

Nine Key Element Watershed Plan
For The
Lower Yellow River Watershed
and
Moon Bay of Lake Wissota

Chippewa County, Wisconsin

November 16, 2021



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For The
Lower Yellow River Watershed
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Moon Bay of Lake Wissota
Chippewa County, Wisconsin**

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Executive Summary

Moon Bay is a eutrophic embayment of Lake Wissota which is an impoundment of the Chippewa River located near Chippewa Falls, Wisconsin.

This plan was requested by the community through the public participation component of the Chippewa County Land and Water Resource Management Plan development process as a logical extension of the Little Lake Wissota Stewardship Project initiative.

The purpose of this watershed plan is to:

- 1) Compile and inventory published research and inventory modeling efforts that have been conducted in the Yellow River/ Moon Bay Watershed
- 2) Establish a management strategy and activities schedule, that will be used to systematically implement the Lake Wissota Stewardship Project to achieve sediment and phosphorus reduction goals for Moon Bay in a 20 year timeframe.
- 3) Meet EPA and WDNR requirements to be recognized as a 9 Key Element Watershed Plan
- 4) Facilitate access to State and Federal grant opportunities
- 5) To establish project implementation in a 20 year timeframe with opportunities for 5 year plan revisions to access if time and resources are adequate to achieve water quality goals

Modeling shows that Non-Point pollution sources are a direct function of Land Use and Land Cover. The Land use and associated land cover types have been categorized in the Yellow River Watershed as primarily forest, agricultural fields, and wetlands. A majority of non-point source phosphorus loading, as modeled in STEPL modeling later in this document, comes from agricultural sources.

Agricultural BMPs will be prioritized and addressed by working in the lowlands by installing stream buffers and wetland restorations, but also working in the uplands to provide cost sharing for reduced tillage, cover crop, and increased residue farming practices in order to bring farms into NR151 compliance.

The Lake Wissota Stewardship Project will apply agricultural best management practices in the watershed over the next 20 years (2021-2041) to meet a pollution reduction goal of 54% as identified as a target in a Wisconsin Department of Natural Resources Memo.

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I. INTRODUCTION

1.1 Characteristics of the Moon Bay and Yellow River Watershed

Moon Bay is a eutrophic embayment of Lake Wissota which is an impoundment of the Chippewa River located near Chippewa Falls, Wisconsin. The bay has an average summer hydraulic residence time of ~9 days.

For management purposes, Moon Bay has been classified by DNR and USCOE studies as a water body hydrologically separate from Lake Wissota, even though they share the same Wisconsin Waterbody Identification Code (2152800).

This plan was requested by the community through the public participation component of the Chippewa County Land and Water Resource Management Plan development process as a logical extension of the Little Lake Wissota Stewardship Project initiative.

The contributing watershed to Moon Bay is the Yellow River Watershed.

This plan is for the Lower Yellow River Watershed (HUC10 0705000503)

The Yellow River Watershed is contained within the Lower Chippewa River Watershed (HUC8 07050005).

The Lower Yellow River Watershed contains 6 HUC12 watersheds:

Lake Wissota Watershed (HUC12 070500050308)

Little Drywood Watershed (HUC12 070500050303)

Big Drywood Watershed (HUC12 070500050304)

Lotz Creek Watershed (HUC12 070500050305)

Pike Creek Watershed (HUC12 070500050301)

