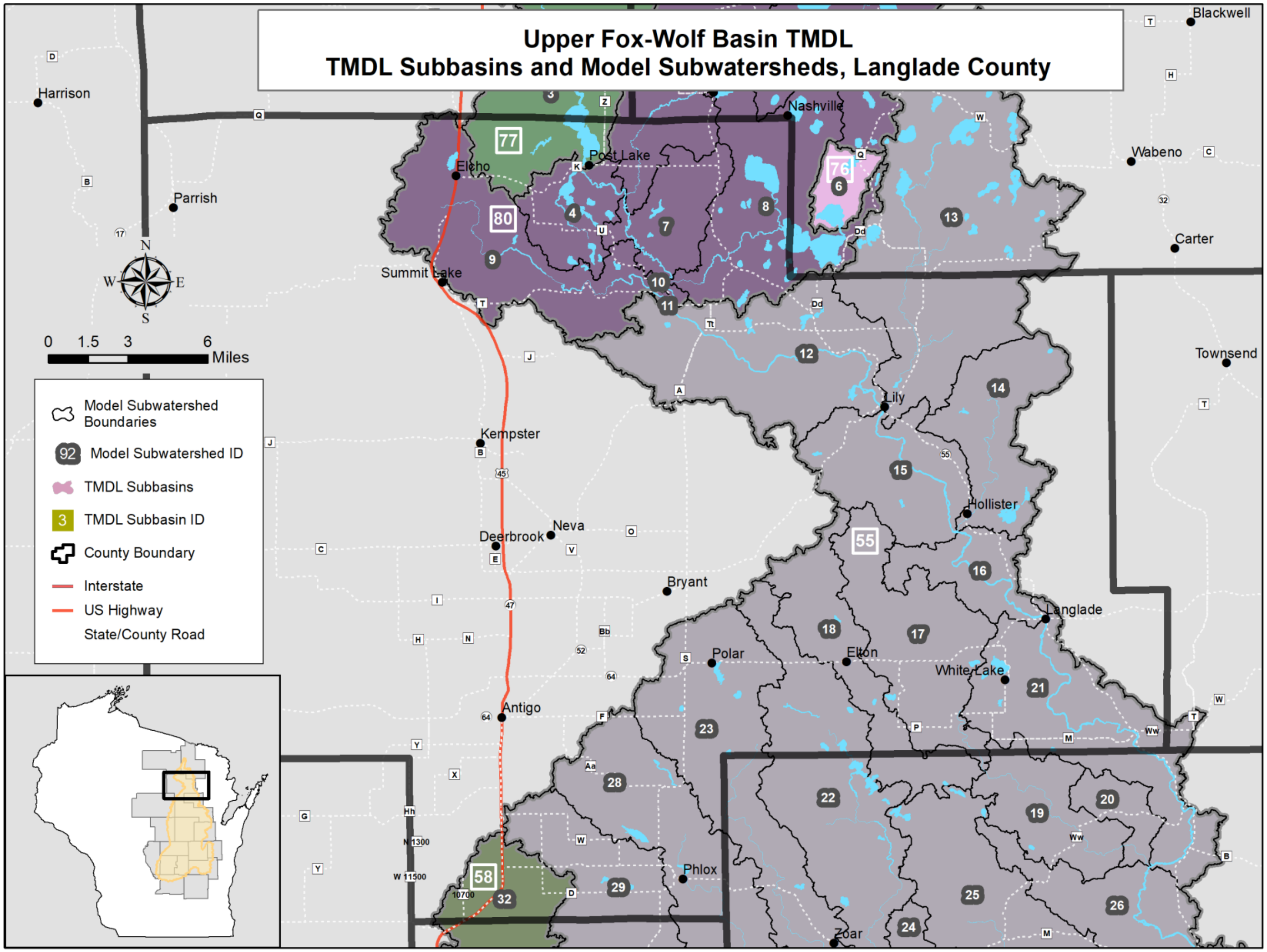
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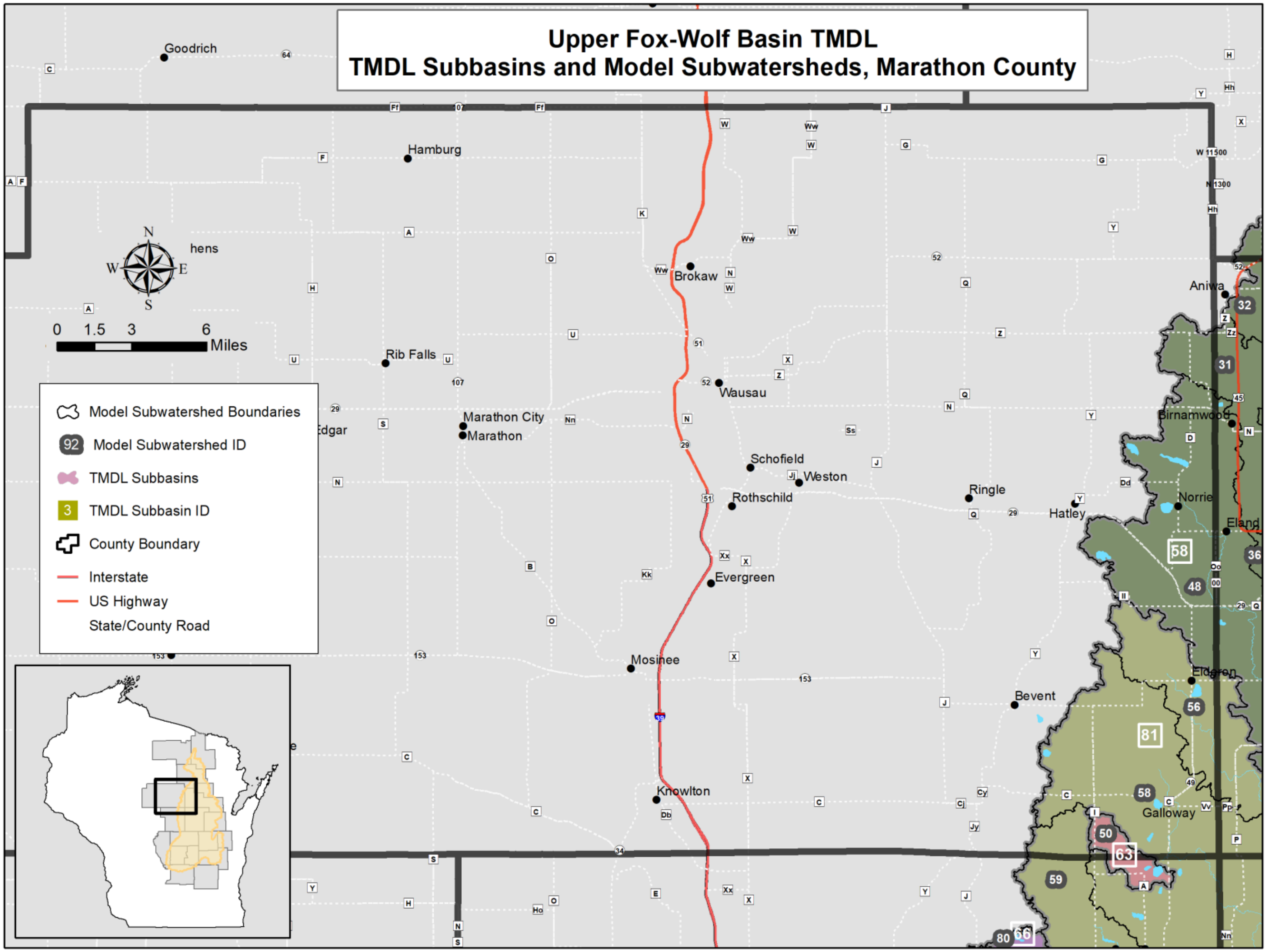
TMDL Subbasins and Model Subwatersheds, Langlade County
Model Subwatershed Boundaries
Model Subwatershed ID
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.5 3 6 Miles
Harrison
Parrish
Blackwell
Nashville
Post Lake
Elcho
Wabeno
Carter
Summit Lake
Townsend
Lily
Kempster
Hollister
Neva
Deerbrook
Bryant
Langlade
Polar
Elton
White Lake
Antigo
Phlox
Zoar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TMDL Subbasins and Model Subwatersheds, Marathon County
N
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Miles
Model Subwatershed Boundaries
92 Model Subwatershed ID
TMDL Subbasins
3 TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
Goodrich
Hamburg
Brokaw
Rib Falls
Wausau
Marathon City
Marathon
Schofield
Weston
Rothschild
Ringle
Hatley
Evergreen
Mosinee
Bevent
Knowlton
Aniwa
Birnamwood
Norrie
Eland
Eldgren
Galloway
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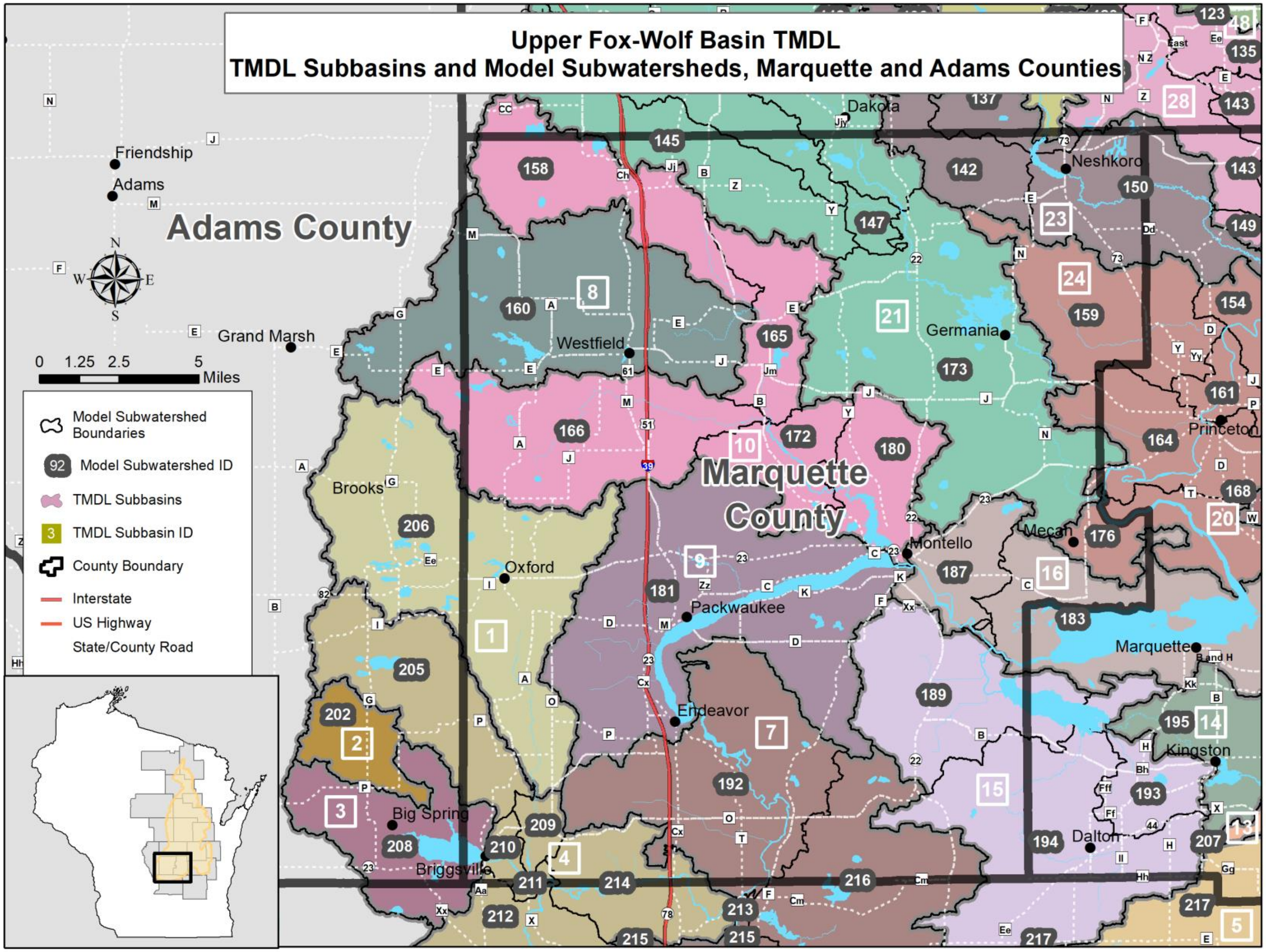
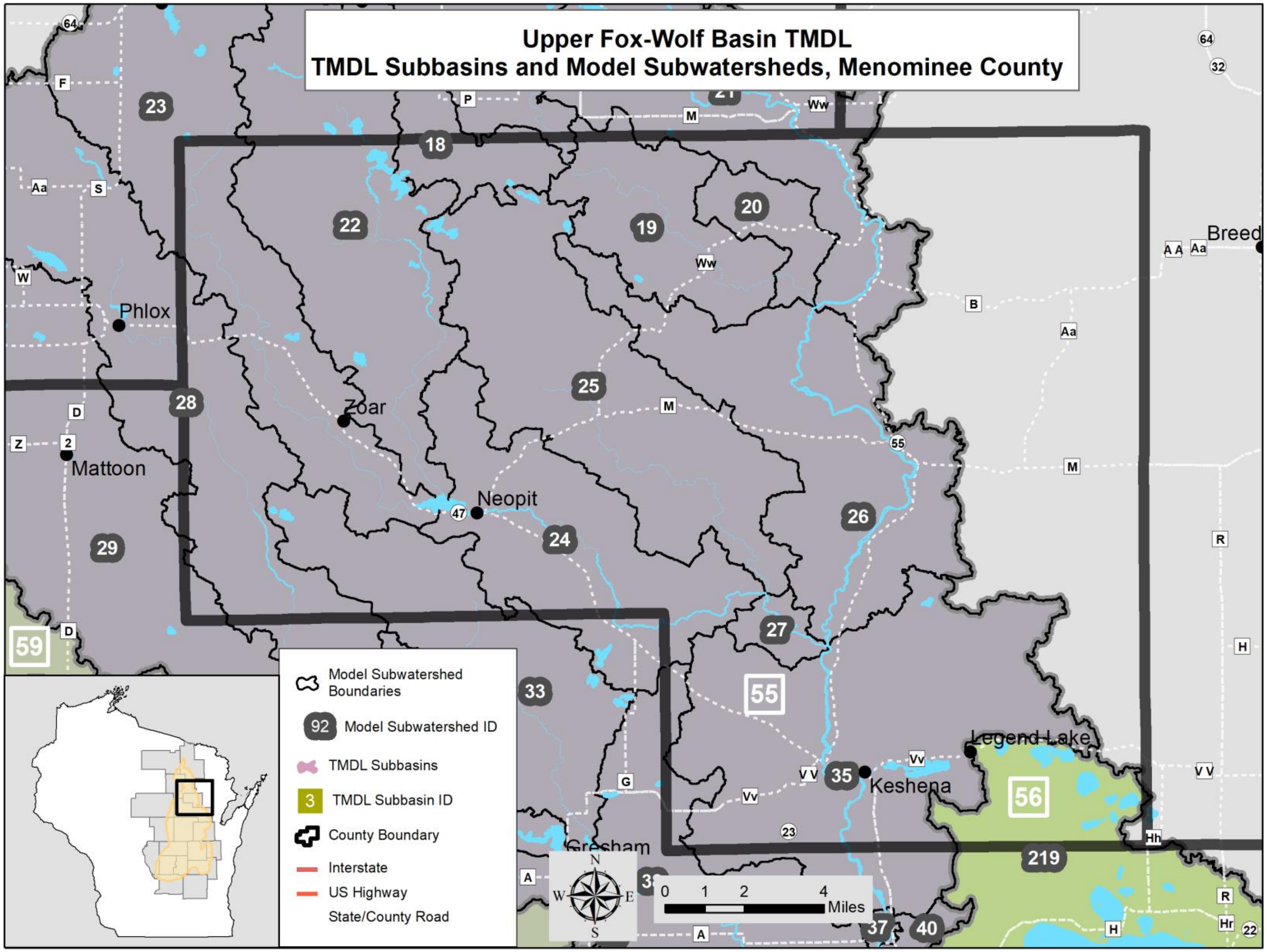
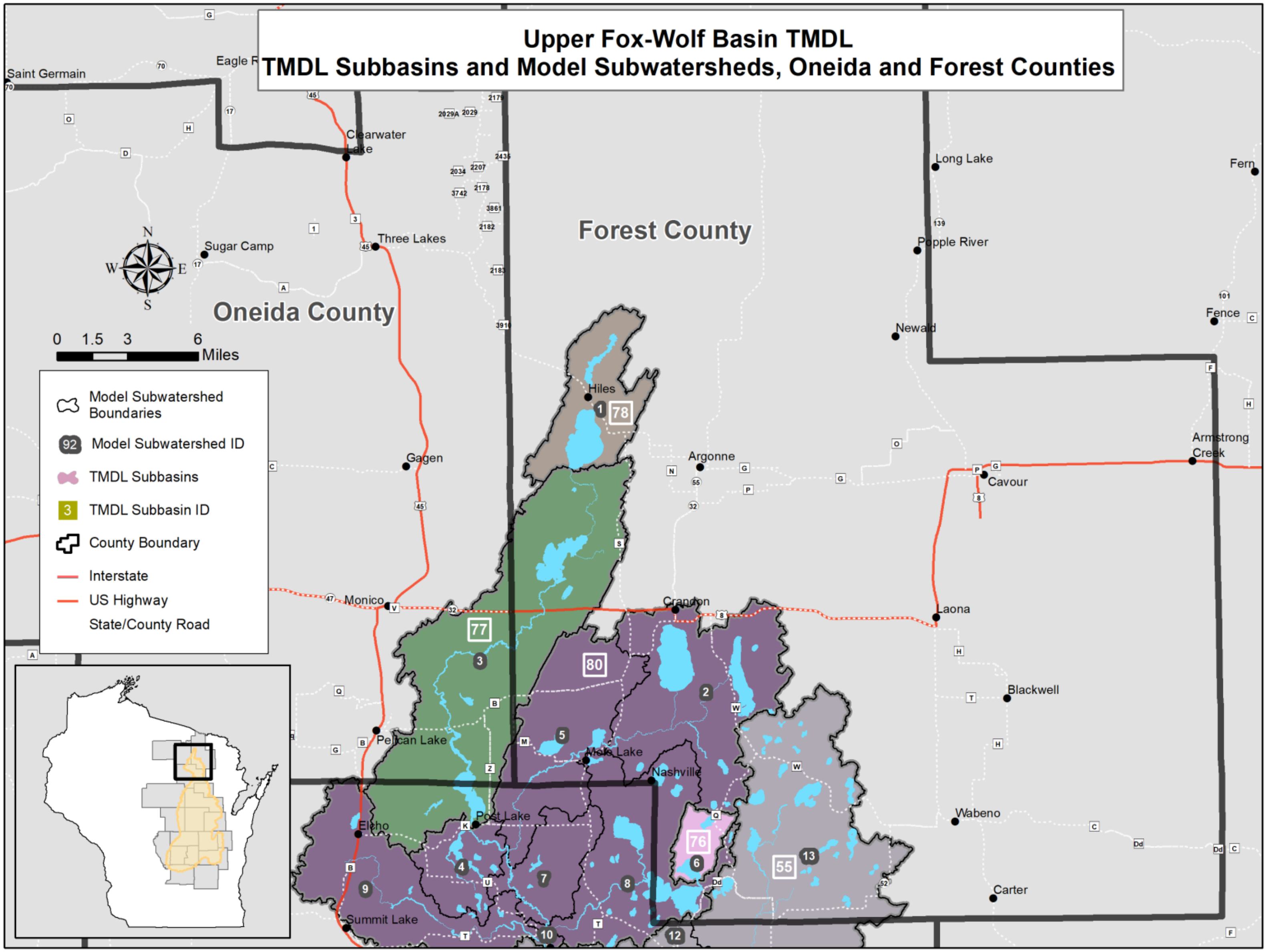

Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Marquette and Adams Counties
Adams County
Marquette County
Friendship
Adams
Grand Marsh
Brooks
Oxford
Westfield
Dakota
Neshkoro
Germania
Princeton
Montello
Mecan
Packwaukee
Marquette
Endeavor
Kingston
Big Spring
Briggsville
Dalton
0 1.25 2.5 5 Miles
Model Subwatershed Boundaries
92 Model Subwatershed ID
TMDL Subbasins
3 TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road



Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Menominee County
Model Subwatershed Boundaries
92 Model Subwatershed ID
TMDL Subbasins
3 TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1 2 4 Miles
Phlox
Zoar
Mattoon
Neopit
Keshena
Legend Lake
Breed
Gresham



Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Oneida and Forest Counties
Forest County
Oneida County
0 1.5 3 6 Miles
Model Subwatershed Boundaries
Model Subwatershed ID
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
Saint Germain
Clearwater Lake
Three Lakes
Sugar Camp
Gagen
Monico
Pelican Lake
Elcho
Summit Lake
Post Lake
Mole Lake
Nashville
Crandon
Hiles
Argonne
Long Lake
Popple River
Newald
Fern
Fence
Armstrong Creek
Cavour
Laona
Blackwell
Wabeno
Carter
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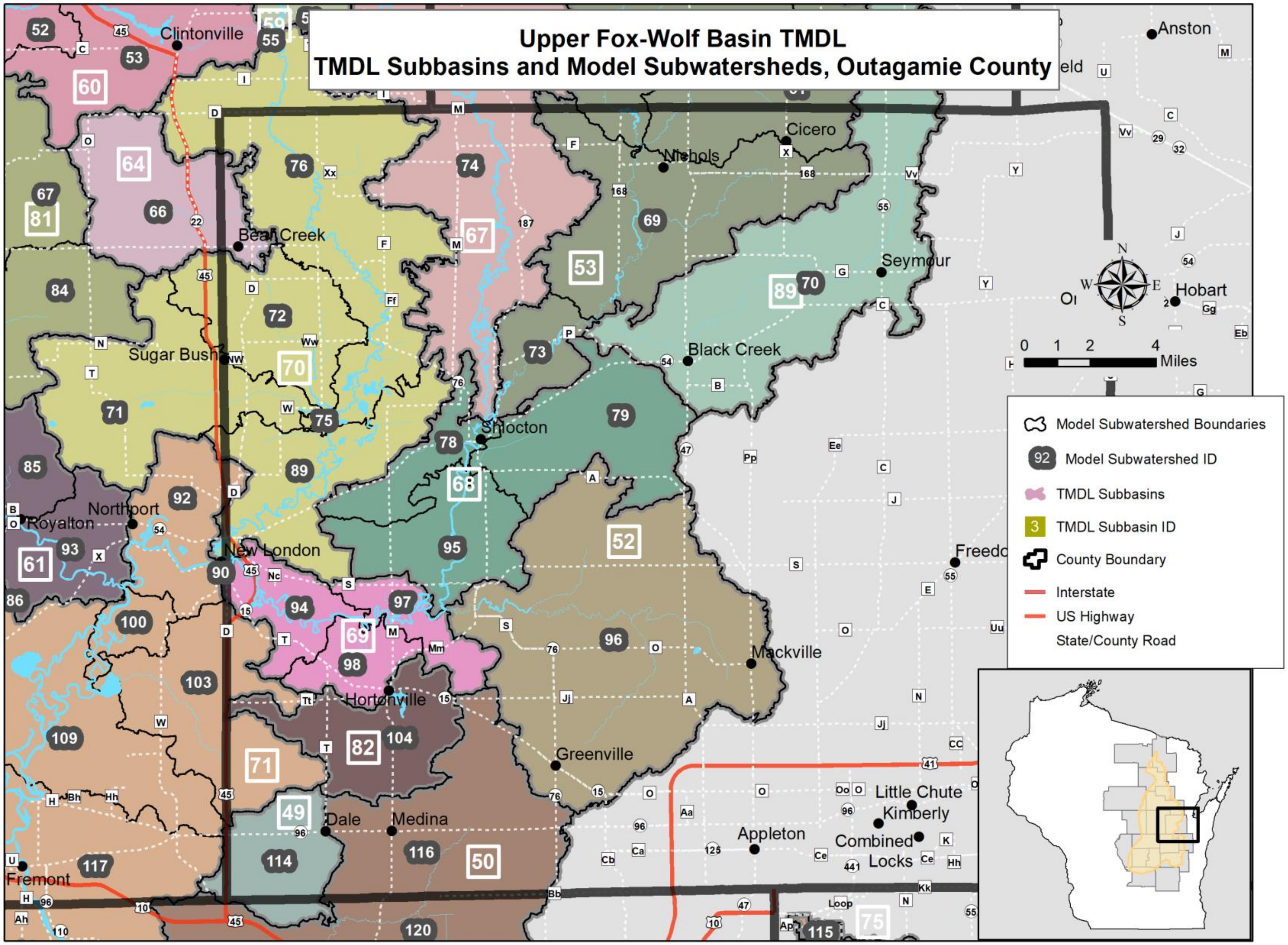
Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Outagamie County
Model Subwatershed Boundaries
Model Subwatershed ID
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1 2 4 Miles
Clintonville
Bear Creek
Sugar Bush
Northport
Royalton
New London
Shiocton
Nichols
Cicero
Seymour
Black Creek
Hortonville
Greenville
Mackville
Dale
Medina
Fremont
Appleton
Little Chute
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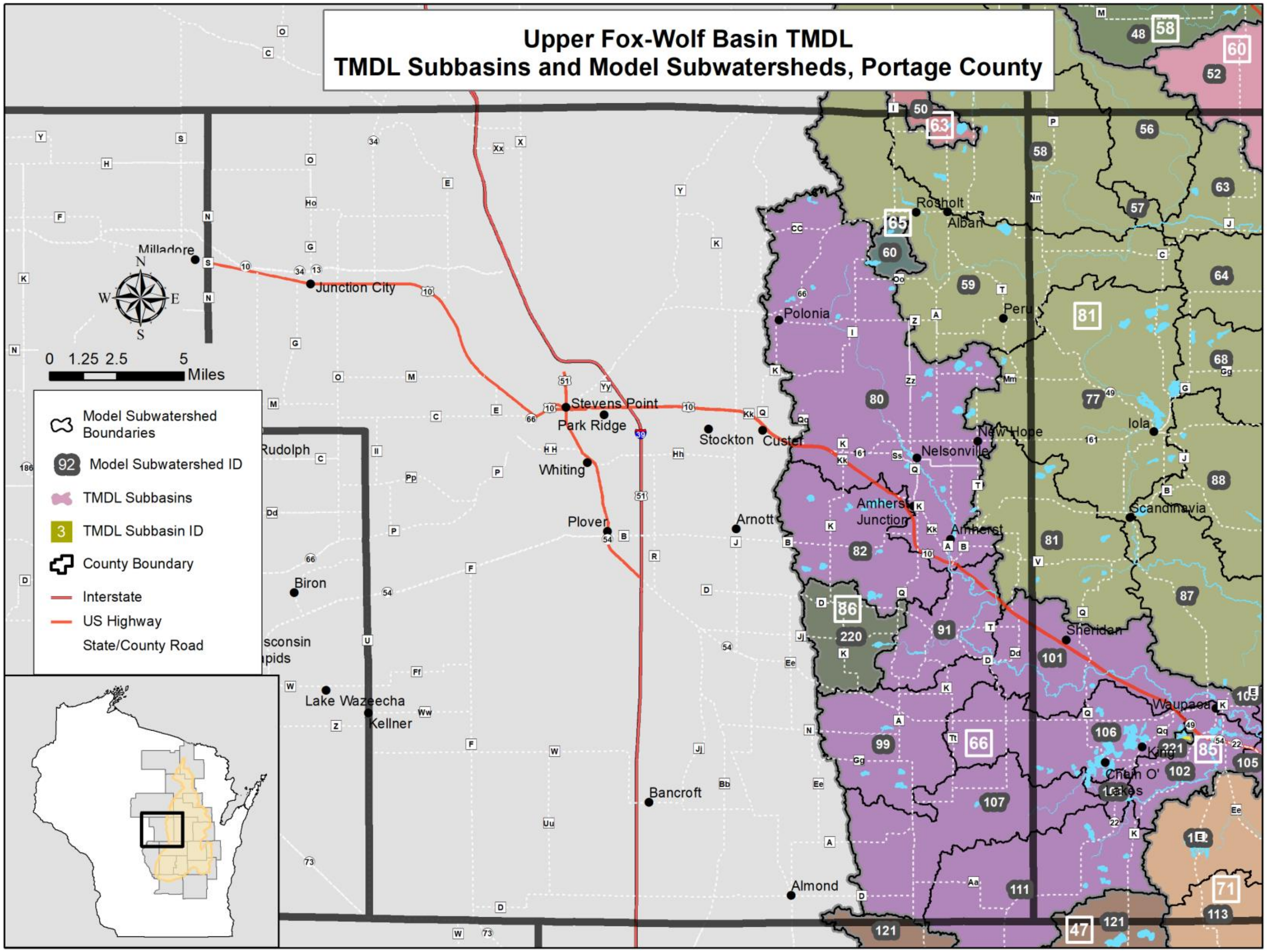
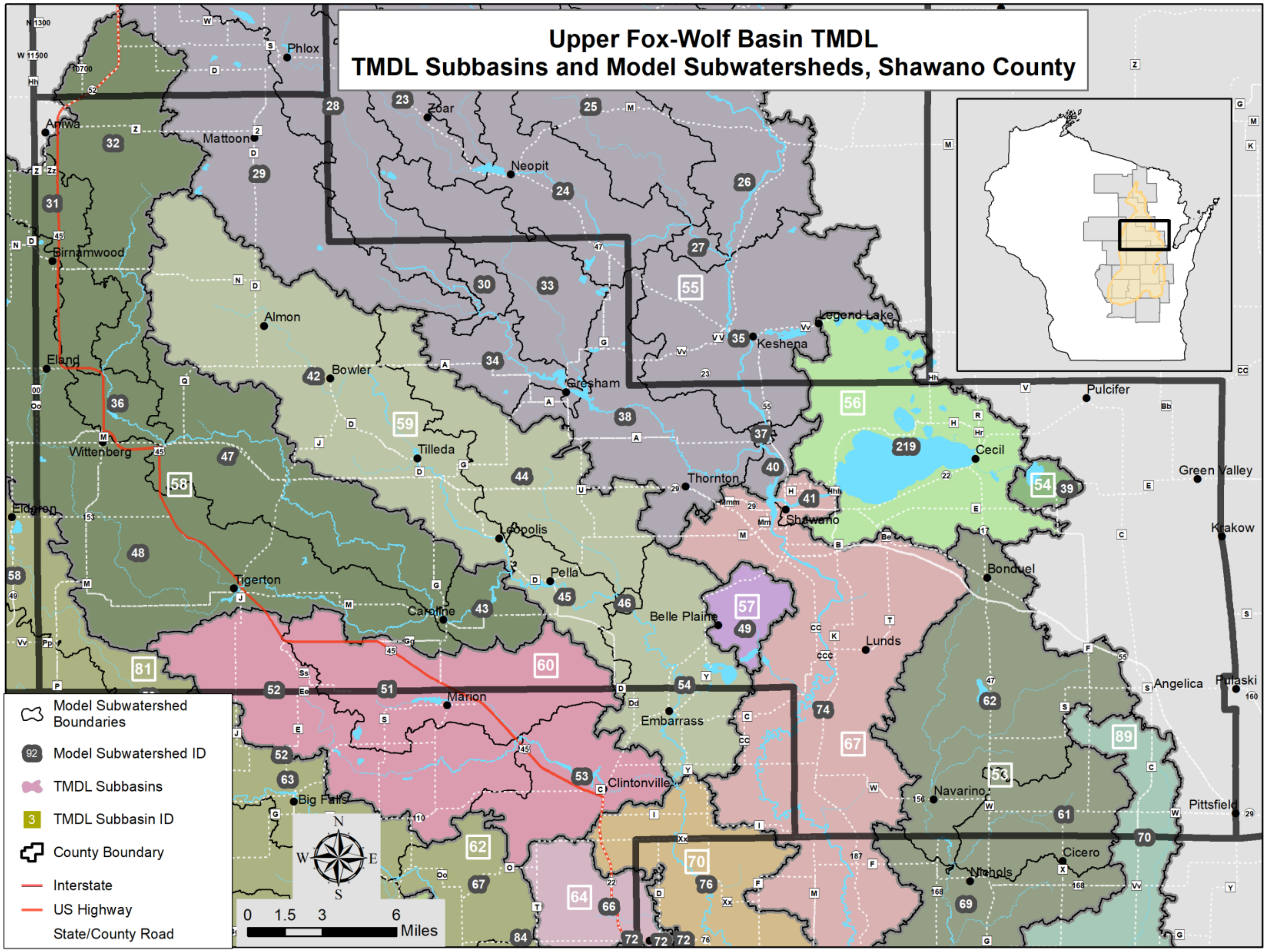
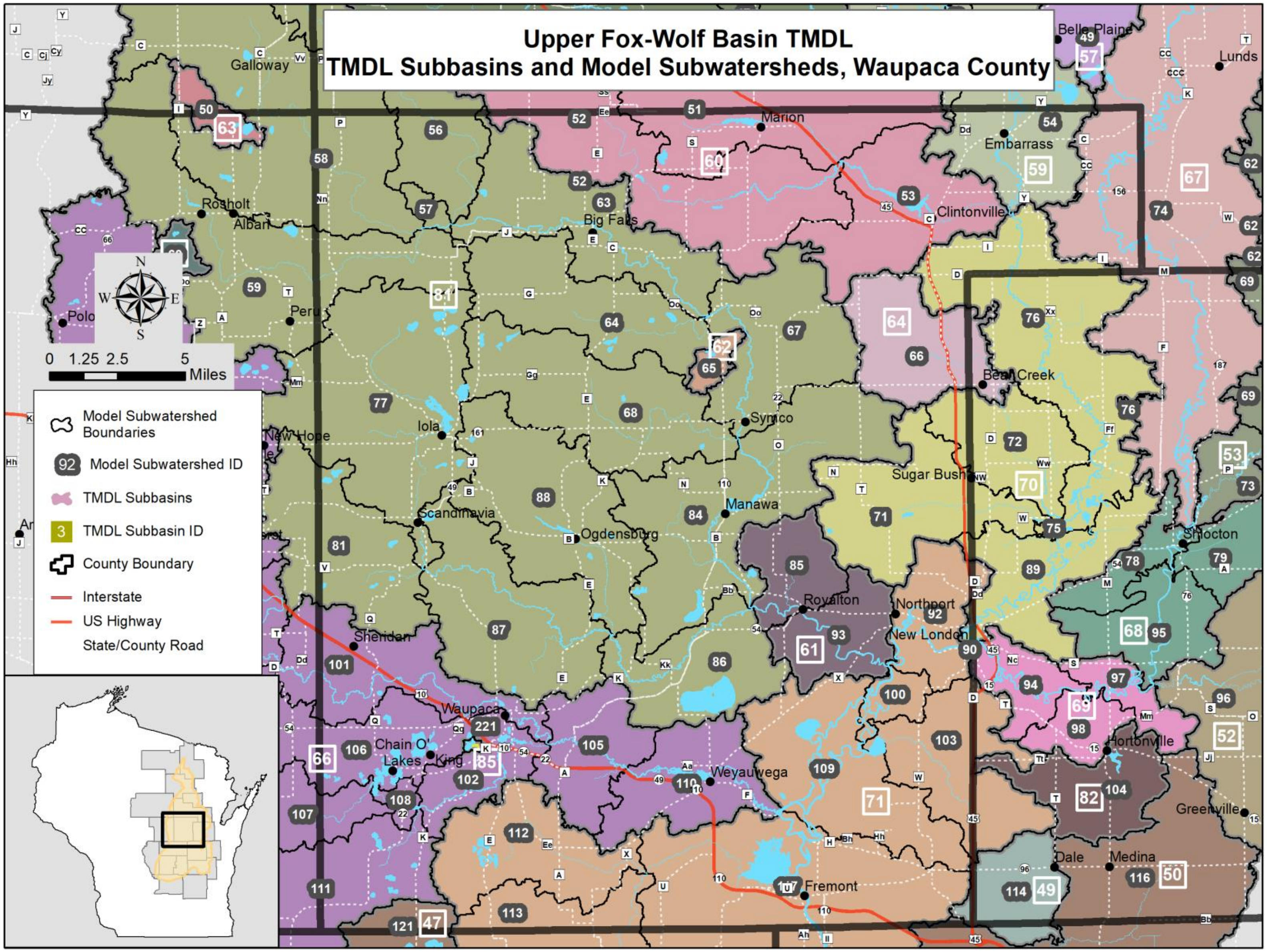
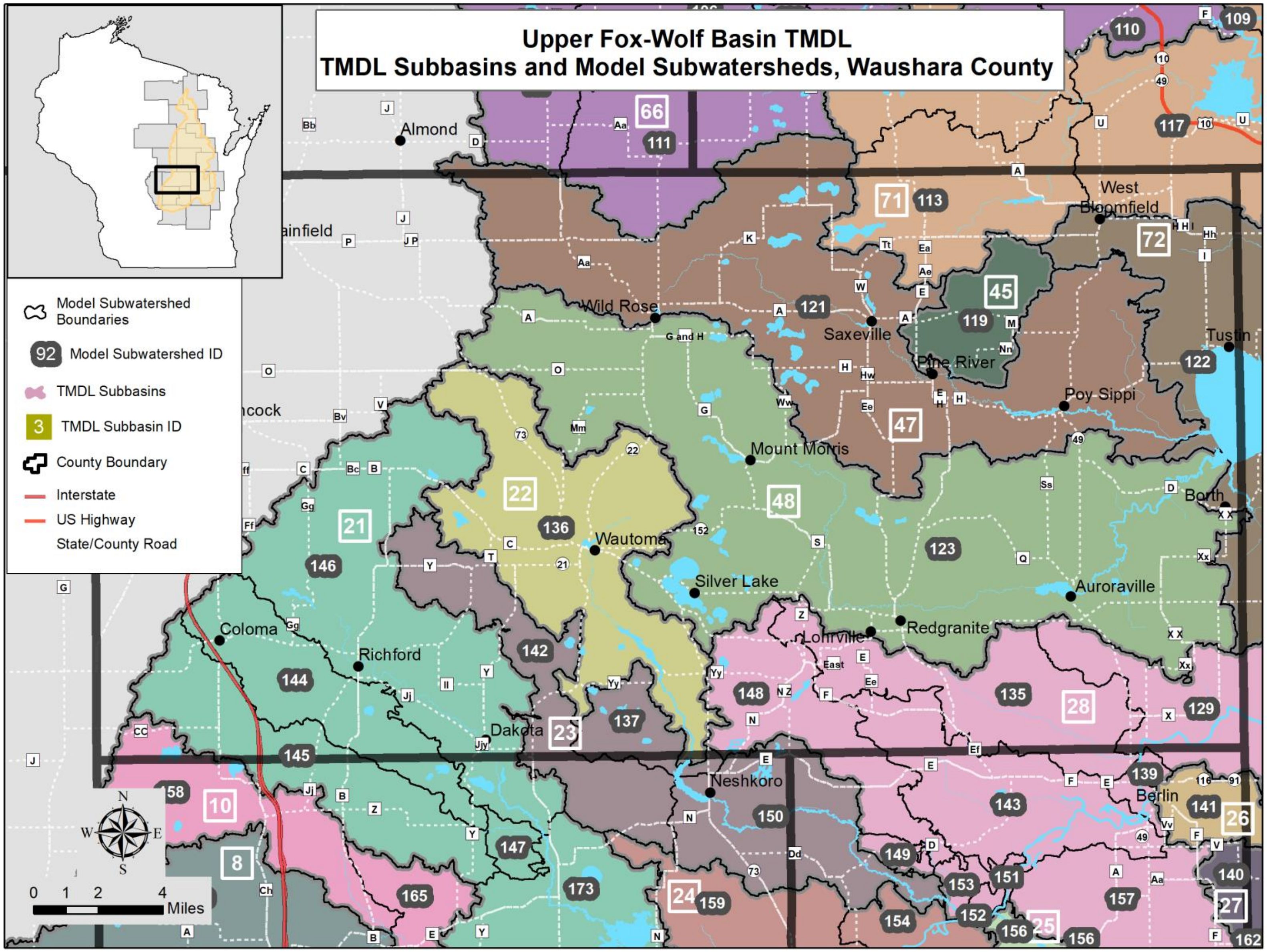
Combined Locks
Hobart
Anston



Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Portage County
0 1.25 2.5 5 Miles
Model Subwatershed Boundaries
92 Model Subwatershed ID
TMDL Subbasins
3 TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
Milladore
Junction City
Stevens Point
Park Ridge
Whiting
Plover
Stockton
Custer
Arnott
Polonia
Rosholt
Alban
Peru
Iola
New Hope
Nelsonville
Amherst Junction
Amherst
Scandinavia
Sheridan
Waupaca
King
Chain O' Lakes
Rudolph
Biron
Lake Wazeecha
Kellner
Bancroft
Almond


Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Shawano County
Model Subwatershed Boundaries
Model Subwatershed ID
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.5 3 6
Miles
N
S
E
W
Phlox
Zoar
Neopit
Mattoon
Aniwa
Birnamwood
Almon
Bowler
Eland
Wittenberg
Tilleda
Eldgren
Tigerton
Leopolis
Pella
Caroline
Marion
Big Falls
Clintonville
Embarrass
Belle Plaine
Lunds
Gresham
Keshena
Legend Lake
Thornton
Shawano
Cecil
Pulcifer
Green Valley
Krakow
Bonduel
Angelica
Pulaski
Navarino
Pittsfield
Cicero
Nichols


Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Waupaca County
Model Subwatershed Boundaries
Model Subwatershed ID
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.25 2.5 5 Miles
Galloway
Marion
Embarrass
Clintonville
Big Falls
Rosholt
Iola
Scandinavia
Ogdensburg
Manawa
Symco
Sugar Bush
Bear Creek
Royalton
Northport
New London
Shiocton
Sheridan
Waupaca
Chain O' Lakes
King
Weyauwega
Hortonville
Greenville
Dale
Medina
Fremont
Belle Plaine
Lunds
Peru
Polo
Alban
New Hope


Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Waushara County
Model Subwatershed Boundaries
92 Model Subwatershed ID
TMDL Subbasins
3 TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1 2 4 Miles
N S E W
Almond
Wild Rose
Saxeville
Pine River
Poy Sippi
West Bloomfield
Tustin
Mount Morris
Wautoma
Silver Lake
Redgranite
Lohrville
Auroraville
Berlin
Coloma
Richford
Dakota
Neshkoro
66
71
72
45
47
48
22
21
23
28
10
8
24
25
26
27
109
110
111
113
117
119
121
122
123
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135
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139
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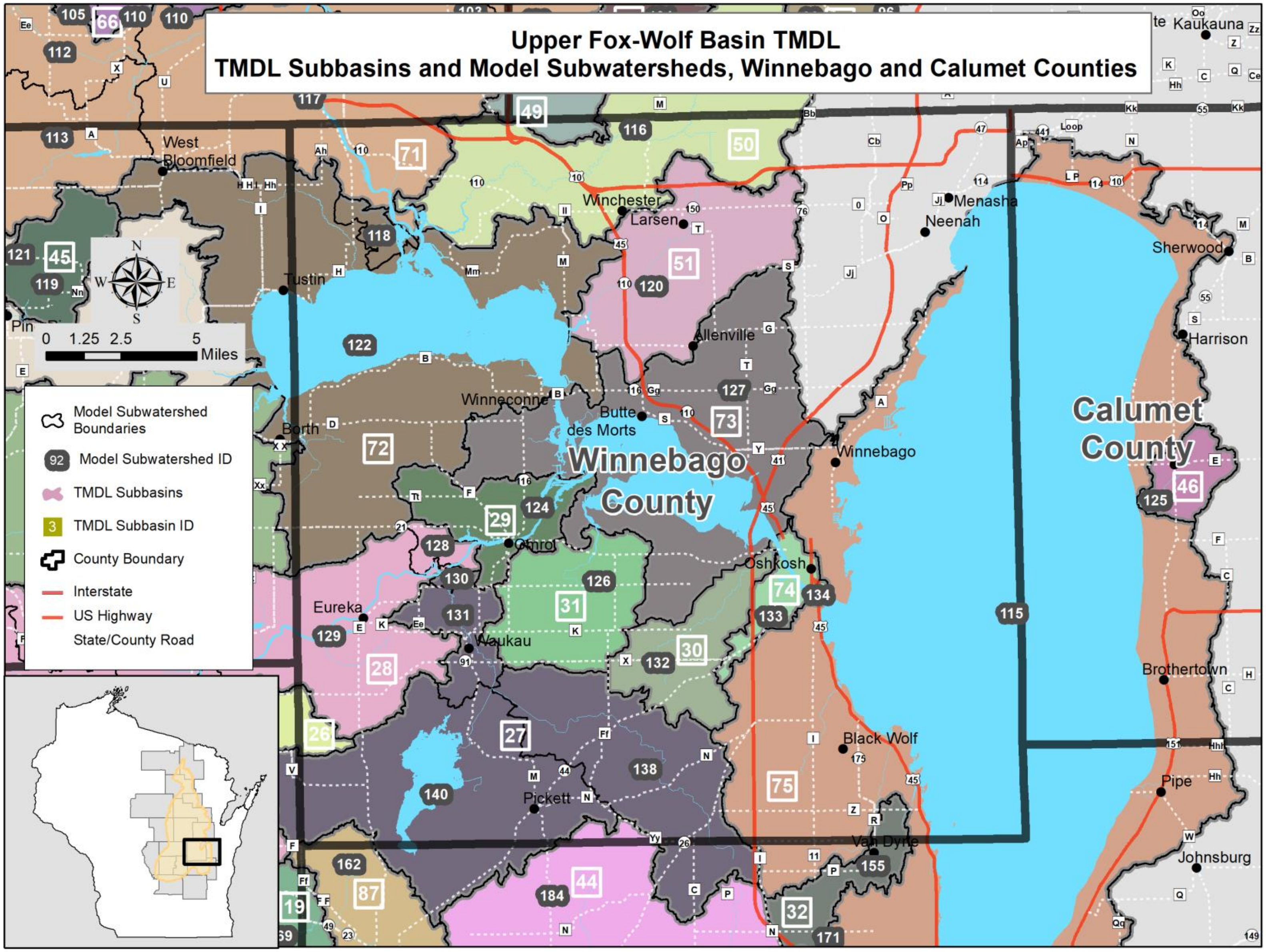
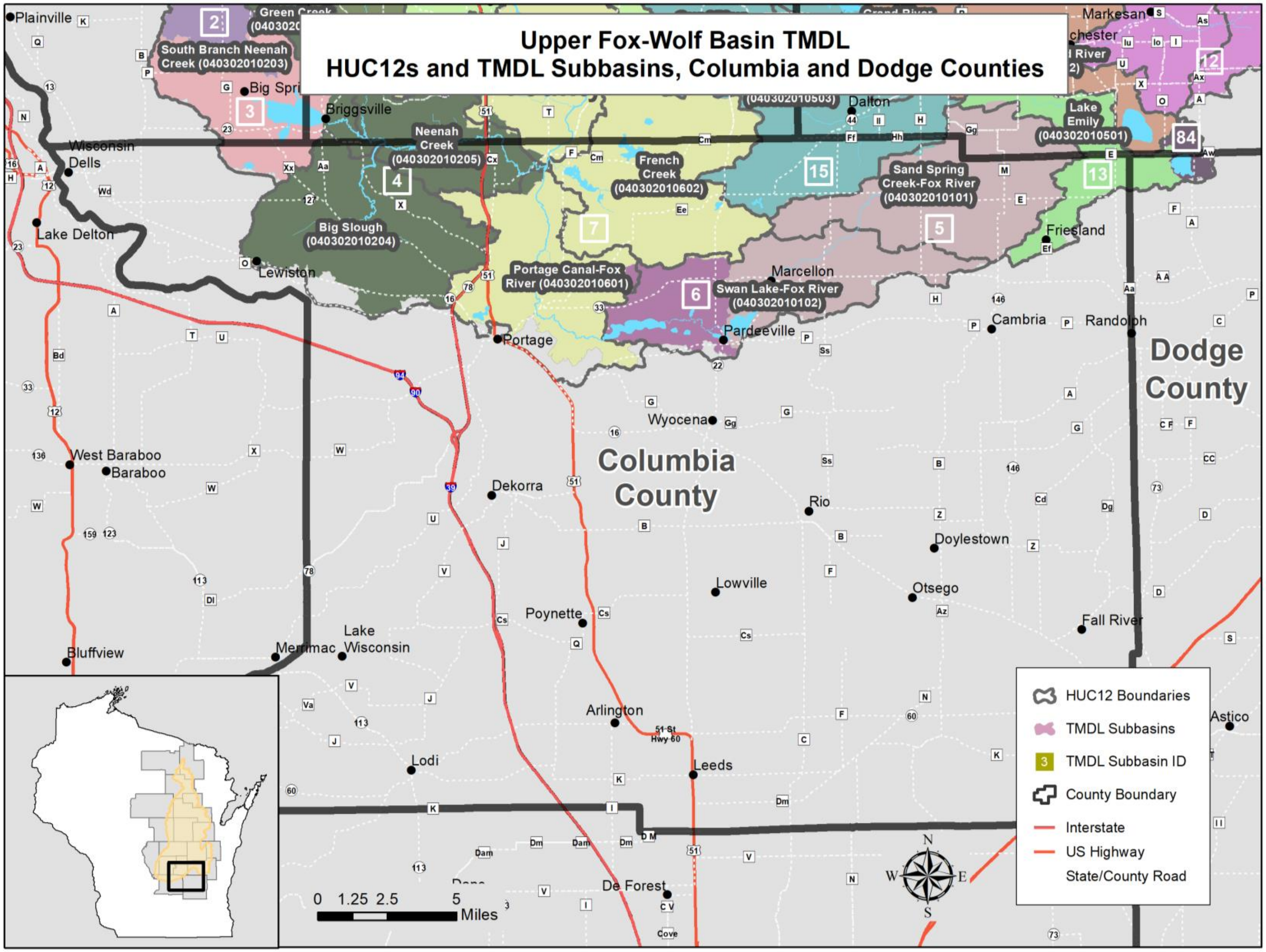
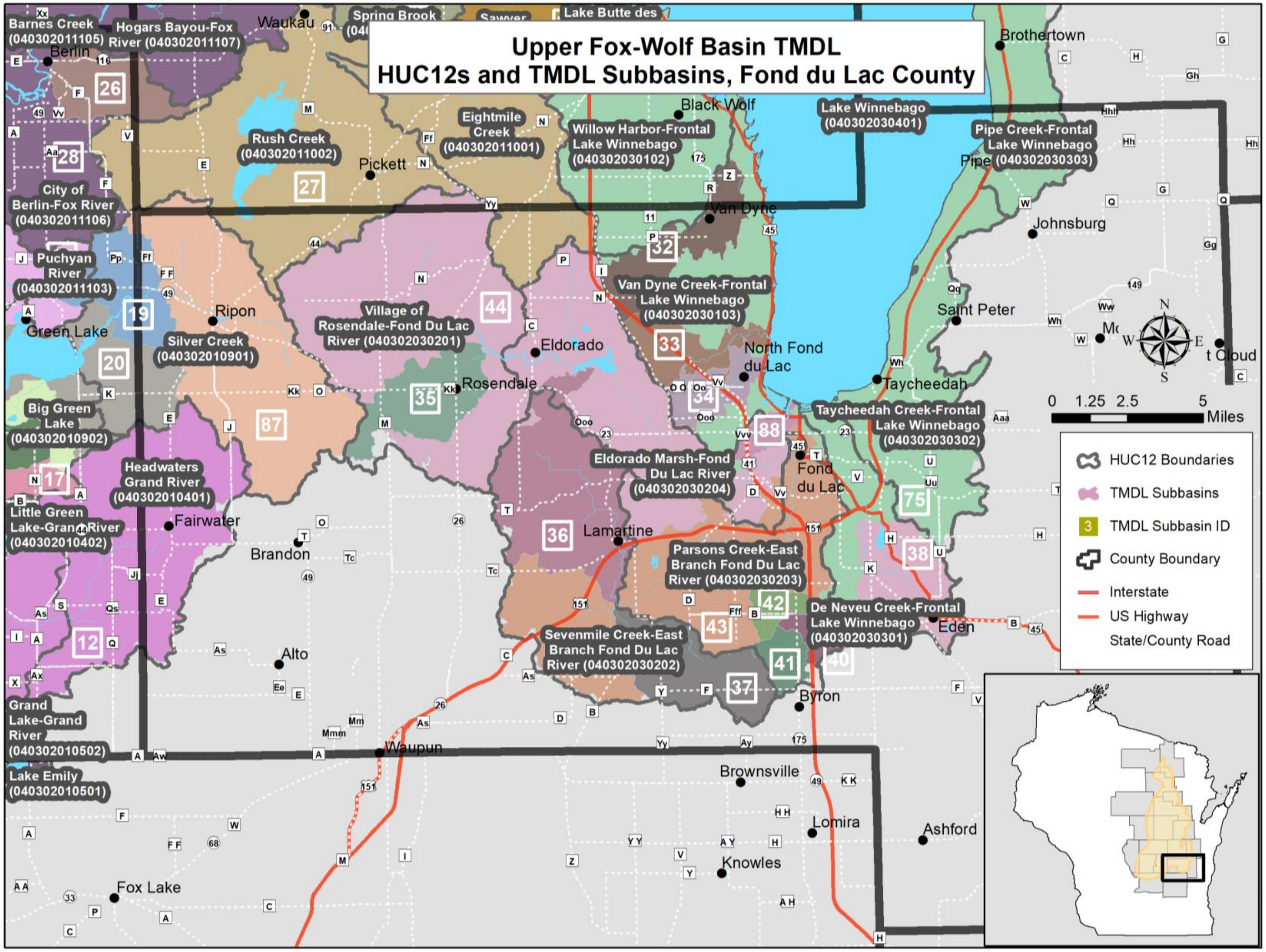
173

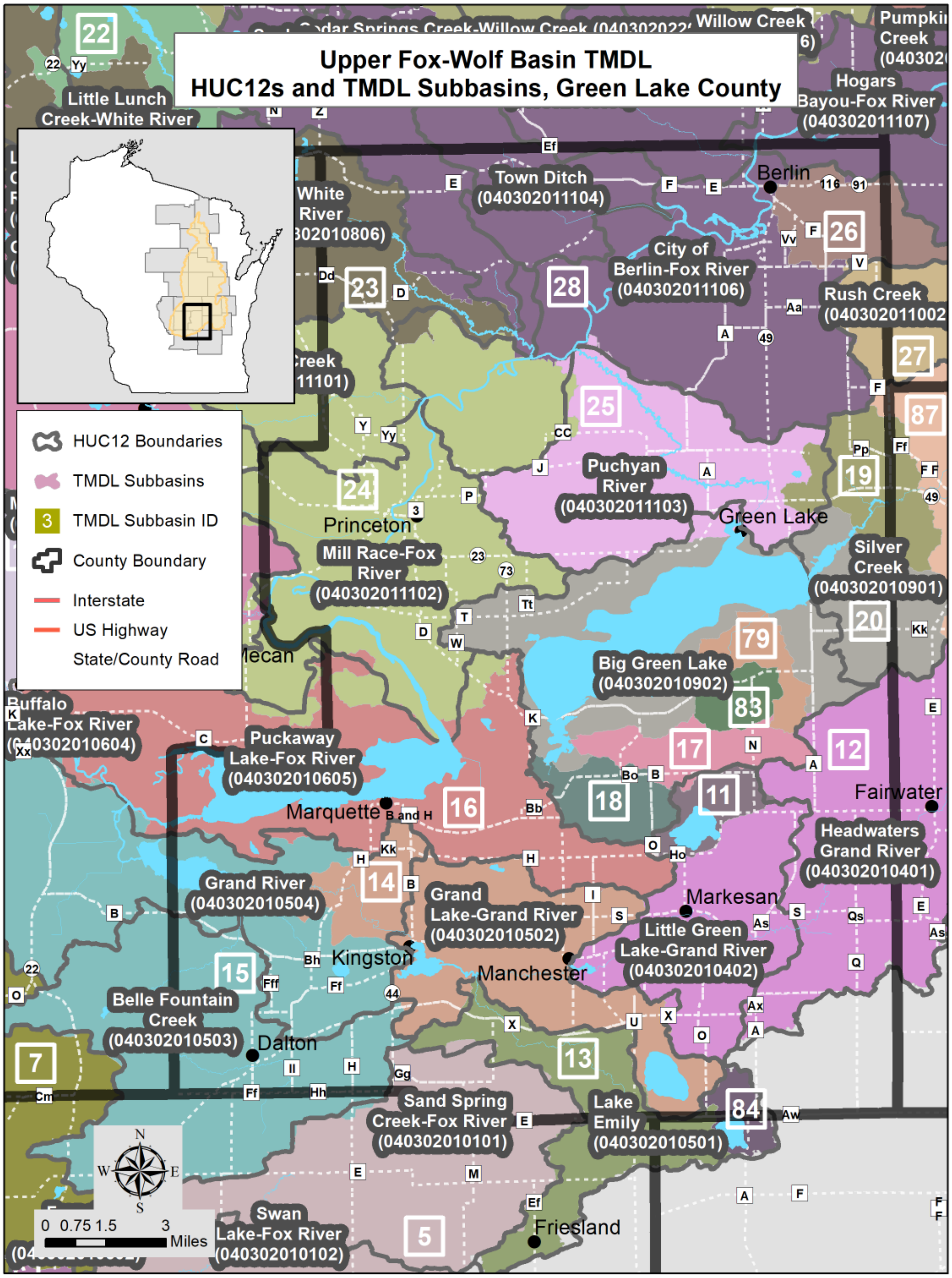

Upper Fox-Wolf Basin TMDL
TMDL Subbasins and Model Subwatersheds, Winnebago and Calumet Counties
Model Subwatershed Boundaries
Model Subwatershed ID
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.25 2.5 5 Miles
Winnebago County
Calumet County
West Bloomfield
Tustin
Winneconne
Butte des Morts
Winchester
Larsen
Allenville
Menasha
Neenah
Winnebago
Oshkosh
Omro
Eureka
Waukau
Pickett
Black Wolf
Van Dyne
Sherwood
Harrison
Brothertown
Pipe
Johnsburg
Kaukauna