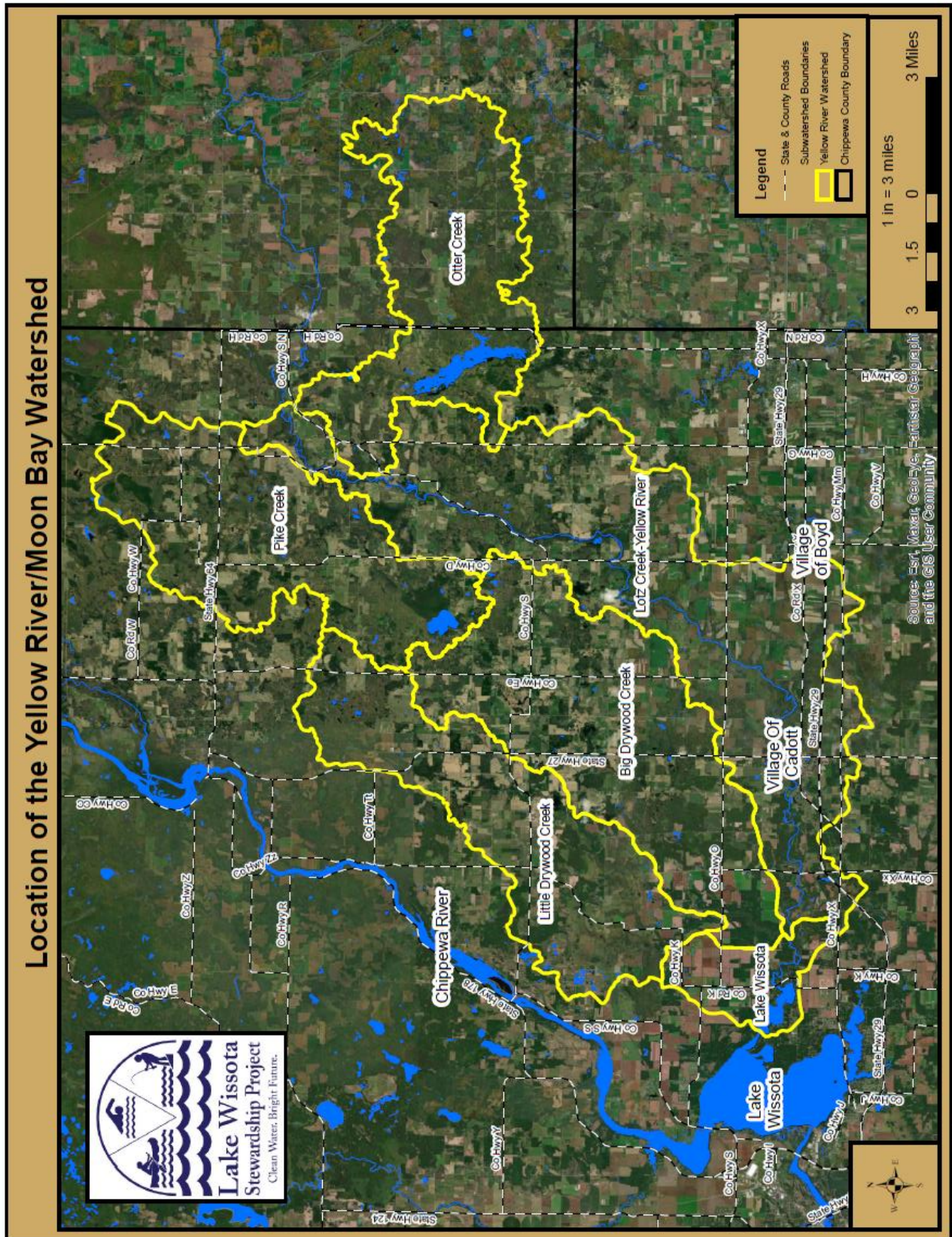
Otter Creek Watershed (HUC12 070500050302)

Moon Bay (Waters ID 1521808) was placed on the Wisconsin 303(d) impaired waters list on 4/1/2008 due to eutrophication from total phosphorus loading. The Yellow River is the primary source of surface water inflow to Moon Bay. Land use and land cover in the watershed is primarily a mix of dairy operations, cash grain operations, deciduous forest, and wetland.

There is not a Total Maximum Daily Load (TMDL) developed for Moon Bay, but there are multiple studies that outline water quality goals and define pollution load reductions necessary to meet those goals for the watershed. Wisconsin Department of Natural Resources has determined that the total phosphorus load to Moon Bay is estimated at 70,535lbs/year and that a 54% reduction in the watershed phosphorus load is necessary to meet water quality goals (i.e., reduce to Moon Bay to 49 ug/L TP; achieve 30% or fewer summer days with chlorophyll > 20 ug/L). Such reductions will help restore Moon Bay's beneficial uses in the summer months: full body contact – swimming – and boating.

Map 1 shows the location of Lake Wissota and the contributing Lower Yellow River watershed.

Map 1 shows the location of Moon Bay and the Lower Yellow River Watershed



1.2 Purpose of Document

The purpose of this watershed plan is to:

- 1) Compile and inventory published research and inventory modeling efforts that have been conducted in the Yellow River/ Moon Bay Watershed
- 2) Establish a management strategy and activities schedule, that will be used to systematically implement the Lake Wissota Stewardship Project to achieve phosphorus reduction and water quality goals for Moon Bay in a 20-year timeframe.
- 3) Meet EPA and WDNR requirements to be recognized as a 9 Key Element Watershed Plan
- 4) Facilitate access to State and Federal grant opportunities
- 5) To establish project implementation in a 20-year timeframe with opportunities for 5-year plan revisions if staff and financial resources are adequate to meet plan milestones and achieve water quality goals

Figure 1 shows the Lake Wissota Stewardship Project logo developed in 2017.

Figure 1



1.3 Project History

Little Lake Wissota, located immediately south of Moon Bay, is also a eutrophic embayment of Lake Wissota that has also been the focus of extensive studies. In 1998, Little Lake Wissota was placed on the Wisconsin 303d impaired waters list, with a high priority ranking due to eutrophication and pH criteria exceedances. In January 2010, the Wisconsin DNR established a TMDL for Little Lake Wissota. The goal of this TMDL is to reduce levels of phosphorus and sediment loading and decrease the extent and severity of summer algal blooms in Little Lake Wissota. The TMDL was approved by the USEPA in April 2010.

In 2009, The Little Lake Wissota Stewardship Project was established as a community effort to encourage water conservation and improve the water quality of Little Lake Wissota using the established TMDL. It was a short-term watershed management project, sponsored by the Jacob Leinenkugel Brewing Company and Chippewa County. It was supported through direct community contributions by area residents, businesses, public agencies, and civic organizations.