8 HUC12 AND TMDL SUBBASIN MAPS

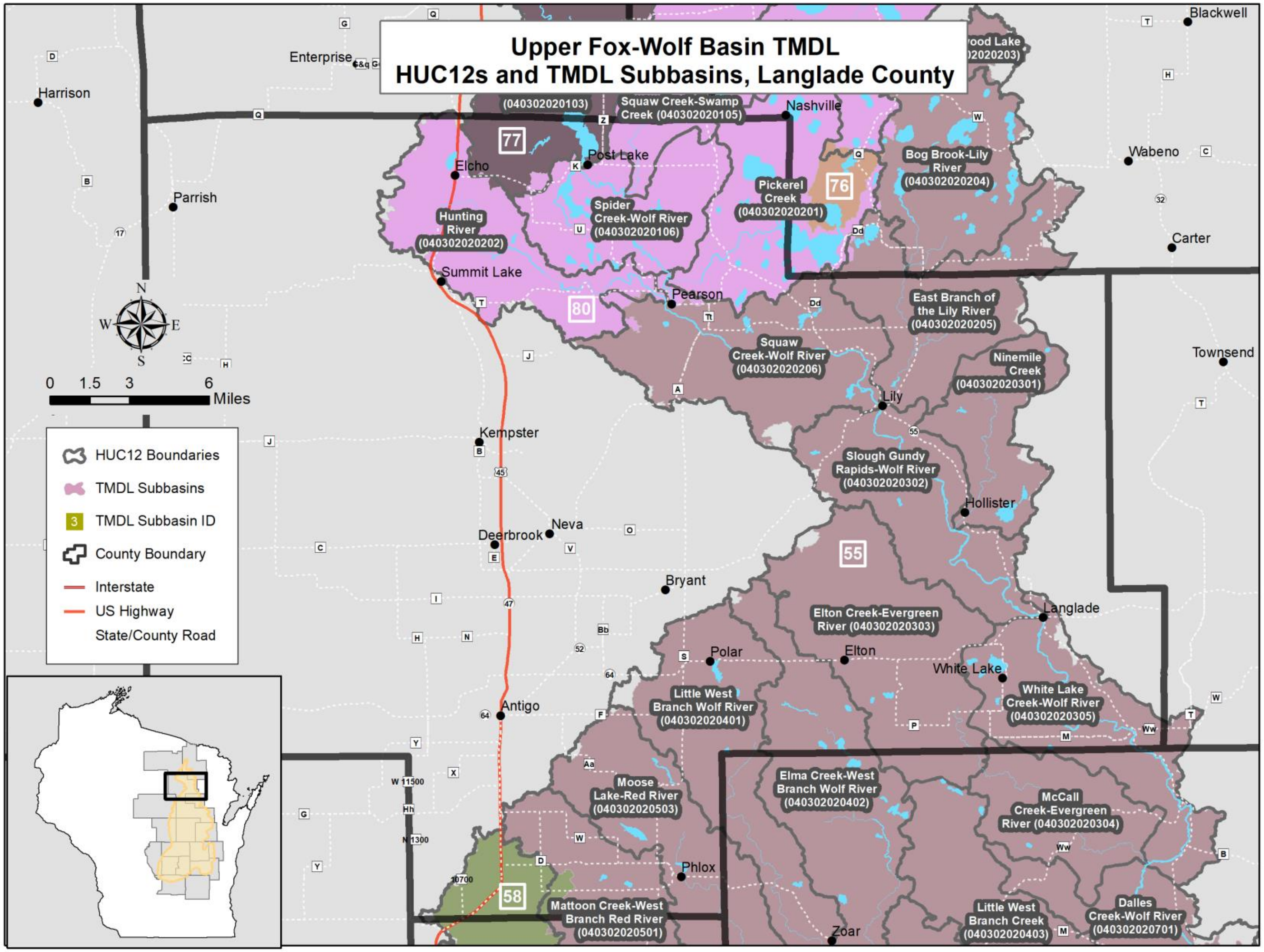


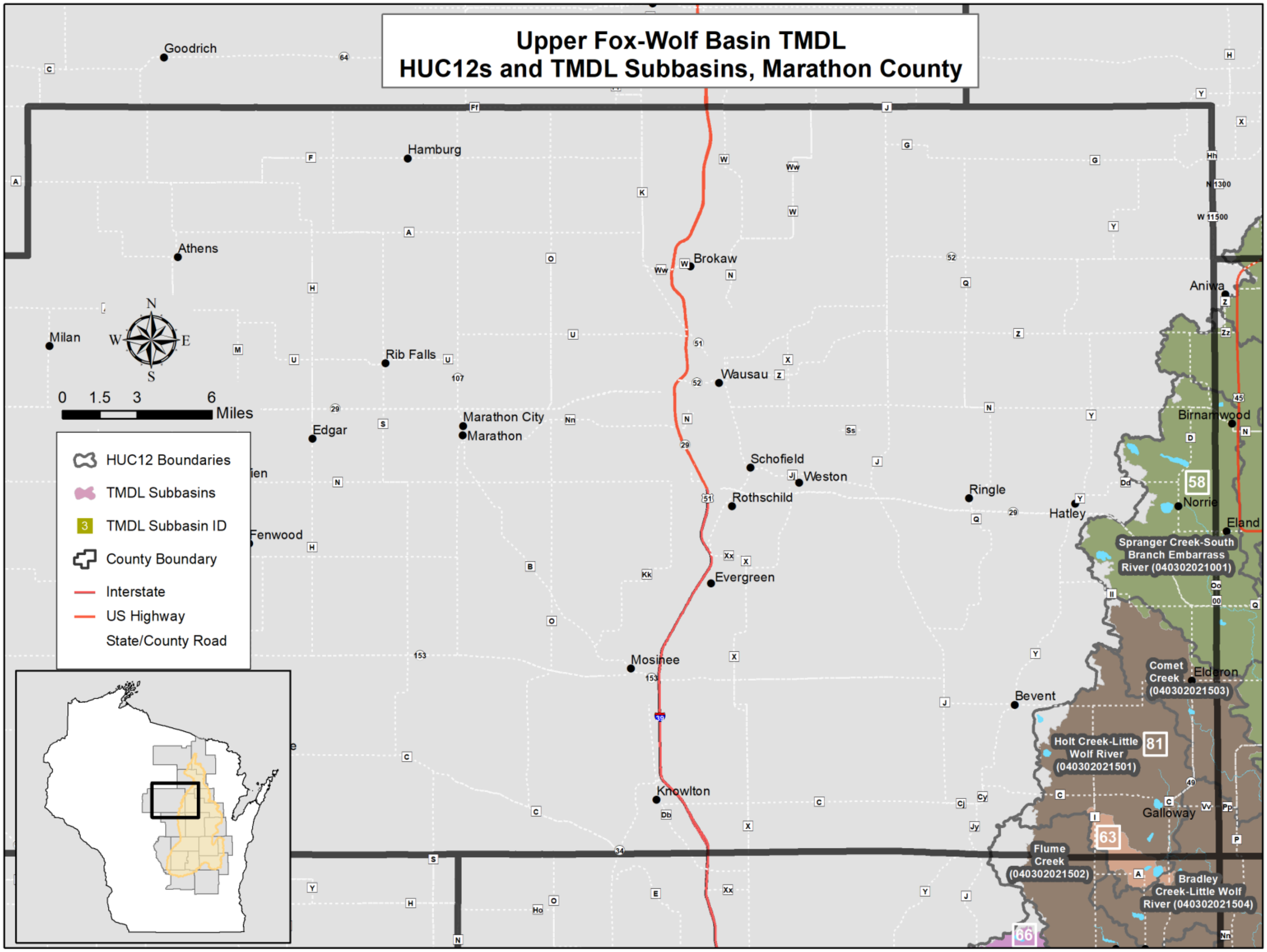


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Fond du Lac County
Barnes Creek (040302011105)
Hogars Bayou-Fox River (040302011107)
Rush Creek (040302011002)
Eightmile Creek (040302011001)
Willow Harbor-Frontal Lake Winnebago (040302030102)
Lake Winnebago (040302030401)
Pipe Creek-Frontal Lake Winnebago (040302030303)
City of Berlin-Fox River (040302011106)
Puchyan River (040302011103)
Village of Rosendale-Fond Du Lac River (040302030201)
Van Dyne Creek-Frontal Lake Winnebago (040302030103)
Silver Creek (040302010901)
Big Green Lake (040302010902)
Taycheedah Creek-Frontal Lake Winnebago (040302030302)
Eldorado Marsh-Fond Du Lac River (040302030204)
Headwaters Grand River (040302010401)
Little Green Lake-Grand River (040302010402)
Parsons Creek-East Branch Fond Du Lac River (040302030203)
De Neveu Creek-Frontal Lake Winnebago (040302030301)
Sevenmile Creek-East Branch Fond Du Lac River (040302030202)
Grand Lake-Grand River (040302010502)
Lake Emily (040302010501)
Berlin
Waukau
Pickett
Black Wolf
Van Dyne
Brothertown
Johnsburg
Saint Peter
Ripon
Green Lake
Eldorado
Rosendale
North Fond du Lac
Taycheedah
Fond du Lac
Fairwater
Brandon
Lamartine
Eden
Alto
Byron
Waupun
Brownsville
Lomira
Ashford
Knowles
Fox Lake
0 1.25 2.5 5 Miles
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road

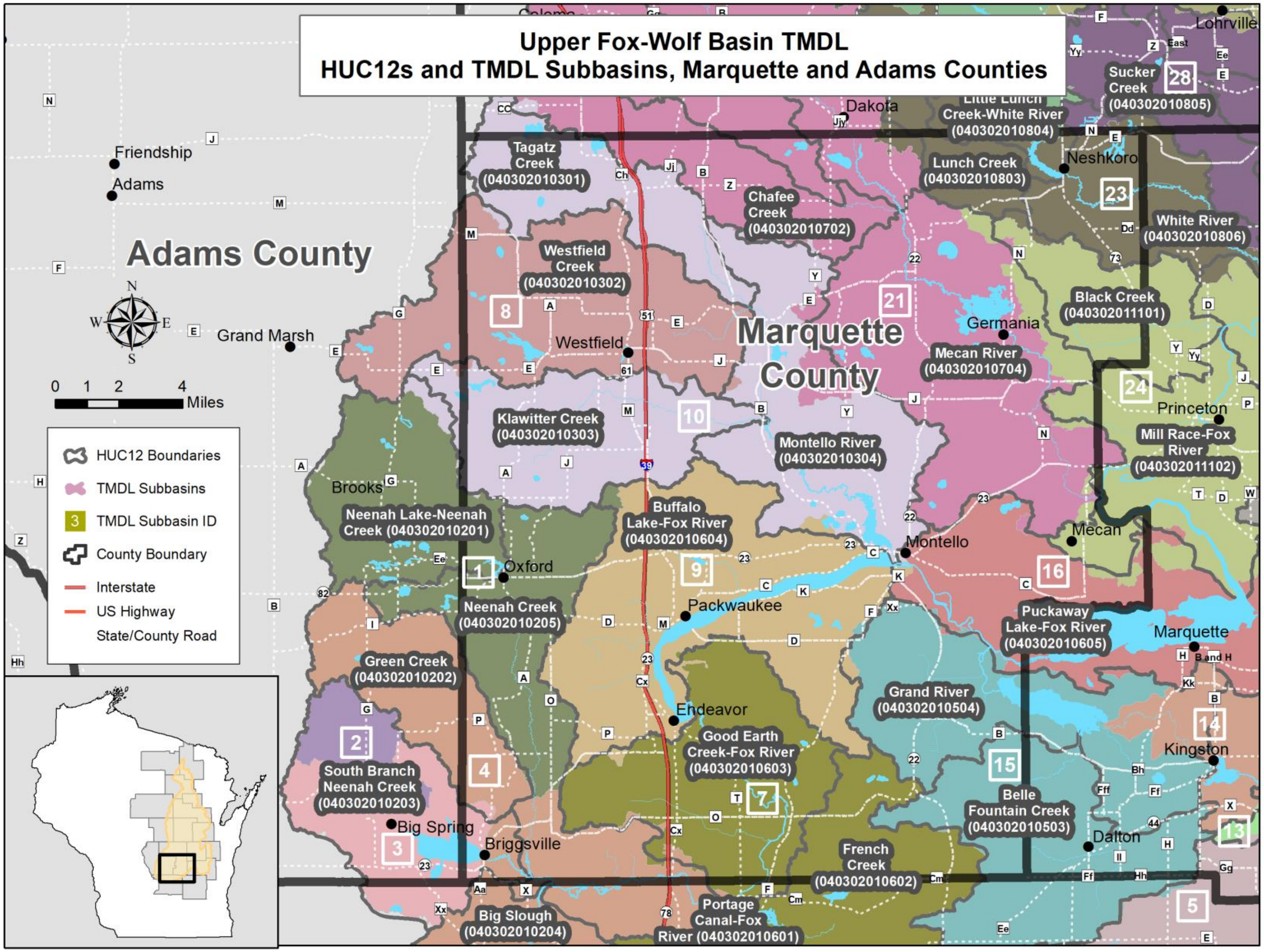


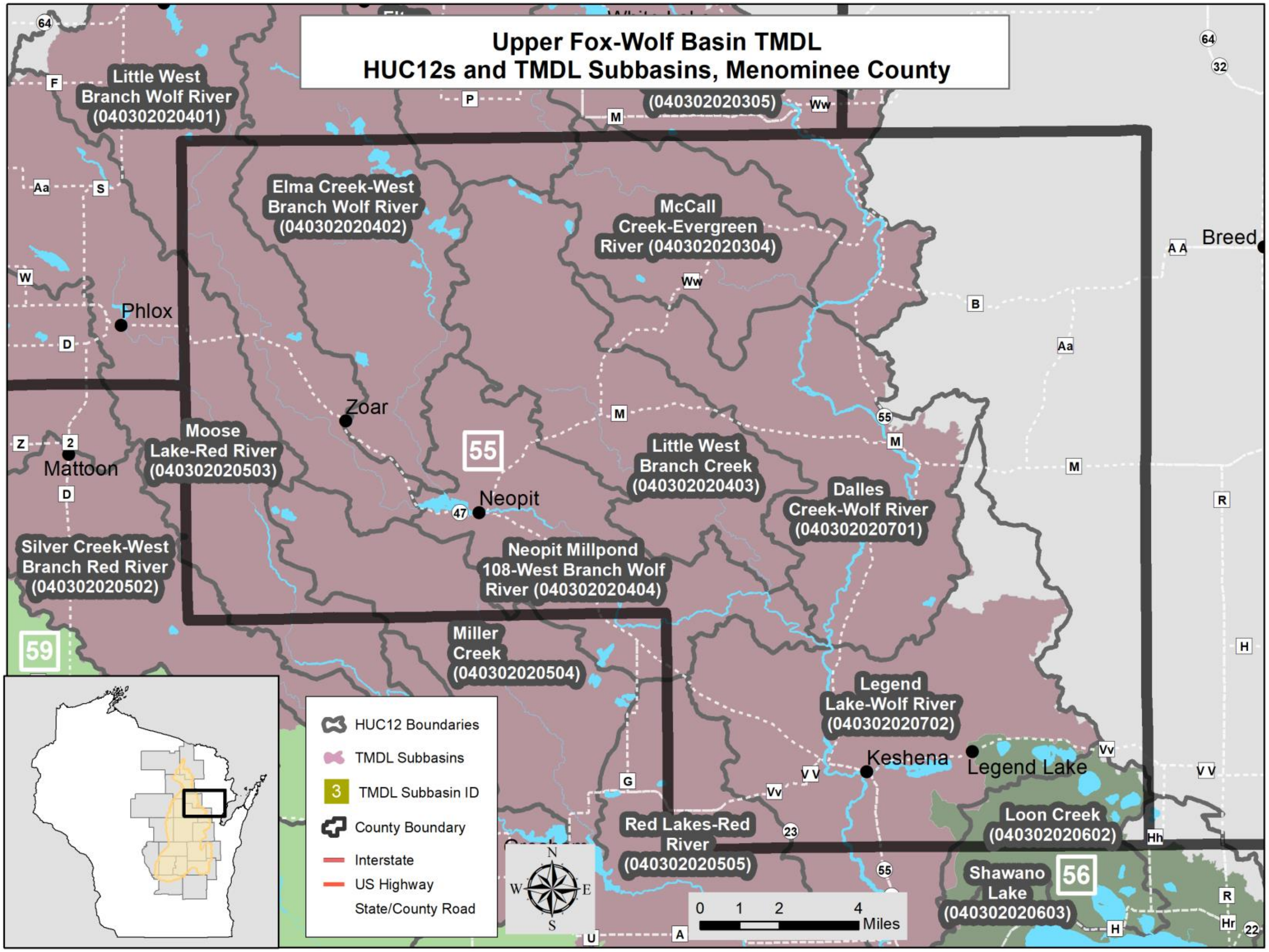
Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Green Lake County
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
Town Ditch (040302011104)
City of Berlin-Fox River (040302011106)
Hogars Bayou-Fox River (040302011107)
Rush Creek (040302011002
Puchyan River (040302011103)
Mill Race-Fox River (040302011102)
Silver Creek (040302010901)
Big Green Lake (040302010902)
Puckaway Lake-Fox River (040302010605)
Headwaters Grand River (040302010401)
Grand River (040302010504)
Grand Lake-Grand River (040302010502)
Little Green Lake-Grand River (040302010402)
Belle Fountain Creek (040302010503)
Sand Spring Creek-Fox River (040302010101)
Lake Emily (040302010501)
Swan Lake-Fox River (040302010102)
Berlin
Princeton
Green Lake
Marquette
Fairwater
Markesan
Kingston
Manchester
Dalton
Friesland
0 0.75 1.5 3 Miles


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Langlade County
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.5 3 6 Miles
Squaw Creek-Swamp Creek (040302020105)
(040302020103)
Bog Brook-Lily River (040302020204)
Pickerel Creek (040302020201)
Spider Creek-Wolf River (040302020106)
Hunting River (040302020202)
East Branch of the Lily River (040302020205)
Squaw Creek-Wolf River (040302020206)
Ninemile Creek (040302020301)
Slough Gundy Rapids-Wolf River (040302020302)
Elton Creek-Evergreen River (040302020303)
Little West Branch Wolf River (040302020401)
White Lake Creek-Wolf River (040302020305)
Moose Lake-Red River (040302020503)
Elma Creek-West Branch Wolf River (040302020402)
McCall Creek-Evergreen River (040302020304)
Mattoon Creek-West Branch Red River (040302020501)
Little West Branch Creek (040302020403)
Dalles Creek-Wolf River (040302020701)
77
76
80
55
58
Blackwell
Enterprise
Harrison
Parrish
Nashville
Post Lake
Elcho
Wabeno
Carter
Summit Lake
Pearson
Townsend
Lily
Kempster
Hollister
Neva
Deerbrook
Bryant
Langlade
Polar
Elton
White Lake
Antigo
Phlox
Zoar

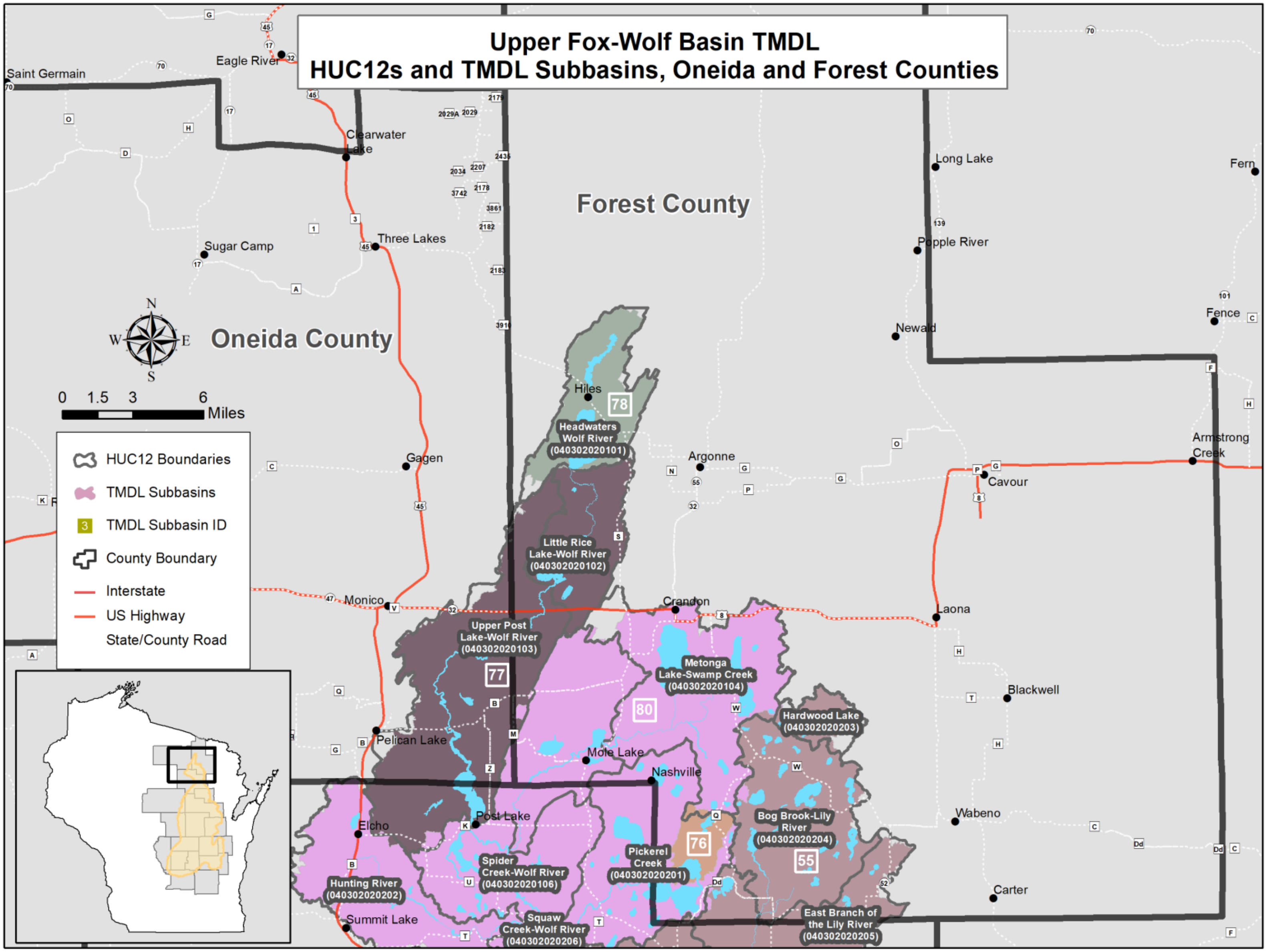


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Marathon County
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.5 3 6 Miles
Goodrich
Hamburg
Athens
Milan
Rib Falls
Edgar
Marathon City
Marathon
Fenwood
Brokaw
Wausau
Schofield
Weston
Rothschild
Evergreen
Mosinee
Knowlton
Ringle
Hatley
Aniwa
Birnamwood
Norrie
Eland
Elderon
Bevent
Galloway
58
81
63
66
Spranger Creek-South Branch Embarrass River (040302021001)
Comet Creek (040302021503)
Holt Creek-Little Wolf River (040302021501)
Flume Creek (040302021502)
Bradley Creek-Little Wolf River (040302021504)

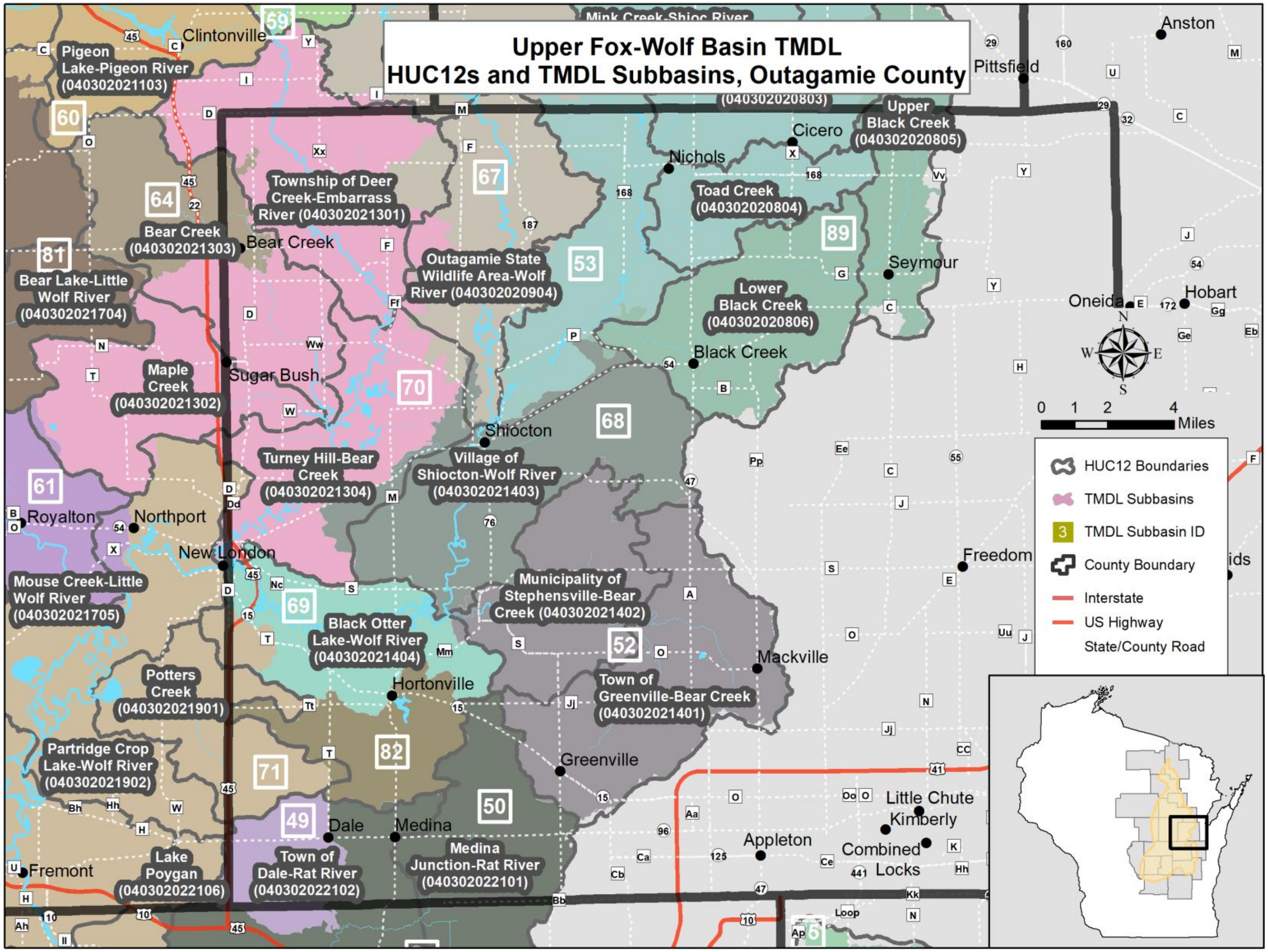

Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Marquette and Adams Counties
Adams County
Marquette County
Friendship
Adams
Grand Marsh
Brooks
Oxford
Westfield
Packwaukee
Endeavor
Montello
Mecan
Marquette
Kingston
Dalton
Princeton
Germania
Neshkoro
Dakota
Lohrville
Big Spring
Briggsville
Tagatz Creek (040302010301)
Westfield Creek (040302010302)
Klawitter Creek (040302010303)
Montello River (040302010304)
Chafee Creek (040302010702)
Mecan River (040302010704)
Lunch Creek (040302010803)
Little Lunch Creek-White River (040302010804)
Sucker Creek (040302010805)
White River (040302010806)
Black Creek (040302011101)
Mill Race-Fox River (040302011102)
Buffalo Lake-Fox River (040302010604)
Neenah Lake-Neenah Creek (040302010201)
Neenah Creek (040302010205)
Green Creek (040302010202)
South Branch Neenah Creek (040302010203)
Big Slough (040302010204)
Good Earth Creek-Fox River (040302010603)
Portage Canal-Fox River (040302010601)
French Creek (040302010602)
Grand River (040302010504)
Belle Fountain Creek (040302010503)
Puckaway Lake-Fox River (040302010605)
0 1 2 4 Miles
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road

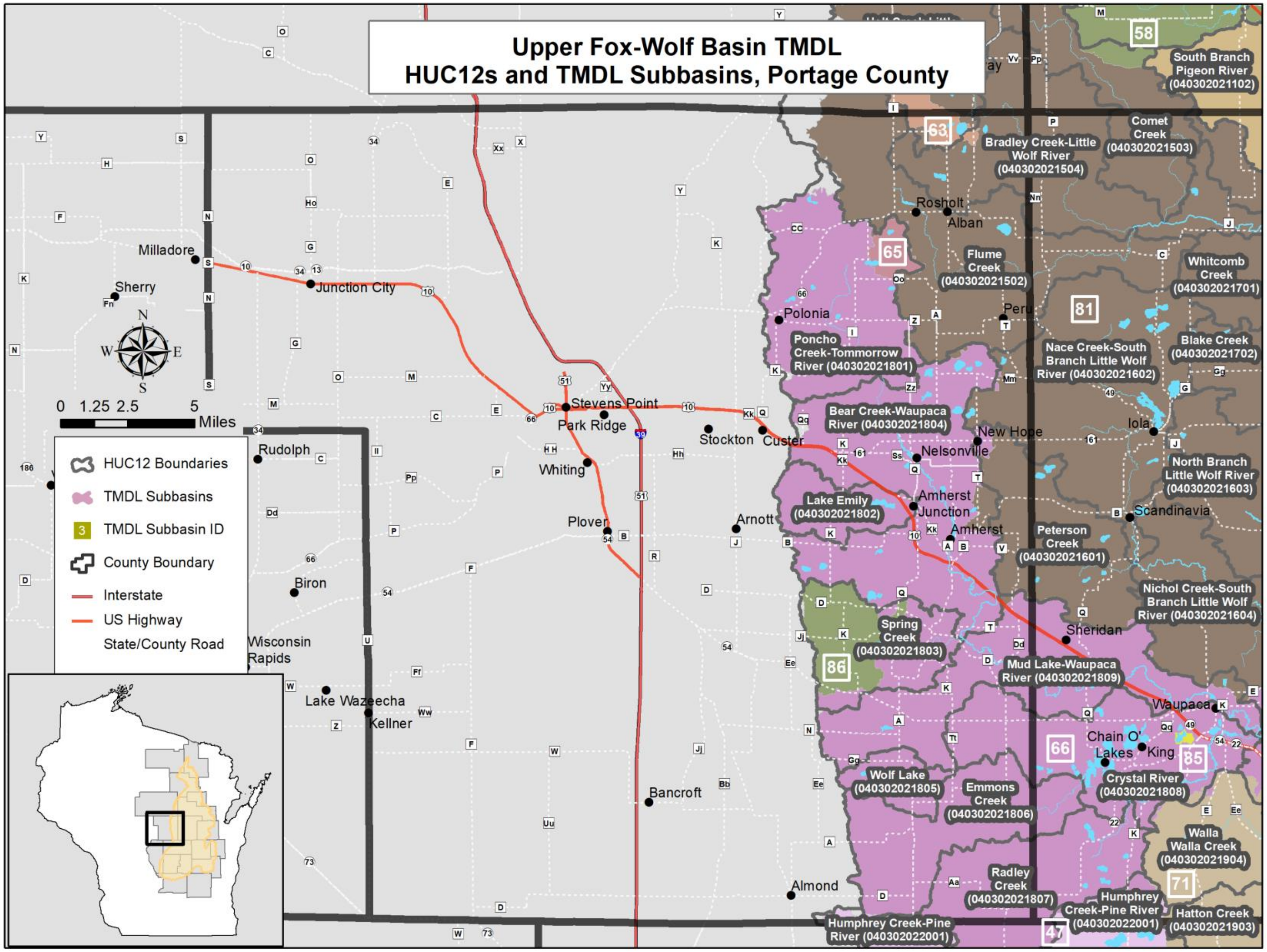


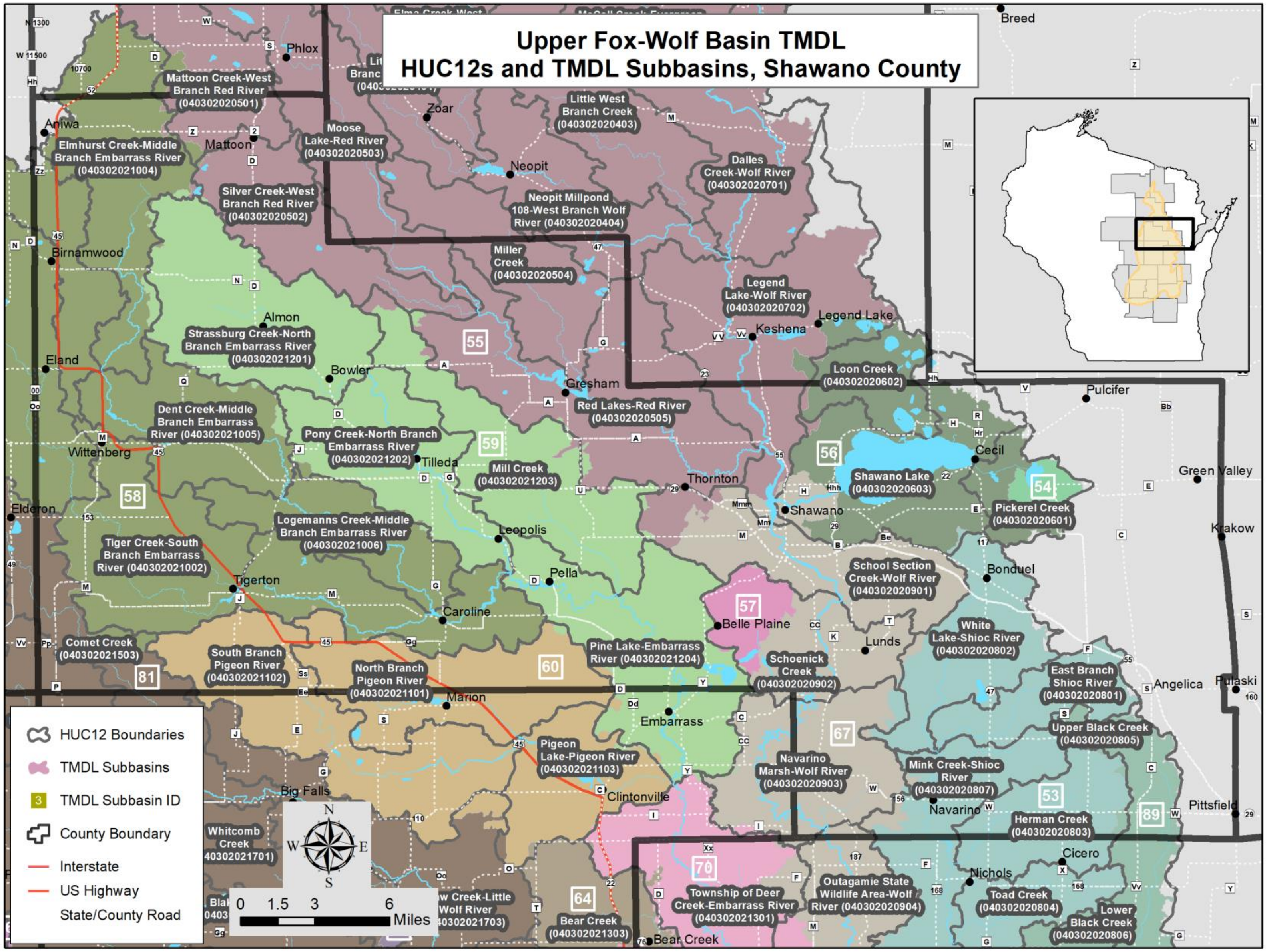
Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Menominee County
Little West Branch Wolf River (040302020401)
(040302020305)
Elma Creek-West Branch Wolf River (040302020402)
McCall Creek-Evergreen River (040302020304)
Breed
Phlox
Zoar
Mattoon
Moose Lake-Red River (040302020503)
55
Neopit
Little West Branch Creek (040302020403)
Dalles Creek-Wolf River (040302020701)
Silver Creek-West Branch Red River (040302020502)
Neopit Millpond 108-West Branch Wolf River (040302020404)
59
Miller Creek (040302020504)
Legend Lake-Wolf River (040302020702)
Keshena
Legend Lake
Loon Creek (040302020602)
Red Lakes-Red River (040302020505)
Shawano Lake (040302020603)
56
HUC12 Boundaries
TMDL Subbasins
3 TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
N
W
E
S
0 1 2 4 Miles

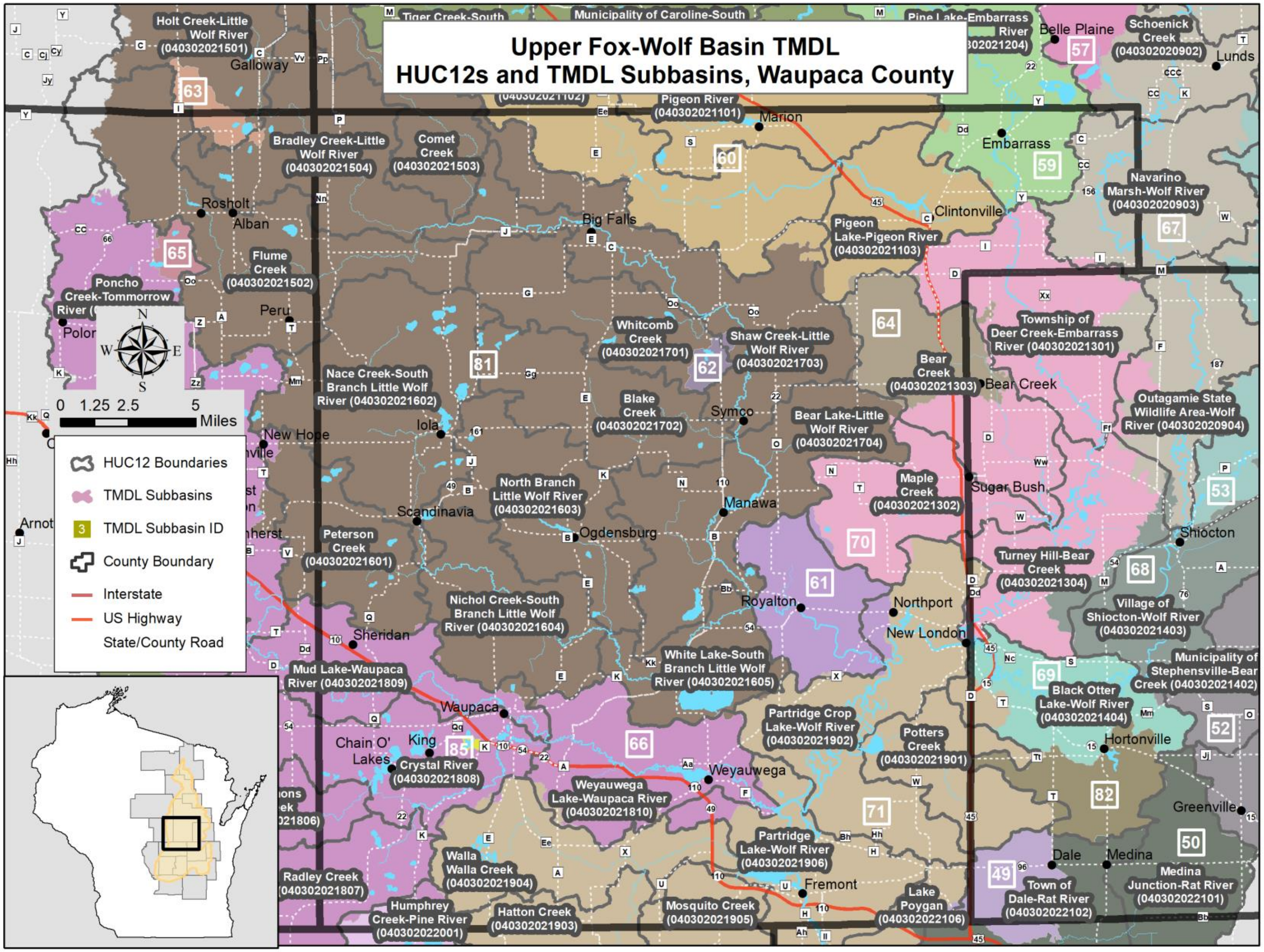


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Oneida and Forest Counties
Forest County
Oneida County
0 1.5 3 6
Miles
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
Saint Germain
Eagle River
Clearwater Lake
Three Lakes
Sugar Camp
Gagen
Monico
Pelican Lake
Elcho
Summit Lake
Hiles
Argonne
Crandon
Mole Lake
Nashville
Post Lake
Long Lake
Fern
Popple River
Newald
Fence
Armstrong Creek
Cavour
Laona
Blackwell
Wabeno
Carter
Headwaters Wolf River (040302020101)
Little Rice Lake-Wolf River (040302020102)
Upper Post Lake-Wolf River (040302020103)
Metonga Lake-Swamp Creek (040302020104)
Hardwood Lake (040302020203)
Bog Brook-Lily River (040302020204)
Pickerel Creek (040302020201)
Spider Creek-Wolf River (040302020106)
Hunting River (040302020202)
Squaw Creek-Wolf River (040302020206)
East Branch of the Lily River (040302020205)
78
77
80
76
55


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Outagamie County
Pigeon Lake-Pigeon River (040302021103)
Township of Deer Creek-Embarrass River (040302021301)
Bear Creek (040302021303)
Bear Lake-Little Wolf River (040302021704)
Outagamie State Wildlife Area-Wolf River (040302020904)
Toad Creek (040302020804)
Upper Black Creek (040302020805)
Lower Black Creek (040302020806)
Maple Creek (040302021302)
Turney Hill-Bear Creek (040302021304)
Village of Shiocton-Wolf River (040302021403)
Mouse Creek-Little Wolf River (040302021705)
Municipality of Stephensville-Bear Creek (040302021402)
Black Otter Lake-Wolf River (040302021404)
Potters Creek (040302021901)
Town of Greenville-Bear Creek (040302021401)
Partridge Crop Lake-Wolf River (040302021902)
Lake Poygan (040302022106)
Town of Dale-Rat River (040302022102)
Medina Junction-Rat River (040302022101)
Mink Creek-Shioc River
(040302020803)
Clintonville
Pittsfield
Anston
Cicero
Nichols
Bear Creek
Seymour
Oneida
Hobart
Black Creek
Sugar Bush
Shiocton
Royalton
Northport
New London
Freedom
Mackville
Hortonville
Greenville
Little Chute
Kimberly
Appleton
Combined Locks
Dale
Medina
Fremont
0 1 2 4 Miles
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Portage County
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.25 2.5 5
Miles
Milladore
Sherry
Junction City
Polonia
Stevens Point
Park Ridge
Whiting
Plover
Stockton
Custer
Arnott
Rudolph
Biron
Wisconsin Rapids
Lake Wazeecha
Kellner
Bancroft
Almond
Rosholt
Alban
Peru
New Hope
Iola
Nelsonville
Amherst Junction
Amherst
Scandinavia
Sheridan
Waupaca
Chain O' Lakes
King
South Branch Pigeon River (040302021102)
Comet Creek (040302021503)
Bradley Creek-Little Wolf River (040302021504)
Flume Creek (040302021502)
Whitcomb Creek (040302021701)
Blake Creek (040302021702)
Nace Creek-South Branch Little Wolf River (040302021602)
Poncho Creek-Tommorrow River (040302021801)
Bear Creek-Waupaca River (040302021804)
North Branch Little Wolf River (040302021603)
Lake Emily (040302021802)
Peterson Creek (040302021601)
Nichol Creek-South Branch Little Wolf River (040302021604)
Spring Creek (040302021803)
Mud Lake-Waupaca River (040302021809)
Crystal River (040302021808)
Wolf Lake (040302021805)
Emmons Creek (040302021806)
Walla Walla Creek (040302021904)
Radley Creek (040302021807)
Humphrey Creek-Pine River (040302022001)
Hatton Creek (040302021903)
58
63
65
81
86
66
85
71
47


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Shawano County
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.5 3 6 Miles
Mattoon Creek-West Branch Red River (040302020501)
Elmhurst Creek-Middle Branch Embarrass River (040302021004)
Moose Lake-Red River (040302020503)
Silver Creek-West Branch Red River (040302020502)
Little West Branch Creek (040302020403)
Dalles Creek-Wolf River (040302020701)
Neopit Millpond 108-West Branch Wolf River (040302020404)
Miller Creek (040302020504)
Legend Lake-Wolf River (040302020702)
Strassburg Creek-North Branch Embarrass River (040302021201)
Loon Creek (040302020602)
Red Lakes-Red River (040302020505)
Dent Creek-Middle Branch Embarrass River (040302021005)
Pony Creek-North Branch Embarrass River (040302021202)
Mill Creek (040302021203)
Shawano Lake (040302020603)
Pickerel Creek (040302020601)
Logemanns Creek-Middle Branch Embarrass River (040302021006)
Tiger Creek-South Branch Embarrass River (040302021002)
School Section Creek-Wolf River (040302020901)
White Lake-Shioc River (040302020802)
Comet Creek (040302021503)
South Branch Pigeon River (040302021102)
North Branch Pigeon River (040302021101)
Pine Lake-Embarrass River (040302021204)
Schoenick Creek (040302020902)
East Branch Shioc River (040302020801)
Upper Black Creek (040302020805)
Pigeon Lake-Pigeon River (040302021103)
Navarino Marsh-Wolf River (040302020903)
Mink Creek-Shioc River (040302020807)
Herman Creek (040302020803)
Whitcomb Creek (040302021701)
Bear Creek (040302021303)
Township of Deer Creek-Embarrass River (040302021301)
Outagamie State Wildlife Area-Wolf River (040302020904)
Toad Creek (040302020804)
Lower Black Creek (040302020806)
55
56
54
59
58
57
60
81
67
53
89
70
64
Breed
Phlox
Zoar
Neopit
Aniwa
Mattoon
Birnamwood
Almon
Bowler
Eland
Gresham
Keshena
Legend Lake
Pulcifer
Wittenberg
Tilleda
Cecil
Thornton
Shawano
Green Valley
Elderon
Leopolis
Krakow
Bonduel
Pella
Tigerton
Caroline
Belle Plaine
Lunds
Angelica
Pulaski
Marion
Embarrass
Big Falls
Clintonville
Navarino
Pittsfield
Cicero
Nichols
Bear Creek


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Waupaca County
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1.25 2.5 5 Miles
Holt Creek-Little Wolf River (040302021501)
Bradley Creek-Little Wolf River (040302021504)
Comet Creek (040302021503)
Pigeon River (040302021101)
Pigeon Lake-Pigeon River (040302021103)
Flume Creek (040302021502)
Poncho Creek-Tommorrow River
Whitcomb Creek (040302021701)
Shaw Creek-Little Wolf River (040302021703)
Nace Creek-South Branch Little Wolf River (040302021602)
Blake Creek (040302021702)
Bear Lake-Little Wolf River (040302021704)
Bear Creek (040302021303)
Township of Deer Creek-Embarrass River (040302021301)
Navarino Marsh-Wolf River (040302020903)
Schoenick Creek (040302020902)
Outagamie State Wildlife Area-Wolf River (040302020904)
Maple Creek (040302021302)
North Branch Little Wolf River (040302021603)
Peterson Creek (040302021601)
Nichol Creek-South Branch Little Wolf River (040302021604)
Turney Hill-Bear Creek (040302021304)
Village of Shiocton-Wolf River (040302021403)
Municipality of Stephensville-Bear Creek (040302021402)
Black Otter Lake-Wolf River (040302021404)
White Lake-South Branch Little Wolf River (040302021605)
Mud Lake-Waupaca River (040302021809)
Partridge Crop Lake-Wolf River (040302021902)
Potters Creek (040302021901)
Crystal River (040302021808)
Weyauwega Lake-Waupaca River (040302021810)
Partridge Lake-Wolf River (040302021906)
Walla Walla Creek (040302021904)
Radley Creek (040302021807)
Humphrey Creek-Pine River (040302022001)
Hatton Creek (040302021903)
Mosquito Creek (040302021905)
Lake Poygan (040302022106)
Town of Dale-Rat River (040302022102)
Medina Junction-Rat River (040302022101)
Municipality of Caroline-South
Tiger Creek-South
Pine Lake-Embarrass River
Galloway
Rosholt
Alban
Peru
New Hope
Iola
Scandinavia
Ogdensburg
Big Falls
Marion
Clintonville
Embarrass
Belle Plaine
Lunds
Symco
Manawa
Royalton
Northport
New London
Bear Creek
Sugar Bush
Shiocton
Hortonville
Greenville
Dale
Medina
Fremont
Weyauwega
Waupaca
King
Chain O' Lakes
Sheridan
Arnot
63
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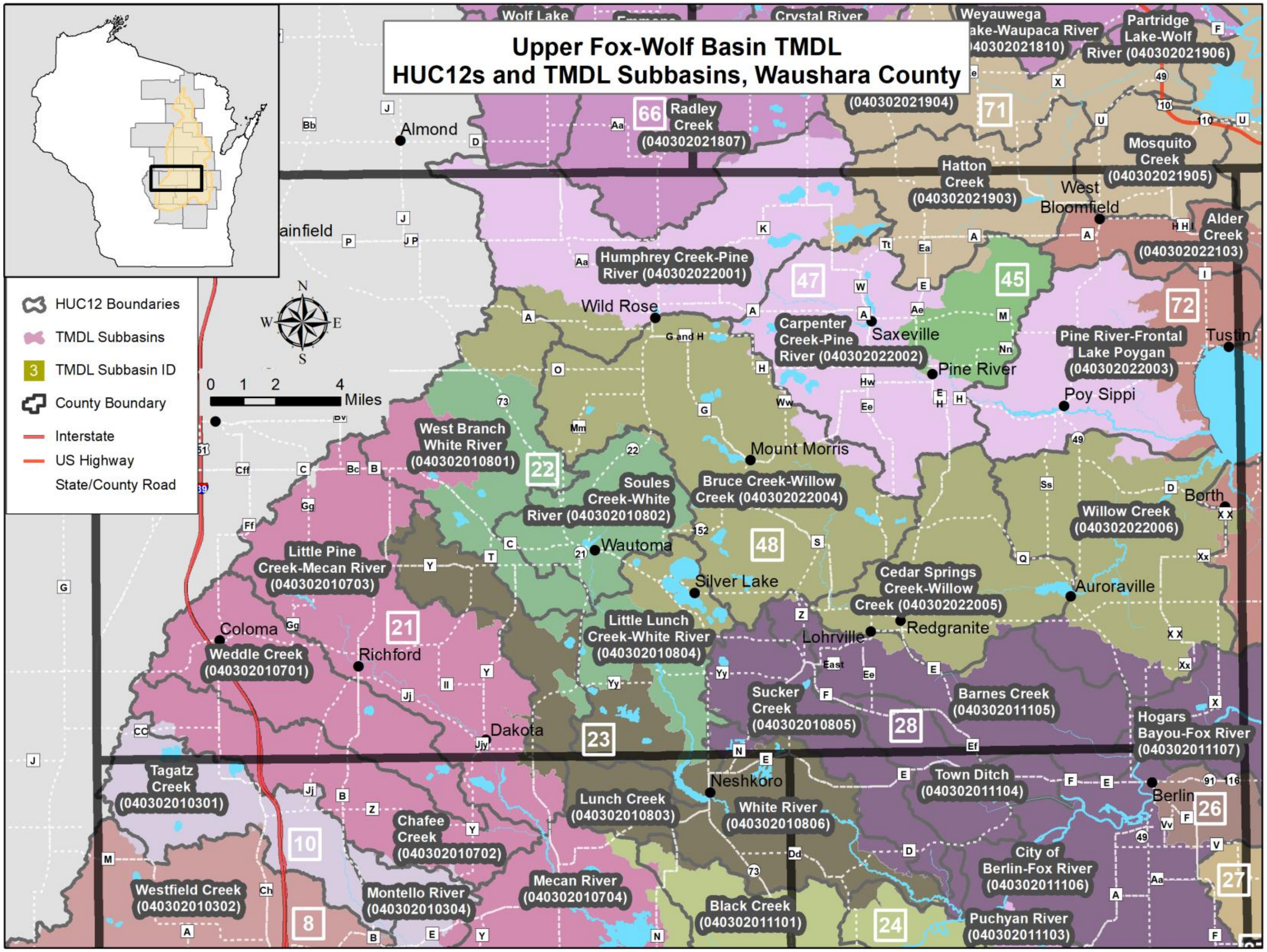
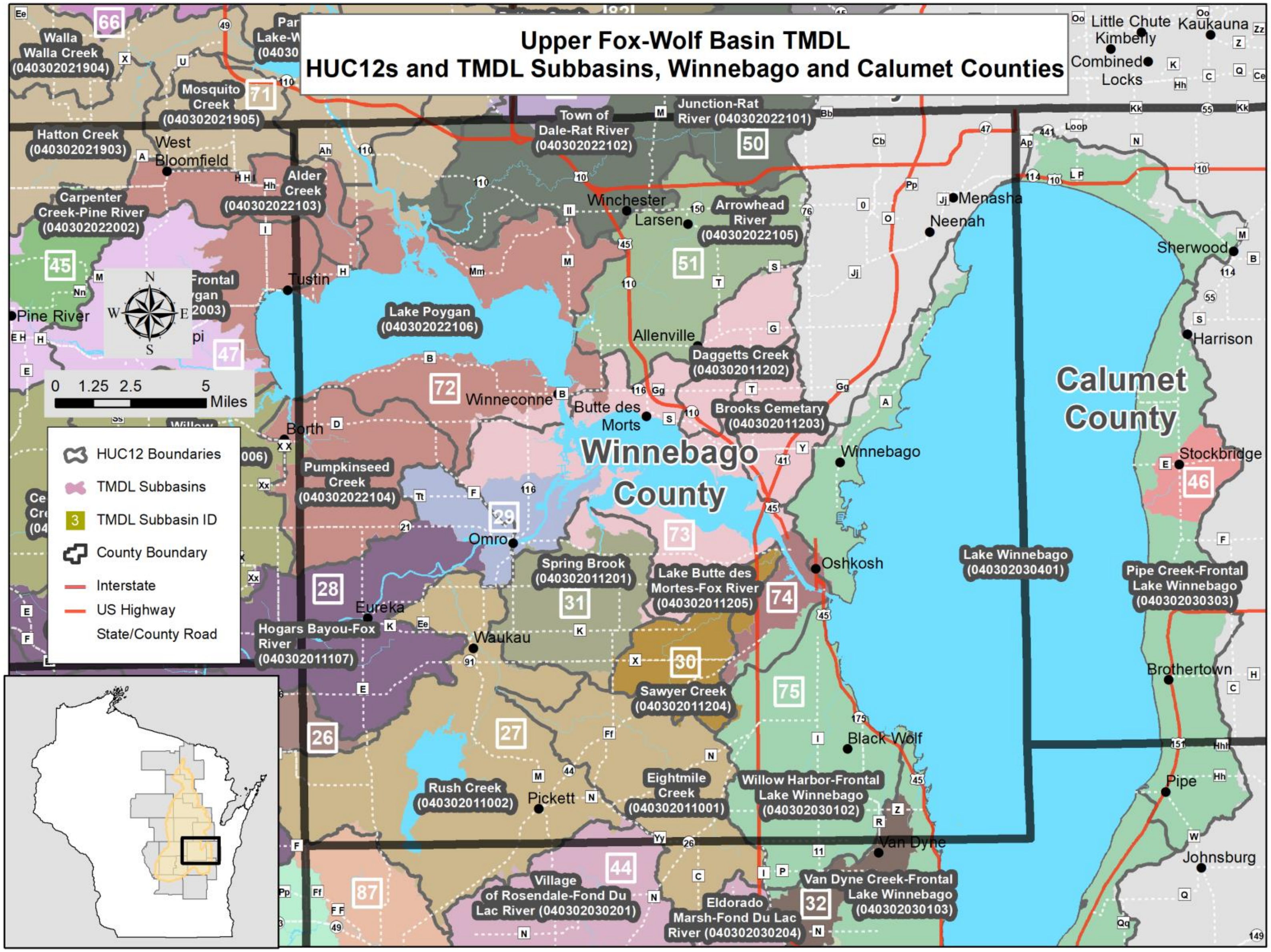

Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Waushara County
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road
0 1 2 4 Miles
Radley Creek (040302021807)
Humphrey Creek-Pine River (040302022001)
Carpenter Creek-Pine River (040302022002)
Pine River-Frontal Lake Poygan (040302022003)
Hatton Creek (040302021903)
Mosquito Creek (040302021905)
Partridge Lake-Wolf River (040302021906)
Alder Creek (040302022103)
(040302021904)
West Branch White River (040302010801)
Soules Creek-White River (040302010802)
Bruce Creek-Willow Creek (040302022004)
Willow Creek (040302022006)
Cedar Springs Creek-Willow Creek (040302022005)
Little Pine Creek-Mecan River (040302010703)
Weddle Creek (040302010701)
Little Lunch Creek-White River (040302010804)
Sucker Creek (040302010805)
Barnes Creek (040302011105)
Hogars Bayou-Fox River (040302011107)
Tagatz Creek (040302010301)
Chafee Creek (040302010702)
Lunch Creek (040302010803)
White River (040302010806)
Town Ditch (040302011104)
City of Berlin-Fox River (040302011106)
Westfield Creek (040302010302)
Montello River (040302010304)
Mecan River (040302010704)
Black Creek (040302011101)
Puchyan River (040302011103)
Almond
Wild Rose
Saxeville
Pine River
Poy Sippi
Tustin
West Bloomfield
Mount Morris
Wautoma
Silver Lake
Auroraville
Borth
Redgranite
Lohrville
Coloma
Richford
Dakota
Neshkoro
Berlin
66 71 47 45 72 22 48 21 23 28 26 27 10 8 24


Upper Fox-Wolf Basin TMDL
HUC12s and TMDL Subbasins, Winnebago and Calumet Counties
Winnebago County
Calumet County
Walla Creek (040302021904)
Mosquito Creek (040302021905)
Hatton Creek (040302021903)
Carpenter Creek-Pine River (040302022002)
Alder Creek (040302022103)
Town of Dale-Rat River (040302022102)
Junction-Rat River (040302022101)
Arrowhead River (040302022105)
Lake Poygan (040302022106)
Daggetts Creek (040302011202)
Brooks Cemetary (040302011203)
Pumpkinseed Creek (040302022104)
Spring Brook (040302011201)
Lake Butte des Mortes-Fox River (040302011205)
Hogars Bayou-Fox River (040302011107)
Sawyer Creek (040302011204)
Rush Creek (040302011002)
Eightmile Creek (040302011001)
Willow Harbor-Frontal Lake Winnebago (040302030102)
Lake Winnebago (040302030401)
Pipe Creek-Frontal Lake Winnebago (040302030303)
Van Dyne Creek-Frontal Lake Winnebago (040302030103)
Village of Rosendale-Fond Du Lac River (040302030201)
Eldorado Marsh-Fond Du Lac River (040302030204)
Little Chute
Kimberly
Kaukauna
Combined Locks
Menasha
Neenah
Sherwood
Harrison
Stockbridge
Brothertown
Pipe
Johnsburg
Winchester
Larsen
Allenville
Butte des Morts
Winneconne
Tustin
West Bloomfield
Pine River
Borth
Omro
Eureka
Waukau
Pickett
Oshkosh
Winnebago
Black Wolf
Van Dyne
0 1.25 2.5 5 Miles
HUC12 Boundaries
TMDL Subbasins
TMDL Subbasin ID
County Boundary
Interstate
US Highway
State/County Road

9 SNAPPLUS YIELD TARGETS

Table 1. Agricultural total phosphorus (TP) and total suspended solids (TSS) yield target for TMDL Subbasins. Targets are comparable to outputs from SnapPlus and correspond to attainment of TMDL agricultural load allocations. The targets are calculated from baseline yields for each TMDL Subbasin and percent reductions for the TMDL Subbasin. Cells with '-' indicate model subbasins that lack sufficient agricultural area to establish a baseline load.

TMDL Subbasin	TP			TSS		
	Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
1	1.68	88%	0.20	1.71	47%	0.91
2	2.74	79%	0.57	2.72	47%	1.45
3	3.41	79%	0.71	3.29	79%	0.69
4	2.10	88%	0.25	1.80	47%	0.96
5	3.14	74%	0.83	2.64	64%	0.96
6	2.31	88%	0.27	2.33	47%	1.24
7	2.14	88%	0.25	2.16	47%	1.15
8	2.14	83%	0.37	2.30	47%	1.22
9	1.90	88%	0.22	1.94	47%	1.03
10	1.85	83%	0.32	1.96	47%	1.04
11	4.29	72%	1.19	2.92	54%	1.36
12	3.94	83%	0.68	2.56	86%	0.36
13	3.24	83%	0.56	2.32	77%	0.53
14	2.44	83%	0.42	1.97	47%	1.05
15	2.13	83%	0.36	1.87	47%	1.00
16	2.26	83%	0.39	1.78	47%	0.95
17	4.12	68%	1.31	2.73	87%	0.36
18	4.24	59%	1.75	2.83	82%	0.51
19	2.97	45%	1.62	2.15	72%	0.61
20	3.66	0%	3.66	2.44	41%	1.44
21	1.21	83%	0.21	1.29	47%	0.69
22	0.85	83%	0.14	0.92	41%	0.54
23	1.16	83%	0.20	1.20	41%	0.71
24	1.51	83%	0.26	1.53	47%	0.82
25	1.98	83%	0.34	1.82	41%	1.07
26	1.75	83%	0.30	1.52	41%	0.89
27	2.69	83%	0.46	2.00	58%	0.84
28	1.60	83%	0.27	1.19	41%	0.70
29	1.91	83%	0.33	1.52	30%	1.07
30	2.30	83%	0.39	1.78	48%	0.92
31	2.07	83%	0.35	1.54	55%	0.69
32	2.63	83%	0.45	1.73	51%	0.84
33	2.49	83%	0.42	1.54	44%	0.86
34	2.62	83%	0.45	1.41	16%	1.19
35	2.84	83%	0.48	2.08	77%	0.47
36	3.09	83%	0.53	2.26	85%	0.35
37	2.74	85%	0.41	1.82	82%	0.32
38	2.61	83%	0.45	1.92	24%	1.45
39	2.87	83%	0.49	2.34	65%	0.81
40	3.64	83%	0.62	2.63	47%	1.39
41	3.47	83%	0.59	2.41	74%	0.62
42	2.48	83%	0.42	1.15	17%	0.95
43	2.85	83%	0.49	1.44	43%	0.81

44	3.24	83%	0.55	2.35	70%	0.70
45	1.40	83%	0.24	0.96	0%	0.96
46	2.36	83%	0.40	1.89	85%	0.29
47	1.49	83%	0.25	1.17	0%	1.17
48	1.72	83%	0.29	1.02	0%	1.02
49	2.60	83%	0.44	2.31	71%	0.68
50	2.08	83%	0.35	1.68	0%	1.68
51	1.86	83%	0.32	1.42	66%	0.48
52	2.50	83%	0.43	2.23	80%	0.45
53	1.71	83%	0.29	1.43	35%	0.93
54	1.92	31%	1.33	1.63	35%	1.05
55	3.10	83%	0.53	2.16	35%	1.39
56	1.78	20%	1.42	1.69	35%	1.10
57	1.55	32%	1.05	1.37	35%	0.89
58	2.52	83%	0.43	1.80	35%	1.17
59	1.65	83%	0.28	1.48	35%	0.96
60	2.06	83%	0.35	1.60	42%	0.93
61	1.96	83%	0.33	1.42	89%	0.16
62	2.20	25%	1.66	1.77	52%	0.86
63	2.28	83%	0.39	1.54	35%	0.99
64	1.80	83%	0.31	1.13	35%	0.73
65	1.99	38%	1.23	1.77	35%	1.14
66	2.06	83%	0.35	2.02	35%	1.30
67	1.52	83%	0.26	1.30	35%	0.84
68	1.89	83%	0.32	1.35	35%	0.87
69	2.11	83%	0.36	1.67	35%	1.08
70	1.85	83%	0.31	1.39	74%	0.37
71	1.62	83%	0.28	1.13	35%	0.73
72	1.55	83%	0.26	0.95	0%	0.95
73	2.19	83%	0.37	1.76	0%	1.76
74	3.30	83%	0.56	2.84	0%	2.84
75	2.59	83%	0.44	1.88	0%	1.88
76	-	-	-	-	-	-
77	3.13	34%	2.07	1.94	35%	1.26
78	1.85	34%	1.23	1.41	35%	0.92
79	4.30	80%	0.84	2.84	78%	0.61
80	2.77	83%	0.47	1.98	35%	1.28
81	2.11	83%	0.36	1.50	47%	0.80
82	3.09	69%	0.96	2.53	81%	0.48
83	4.30	34%	2.83	2.84	79%	0.60
84	3.24	54%	1.49	2.32	75%	0.58
85	2.00	90%	0.20	1.79	35%	1.16
86	2.36	55%	1.06	2.38	36%	1.52
87	3.95	76%	0.94	2.65	66%	0.91
88	2.68	83%	0.46	1.38	0%	1.38
89	1.97	83%	0.33	1.64	35%	1.06

Table 2. Agricultural total phosphorus (TP) and total suspended solids (TSS) yield targets for Model Subwatersheds. Targets are comparable to outputs from SnapPlus and correspond to attainment of TMDL agricultural load allocations. The targets are calculated from baseline yields for each Model Subwatershed and percent reductions for the TMDL Subbasin that the Model Subwatershed is located in. Cells with '-' indicate model subbasins that lack sufficient agricultural area to establish a baseline load.

Model Subwatershed	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
1	78	1.85	34%	1.23	1.41	35%	0.92
2	80	2.95	83%	0.50	2.36	35%	1.53
3	77	3.13	34%	2.07	1.94	35%	1.26
4	80	2.10	83%	0.36	1.84	35%	1.19
5	80	1.69	83%	0.29	1.55	35%	1.00
6	76	-	-	-	-	-	-
7	80	1.35	83%	0.23	0.73	35%	0.48
8	80	-	-	-	-	-	-
9	80	4.20	83%	0.72	2.20	35%	1.42
10	80	3.80	83%	0.65	2.39	35%	1.55
11	80	-	-	-	-	-	-
12	55	3.00	83%	0.51	1.58	35%	1.02
13	55	3.01	83%	0.51	2.16	35%	1.40
14	55	2.23	83%	0.38	1.47	35%	0.95
15	55	3.25	83%	0.55	1.80	35%	1.16
16	55	-	-	-	-	-	-
17	55	4.61	83%	0.78	2.63	35%	1.69
18	55	4.39	83%	0.74	2.81	35%	1.82
19	55	-	-	-	-	-	-
20	55	3.01	83%	0.51	1.59	35%	1.03
21	55	6.25	83%	1.06	3.95	35%	2.55
22	55	6.00	83%	1.02	3.57	35%	2.30
23	55	5.58	83%	0.95	3.40	35%	2.20
24	55	1.89	83%	0.32	1.97	35%	1.27
25	55	3.31	83%	0.56	1.92	35%	1.24
26	55	3.82	83%	0.65	1.63	35%	1.05
27	55	-	-	-	-	-	-
28	55	5.23	83%	0.89	3.14	35%	2.03
29	55	4.01	83%	0.68	2.66	35%	1.72
30	55	-	-	-	-	-	-
31	58	2.50	83%	0.43	1.67	35%	1.08
32	58	2.44	83%	0.42	1.65	35%	1.07
33	55	1.11	83%	0.19	1.30	35%	0.84
34	55	1.22	83%	0.21	1.38	35%	0.89
35	55	1.33	83%	0.23	1.14	35%	0.74
36	58	2.27	83%	0.39	1.74	35%	1.12
37	55	0.91	83%	0.15	1.01	35%	0.65
38	55	1.31	83%	0.22	1.34	35%	0.86
39	54	1.92	31%	1.33	1.63	35%	1.05
40	55	1.24	83%	0.21	1.17	35%	0.76
41	67	1.78	83%	0.30	1.69	35%	1.09
42	59	1.94	83%	0.33	1.61	35%	1.04
43	58	2.06	83%	0.35	2.03	35%	1.31
44	59	1.51	83%	0.26	1.59	35%	1.03

Model Subwatershed	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
45	59	1.58	83%	0.27	1.68	35%	1.08
46	59	1.07	83%	0.18	1.21	35%	0.78
47	58	2.29	83%	0.39	1.76	35%	1.14
48	58	2.74	83%	0.47	1.86	35%	1.20
49	57	1.55	32%	1.05	1.37	35%	0.89
50	63	2.28	83%	0.39	1.54	35%	0.99
51	60	2.05	83%	0.35	1.77	42%	1.03
52	60	2.22	83%	0.38	1.66	42%	0.97
53	60	1.91	83%	0.33	1.33	42%	0.77
54	59	1.49	83%	0.25	1.24	35%	0.80
55	70	-	-	-	-	-	-
56	81	2.35	83%	0.40	1.66	47%	0.89
57	81	2.24	83%	0.38	1.31	47%	0.70
58	81	1.97	83%	0.34	1.51	47%	0.80
59	81	2.55	83%	0.43	1.87	47%	1.00
60	65	1.99	38%	1.23	1.77	35%	1.14
61	53	1.76	83%	0.30	1.54	35%	0.99
62	53	1.73	83%	0.30	1.43	35%	0.93
63	81	2.13	83%	0.36	1.63	47%	0.87
64	81	1.66	83%	0.28	1.25	47%	0.66
65	62	2.20	25%	1.66	1.77	52%	0.86
66	64	1.80	83%	0.31	1.13	35%	0.73
67	81	1.84	83%	0.31	1.29	47%	0.69
68	81	1.88	83%	0.32	1.40	47%	0.75
69	53	1.81	83%	0.31	1.55	35%	1.00
70	89	1.97	83%	0.33	1.64	35%	1.06
71	70	2.08	83%	0.36	1.40	74%	0.37
72	70	1.77	83%	0.30	1.45	74%	0.38
73	53	0.93	83%	0.16	0.59	35%	0.38
74	67	1.45	83%	0.25	1.18	35%	0.76
75	70	1.09	83%	0.19	0.63	74%	0.17
76	70	1.79	83%	0.30	1.43	74%	0.38
77	81	2.27	83%	0.39	1.42	47%	0.76
78	68	1.98	83%	0.34	1.27	35%	0.82
79	68	1.96	83%	0.33	1.49	35%	0.97
80	66	2.58	83%	0.44	2.62	35%	1.69
81	81	2.46	83%	0.42	1.60	47%	0.86
82	66	2.36	83%	0.40	2.49	35%	1.61
83	81	1.72	83%	0.29	1.47	47%	0.78
84	81	2.05	83%	0.35	1.48	47%	0.79
85	61	1.94	83%	0.33	1.47	89%	0.17
86	81	1.67	83%	0.28	1.24	47%	0.66
87	81	2.37	83%	0.40	1.39	47%	0.74
88	81	1.96	83%	0.33	1.54	47%	0.82
89	70	1.80	83%	0.31	1.24	74%	0.33
90	71	-	-	-	-	-	-
91	66	2.36	83%	0.40	2.38	35%	1.54
92	71	2.05	83%	0.35	1.33	35%	0.86
93	61	1.97	83%	0.34	1.37	89%	0.16
94	69	2.09	83%	0.36	1.63	35%	1.05

Model Subwatershed	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
95	68	1.71	83%	0.29	1.16	35%	0.75
96	52	2.50	83%	0.43	2.23	80%	0.45
97	69	2.36	83%	0.40	1.95	35%	1.26
98	69	1.87	83%	0.32	1.42	35%	0.92
99	66	2.04	83%	0.35	2.42	35%	1.56
100	71	1.46	83%	0.25	0.81	35%	0.53
101	66	2.71	83%	0.46	1.93	35%	1.25
102	66	1.33	83%	0.23	1.28	35%	0.83
103	71	2.09	83%	0.36	1.69	35%	1.10
104	82	3.09	69%	0.96	2.53	81%	0.48
105	66	1.73	83%	0.29	1.24	35%	0.80
106	66	2.00	83%	0.34	1.79	35%	1.16
107	66	1.60	83%	0.27	2.03	35%	1.32
108	66	1.60	83%	0.27	1.92	35%	1.24
109	71	1.39	83%	0.24	1.07	35%	0.69
110	66	1.81	83%	0.31	1.10	35%	0.71
111	66	1.20	83%	0.20	1.50	35%	0.97
112	71	1.66	83%	0.28	1.31	35%	0.85
113	71	1.66	83%	0.28	1.32	35%	0.85
114	49	2.60	83%	0.44	2.31	71%	0.68
115	75	2.59	83%	0.44	1.88	0%	1.88
116	50	2.08	83%	0.35	1.68	0%	1.68
117	71	1.42	83%	0.24	0.73	35%	0.47
118	72	1.45	83%	0.25	0.62	0%	0.62
119	45	1.40	83%	0.24	0.96	0%	0.96
120	51	1.86	83%	0.32	1.42	66%	0.48
121	47	1.49	83%	0.25	1.17	0%	1.17
122	72	1.55	83%	0.26	0.96	0%	0.96
123	48	1.72	83%	0.29	1.02	0%	1.02
124	29	1.91	83%	0.33	1.52	30%	1.07
125	46	2.36	83%	0.40	1.89	85%	0.29
126	31	2.07	83%	0.35	1.54	55%	0.69
127	73	2.19	83%	0.37	1.76	0%	1.76
128	28	1.34	83%	0.23	0.93	41%	0.55
129	28	1.73	83%	0.29	1.35	41%	0.79
130	27	1.68	83%	0.29	0.86	58%	0.36
131	27	2.15	83%	0.37	1.51	58%	0.63
132	30	2.30	83%	0.39	1.78	48%	0.92
133	74	3.30	83%	0.56	2.84	0%	2.84
134	74	-	-	-	-	-	-
135	28	1.01	83%	0.17	0.55	41%	0.32
136	22	0.85	83%	0.14	0.92	41%	0.54
137	23	0.91	83%	0.16	0.82	41%	0.48
138	27	2.48	83%	0.42	1.84	58%	0.78
139	28	1.59	83%	0.27	1.30	41%	0.76
140	27	2.96	83%	0.50	2.22	58%	0.94
141	26	1.75	83%	0.30	1.52	41%	0.89
142	23	1.12	83%	0.19	1.20	41%	0.71
143	28	1.21	83%	0.21	0.82	41%	0.48
144	21	0.81	83%	0.14	0.80	47%	0.43

Model Subwatershed	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
145	21	1.28	83%	0.22	1.48	47%	0.79
146	21	1.00	83%	0.17	1.07	47%	0.57
147	21	1.41	83%	0.24	1.65	47%	0.88
148	28	1.15	83%	0.20	1.00	41%	0.59
149	28	1.01	83%	0.17	0.44	41%	0.26
150	23	1.31	83%	0.22	1.35	41%	0.79
151	28	1.71	83%	0.29	0.49	41%	0.29
152	28	1.52	83%	0.26	0.32	41%	0.19
153	28	1.64	83%	0.28	0.59	41%	0.34
154	24	1.41	83%	0.24	1.20	47%	0.64
155	32	2.63	83%	0.45	1.73	51%	0.84
156	25	1.96	83%	0.33	1.80	41%	1.06
157	28	2.45	83%	0.42	1.96	41%	1.16
158	10	1.93	83%	0.33	2.27	47%	1.21
159	24	1.38	83%	0.23	1.40	47%	0.75
160	8	2.14	83%	0.37	2.30	47%	1.22
161	24	1.69	83%	0.29	1.72	47%	0.92
162	87	3.95	76%	0.94	2.65	66%	0.91
163	25	2.28	83%	0.39	2.15	41%	1.27
164	24	1.58	83%	0.27	1.65	47%	0.88
165	10	1.56	83%	0.27	1.92	47%	1.03
166	10	1.98	83%	0.34	1.93	47%	1.03
167	19	2.97	45%	1.62	2.15	72%	0.61
168	20	2.78	0%	2.78	2.42	41%	1.42
169	20	4.10	0%	4.10	2.44	41%	1.44
170	35	2.84	83%	0.48	2.08	77%	0.47
171	33	2.49	83%	0.42	1.54	44%	0.86
172	10	1.74	83%	0.30	1.93	47%	1.03
173	21	1.52	83%	0.26	1.58	47%	0.84
174	79	4.30	80%	0.84	2.84	78%	0.61
175	34	2.62	83%	0.45	1.41	16%	1.19
176	24	1.51	83%	0.26	1.59	47%	0.85
177	88	2.68	83%	0.46	1.38	0%	1.38
178	20	4.39	0%	4.39	2.51	41%	1.48
179	88	2.55	83%	0.43	0.52	0%	0.52
180	10	1.58	83%	0.27	1.69	47%	0.90
181	9	1.90	88%	0.22	1.94	47%	1.03
182	43	2.90	83%	0.49	1.34	43%	0.76
183	16	2.51	83%	0.43	1.93	47%	1.03
184	44	3.24	83%	0.55	2.35	70%	0.70
185	17	4.12	68%	1.31	2.73	87%	0.36
186	18	4.24	59%	1.75	2.83	82%	0.51
187	16	1.42	83%	0.24	1.27	47%	0.68
188	39	2.87	83%	0.49	2.34	65%	0.81
189	15	1.77	83%	0.30	1.60	47%	0.85
190	11	4.29	72%	1.19	2.92	54%	1.36
191	42	2.51	83%	0.43	1.17	17%	0.97
192	7	1.81	88%	0.21	1.82	47%	0.97
193	15	1.61	83%	0.28	1.68	47%	0.89
194	15	2.37	83%	0.41	2.01	47%	1.07

Model Subwatershed	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
195	14	2.44	83%	0.42	1.97	47%	1.05
196	36	3.09	83%	0.53	2.26	85%	0.35
197	43	2.77	83%	0.47	1.60	43%	0.91
198	38	2.61	83%	0.45	1.92	24%	1.45
199	42	2.36	83%	0.40	1.03	17%	0.86
200	40	3.64	83%	0.62	2.63	47%	1.39
201	12	3.94	83%	0.68	2.56	86%	0.36
202	2	2.74	79%	0.57	2.72	47%	1.45
203	37	2.74	85%	0.41	1.82	82%	0.32
204	41	3.47	83%	0.59	2.41	74%	0.62
205	4	2.81	88%	0.33	2.68	47%	1.43
206	1	1.68	88%	0.20	1.71	47%	0.91
207	13	3.24	83%	0.56	2.32	77%	0.53
208	3	3.41	79%	0.71	3.29	79%	0.69
209	4	1.99	88%	0.24	1.99	47%	1.06
210	4	1.43	88%	0.17	1.18	47%	0.63
211	4	1.57	88%	0.19	1.31	47%	0.70
212	4	1.78	88%	0.21	1.25	47%	0.67
213	7	1.95	88%	0.23	1.50	47%	0.80
214	4	1.39	88%	0.16	1.19	47%	0.63
215	7	2.25	88%	0.27	2.15	47%	1.15
216	7	2.45	88%	0.29	2.56	47%	1.36
217	5	3.14	74%	0.83	2.64	64%	0.96
218	6	2.31	88%	0.27	2.33	47%	1.24
219	56	1.78	20%	1.42	1.69	35%	1.10
220	86	2.36	55%	1.06	2.38	36%	1.52
221	85	2.00	90%	0.20	1.79	35%	1.16
222	83	4.30	34%	2.83	2.84	79%	0.60
223	84	3.24	54%	1.49	2.32	75%	0.58

Table 3. Agricultural total phosphorus (TP) and total suspended solids (TSS) yield targets for HUC12s. Targets are comparable to outputs from SnapPlus and correspond to attainment of TMDL agricultural load allocations. The targets are calculated from baseline yields for each HUC12 and percent reductions each TMDL Subbasin that intersects the HUC12. The TMDL subbasins that are listed are those that have at least 10% of their area within the HUC12 in which they are nested, or 10% of the overall HUC12 area.

HUC12	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
040302010101	5	3.24	74%	0.85	2.64	63%	0.97
040302010102	5,6	2.78	79%	0.58	2.56	57%	1.10
040302010201	1	1.34	88%	0.16	1.58	47%	0.84
040302010202	4	2.80	88%	0.33	2.67	47%	1.41
040302010203	2,3	3.17	80%	0.64	3.07	68%	0.98
040302010204	4	1.77	88%	0.21	1.24	47%	0.66
040302010205	1,4	1.74	88%	0.20	1.63	47%	0.87
040302010301	10	1.95	83%	0.33	2.29	47%	1.22
040302010302	8	2.14	83%	0.36	2.29	47%	1.22
040302010303	10	2.00	83%	0.34	1.94	47%	1.04
040302010304	10	1.63	83%	0.28	1.88	47%	1.00
040302010401	12	3.87	83%	0.67	2.48	86%	0.36
040302010402	11,12	4.10	81%	0.78	2.74	80%	0.54
040302010501	13,84	3.21	83%	0.56	2.31	77%	0.54
040302010502	14	2.69	83%	0.46	2.16	47%	1.13
040302010503	15	2.37	83%	0.41	2.02	47%	1.07
040302010504	14,15	1.66	83%	0.28	1.53	47%	0.81
040302010601	7	2.27	88%	0.27	2.17	47%	1.16
040302010602	7	2.45	88%	0.29	2.55	47%	1.36
040302010603	7	1.82	88%	0.21	1.82	47%	0.97
040302010604	9	1.90	88%	0.22	1.93	47%	1.03
040302010605	16	2.22	83%	0.38	1.77	47%	0.94
040302010701	21	0.80	83%	0.14	0.81	47%	0.43
040302010702	21	1.27	83%	0.22	1.47	47%	0.78
040302010703	21	1.00	83%	0.17	1.05	46%	0.56
040302010704	21	1.48	83%	0.25	1.52	47%	0.81
040302010801	21,22,48	0.88	83%	0.15	1.04	35%	0.67
040302010802	22	1.04	83%	0.18	1.12	40%	0.67
040302010803	23	1.11	83%	0.19	1.19	41%	0.70
040302010804	22,23,48	0.84	83%	0.14	0.86	32%	0.59
040302010805	28	1.15	83%	0.20	1.00	41%	0.59
040302010806	23,28	1.27	83%	0.22	1.18	41%	0.69
040302010901	19,20,87	3.86	58%	1.61	2.55	62%	0.96

HUC12	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
040302010902	17,18,20,79,83	3.85	27%	2.79	2.67	56%	1.17
040302011001	27	2.54	83%	0.43	1.92	58%	0.81
040302011002	27	2.76	83%	0.47	2.04	58%	0.86
040302011101	24	1.41	83%	0.24	1.46	46%	0.78
040302011102	24	1.58	83%	0.27	1.66	47%	0.88
040302011103	19,25	1.97	81%	0.37	1.81	43%	1.04
040302011104	28	1.12	83%	0.19	0.68	41%	0.40
040302011105	28	1.00	83%	0.17	0.56	40%	0.34
040302011106	24,26,28	2.02	83%	0.34	1.62	42%	0.93
040302011107	28,29	1.70	83%	0.29	1.32	39%	0.80
040302011201	31	2.09	83%	0.36	1.55	50%	0.78
040302011202	73	2.00	83%	0.34	1.57	1%	1.57
040302011203	73	2.09	83%	0.36	1.66	0%	1.66
040302011204	30	2.32	83%	0.40	1.79	47%	0.95
040302011205	29,73,74	2.41	83%	0.41	1.98	4%	1.89
040302020101	78	1.85	34%	1.23	1.41	35%	0.92
040302020102	77	3.55	34%	2.35	1.89	35%	1.23
040302020103	77	3.18	34%	2.09	2.00	35%	1.30
040302020104	80	2.92	83%	0.50	2.34	35%	1.51
040302020105	80	1.90	83%	0.33	1.45	35%	0.94
040302020106	80	1.66	83%	0.29	1.71	35%	1.10
040302020201	76,80	1.74	83%	0.30	1.18	35%	0.76
040302020202	80	4.20	83%	0.73	2.21	35%	1.43
040302020203	55	2.90	83%	0.49	2.82	35%	1.82
040302020204	55	2.82	83%	0.48	2.22	35%	1.43
040302020205	55	3.06	83%	0.52	2.15	35%	1.39
040302020206	55	3.04	83%	0.52	1.60	35%	1.03
040302020301	55	2.20	83%	0.37	1.44	35%	0.93
040302020302	55	3.32	83%	0.56	1.87	35%	1.21
040302020303	55	4.58	83%	0.78	2.72	35%	1.76
040302020304	55	2.47	83%	0.42	1.94	35%	1.25
040302020305	55	6.32	83%	1.07	3.93	35%	2.53
040302020401	55	5.61	83%	0.95	3.43	35%	2.21
040302020402	55	5.89	83%	1.00	3.49	35%	2.25
040302020403	55	3.57	83%	0.61	1.94	35%	1.25
040302020404	55	1.92	83%	0.33	2.00	35%	1.29
040302020501	55	4.91	83%	0.83	3.25	35%	2.10
040302020502	55	2.52	83%	0.43	1.71	35%	1.11

HUC12	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
040302020503	55	5.32	83%	0.90	3.21	35%	2.07
040302020504	55	1.12	83%	0.19	1.32	35%	0.85
040302020505	55	1.28	83%	0.22	1.34	35%	0.86
040302020601	54,56	2.14	65%	0.75	1.93	35%	1.25
040302020602	56	0.92	83%	0.16	1.23	35%	0.80
040302020603	56	1.70	83%	0.29	1.67	35%	1.08
040302020701	55	4.12	83%	0.70	1.53	35%	0.98
040302020702	55	1.28	83%	0.22	1.10	35%	0.71
040302020801	53	1.78	83%	0.30	1.47	35%	0.95
040302020802	53	1.97	83%	0.34	1.67	35%	1.08
040302020803	53	1.77	83%	0.30	1.55	35%	1.01
040302020804	53	2.11	83%	0.36	1.94	35%	1.25
040302020805	89	1.70	83%	0.29	1.39	35%	0.90
040302020806	89	2.22	83%	0.38	1.86	35%	1.20
040302020807	53	1.47	83%	0.25	1.11	35%	0.72
040302020901	55,67	1.62	83%	0.28	1.45	35%	0.94
040302020902	57,67	1.68	67%	0.56	1.44	35%	0.93
040302020903	67	1.50	83%	0.25	1.08	36%	0.69
040302020904	67	1.13	83%	0.19	0.90	39%	0.55
040302021001	58	3.25	83%	0.55	2.10	35%	1.36
040302021002	58	2.22	83%	0.38	1.63	35%	1.05
040302021003	58	2.52	83%	0.43	1.71	35%	1.11
040302021004	58	2.42	83%	0.41	1.66	35%	1.07
040302021005	58	2.48	83%	0.42	1.88	35%	1.22
040302021006	58	2.02	83%	0.35	1.59	35%	1.03
040302021007	58	2.16	83%	0.37	1.86	35%	1.20
040302021101	60	2.06	83%	0.35	1.79	42%	1.04
040302021102	60	2.25	83%	0.38	1.70	42%	0.99
040302021103	60	1.89	83%	0.32	1.32	42%	0.77
040302021201	59	2.06	83%	0.35	1.60	35%	1.03
040302021202	59	1.84	83%	0.31	1.70	35%	1.10
040302021203	59	1.53	83%	0.26	1.61	35%	1.04
040302021204	59	1.51	83%	0.26	1.35	35%	0.87
040302021301	70	1.76	83%	0.30	1.45	69%	0.44
040302021302	70	2.07	83%	0.35	1.39	74%	0.36
040302021303	64,70	1.76	83%	0.30	1.29	53%	0.60
040302021304	68,70	1.83	83%	0.31	1.21	67%	0.40
040302021401	52	2.52	83%	0.43	2.21	80%	0.45

HUC12	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
040302021402	52	2.48	83%	0.42	2.26	79%	0.46
040302021403	68	1.89	83%	0.32	1.39	36%	0.89
040302021404	69,82	2.59	78%	0.57	2.10	52%	1.01
040302021501	63,81	1.87	83%	0.32	1.45	45%	0.79
040302021502	81	2.53	83%	0.43	1.85	47%	0.99
040302021503	81	2.38	83%	0.41	1.65	46%	0.89
040302021504	81	2.09	83%	0.36	1.57	47%	0.84
040302021601	81	2.40	83%	0.41	1.56	46%	0.84
040302021602	81	2.25	83%	0.38	1.41	47%	0.75
040302021603	81	1.97	83%	0.34	1.55	47%	0.83
040302021604	81	2.42	83%	0.41	1.41	47%	0.75
040302021605	81	1.67	83%	0.29	1.24	47%	0.66
040302021701	62,81	1.84	79%	0.39	1.45	47%	0.77
040302021702	81	1.85	83%	0.32	1.36	47%	0.73
040302021703	62,81	1.90	82%	0.33	1.37	46%	0.73
040302021704	81	2.05	83%	0.35	1.47	47%	0.78
040302021705	61	1.94	83%	0.33	1.42	88%	0.17
040302021801	65,66	2.55	79%	0.52	2.93	35%	1.90
040302021802	66	2.12	83%	0.36	2.34	35%	1.52
040302021803	66,86	2.32	83%	0.39	2.47	35%	1.60
040302021804	66	2.58	83%	0.44	2.38	36%	1.53
040302021805	66	2.09	83%	0.36	2.41	35%	1.56
040302021806	66	1.57	83%	0.27	1.98	35%	1.28
040302021807	66	1.19	83%	0.20	1.50	35%	0.97
040302021808	66,85	1.82	83%	0.31	1.69	35%	1.10
040302021809	66	2.41	83%	0.41	2.05	36%	1.32
040302021810	66	1.77	83%	0.30	1.18	35%	0.76
040302021901	71	2.08	83%	0.36	1.69	36%	1.07
040302021902	71	1.64	83%	0.28	1.16	38%	0.72
040302021903	71	1.65	83%	0.28	1.31	35%	0.85
040302021904	71	1.67	83%	0.28	1.26	35%	0.82
040302021905	71	1.04	83%	0.18	0.62	35%	0.40
040302021906	71	1.46	83%	0.25	0.70	35%	0.45
040302022001	47	1.24	83%	0.21	1.37	3%	1.33
040302022002	45,47	1.02	83%	0.17	0.87	1%	0.86
040302022003	47,72	1.84	83%	0.31	1.01	0%	1.01
040302022004	48	1.05	83%	0.18	1.14	0%	1.14
040302022005	48	1.61	83%	0.27	0.87	1%	0.86

HUC12	TMDL Subbasin	TP			TSS		
		Baseline (lbs./ac/yr)	% Reduction	Target (lbs./ac/yr)	Baseline (tons/ac/yr)	% Reduction	Target (tons/ac/yr)
040302022006	28,48	2.27	83%	0.39	1.00	5%	0.94
040302022101	50	2.57	83%	0.44	2.23	1%	2.20
040302022102	49,50	1.89	83%	0.32	1.49	19%	1.20
040302022103	72	1.13	83%	0.19	0.82	1%	0.81
040302022104	72	1.72	83%	0.29	1.09	0%	1.09
040302022105	51	1.85	83%	0.32	1.41	65%	0.49
040302022106	71,72	1.67	83%	0.28	0.97	5%	0.92
040302030101	75	2.65	83%	0.45	1.96	0%	1.96
040302030102	75	2.38	83%	0.41	1.68	1%	1.67
040302030103	32,33,34,75,88	2.55	83%	0.43	1.56	22%	1.22
040302030201	35,44	3.34	83%	0.57	2.47	72%	0.70
040302030202	36,37,43	2.90	83%	0.48	1.95	71%	0.56
040302030203	40,41,42,43,44	2.91	83%	0.50	1.50	46%	0.80
040302030204	44,88	2.85	83%	0.49	1.97	64%	0.72
040302030301	38,39,75	2.71	83%	0.46	1.99	33%	1.33
040302030302	75	3.05	83%	0.52	2.28	0%	2.27
040302030303	46,75	2.58	83%	0.44	2.08	13%	1.81
040302030304	75	2.15	83%	0.37	1.51	0%	1.51
040302030401	75	2.45	83%	0.42	1.17	0%	1.17