The stated objectives of the Little Lake Wissota Stewardship Project were to:

- 1) Serve as a bridge to a full-scale watershed level plan implementation
- 2) Reduce phosphorus & sediment loads to target levels
- 3) Increase the number of clean water days during summer months
- 4) Continue to sponsor & evaluate a new voluntary public/private business model for lake & watershed management

In 2017, the Lake Wissota Improvement and Protection Association and the Chippewa County Department of Land Conservation and Forest Management agreed to extend the project through 2023 to continue to:

- 1) Pursue sediment and phosphorus reduction goals outlined in the Little Lake Wissota 2010 TMDL, and to
- 2) Expanded the project area to include the Lower Yellow River watershed to begin to address causes and sources of nonpoint pollution to Moon Bay.

1.4 Prior Plans and Watershed Studies

1. The Lower Chippewa River Basin Water Quality Management Plan, (1989), states that

“Water Resource Management should conduct an assessment of the phosphorus and algae relationships in the Yellow River and Paint Creek Bays. This assessment should estimate the decrease needed in phosphorus loadings to improve water quality. The feasibility of achieving this reduction in phosphorus loading through Agricultural Non-Point source and Urban Point Source water pollution controls should be determined.”

2. An Internal DNR Memo (2018), included in the appendix of this plan, states that:

“Moon Bay has been assessed and listed [in 2016] separately for phosphorus related impairments. The summer mean phosphorus in Moon Bay is 106 µg/L with a mean chlorophyll of 41 µg/L. Because of the short residence time and mixed nature of Moon Bay, it is recommended that water quality goals be based on algal bloom frequency in Moon Bay (scenario 4) . . . “The percent reduction given in [included in this plan] are based on the total load, a portion of which is derived from natural background sources and likely uncontrollable. Table 2 categorized the various land uses by whether or not they are controllable. Based on the classification and export coefficients in table 2, a 72% reduction from the controllable sources would be needed to meet the total load reduction of 54%.”

3. The 2020-2029 Chippewa County Land & Water Resource Management Plan states the Chippewa County LCFM will work,

“With the Lake Wissota Improvement & Protection Association, administer the Lake Wissota Stewardship Project as the water resource management mechanism to account for, reduce, and monitor point and nonpoint source pollutant loads to Little Lake Wissota, and to meet any established TMD pollution load reduction goals and water quality management objectives for Moon Bay of Lake Wissota.”

4. The 2001 “State of the Chippewa River Basin” document states that agencies should:

“Conduct a comprehensive fisheries and habitat survey of the Yellow River and its tributaries from the dam at Chequamegon Waters Flowage downstream to Lake Wissota, including the Paint Creek and Dry wood Creek sub watersheds. The study will include a baseline monitoring component for wadable streams, a baseline monitoring project for non-wadable streams, and a comprehensive, warmwater streams survey. See Appendix 2, Basin Monitoring Schedules and Plans for more detailed information.”

II. The Existing LWSP Program Framework

1.1 The Existing Lake Wissota Stewardship Project Program Framework

The Lake Wissota Stewardship Project is a public/private partnership. The project is co-sponsored by the Lake Wissota Improvement & Protection Association (LWIPA) and the Chippewa County Land Conservation & Forest Management Committee (LCFM). The project is being implemented to improve water quality in Lake Wissota by reducing runoff pollution from its contributing watersheds.

The Lake Wissota Stewardship Project has four operating components: administrative activities, community outreach, “conservation on the land” to reduce runoff pollution, and water quality monitoring.

The LWSP is overseen by an advisory group called the “Implementation team.” The implementation group consists of representatives from the LWIPA, DNR, Wisconsin Farmers Union, and LCFM. The team meets monthly to guide the daily work of the project manager.

Administrative activities include writing and administering grants, developing watershed plans, watershed program tracking, budgeting, and work planning.

The community outreach component includes the information and education component, the solicitation of funds, orchestrating volunteers, hosing events, and booths at community events. The LWSP has an annual contract with Wisconsin Farmers Union Foundation to develop and administer a watershed-based water quality curriculum to campers at Kamp Kenwood on Lake Wissota.

The conservation on the land portion of the project is the main component of the project. LWSP and LCFM staff work with private landowners to install upland, lowland, and structural conservation best management practices on their land to improve water quality.

The Monitoring component of the project involves stream, lake, and dock monitoring. Stream monitoring is administered under the DNR WAV Program. Lake monitoring is administered under the DNR CLMN Program. The LWSP has an annual MOU with a local Boy scout troop to conduct lake monitoring activities. Beginning in 2021, the LWSP installed a USGS stream gauge on Drywood Creek of the Yellow River Watershed.

Element 1 - The Causes and Sources of Pollution in the Yellow River Watershed

EPA guidance requires that a 9-Key Element Plan Provides:

“An identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve needed load reductions, and any other goals identified in the watershed plan. Sources that need to be controlled should be identified at the significant subcategory level along with estimates of the extent to which they are present in the watershed.”
(EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters)

1.1 The Existing Source Causes, Sources, and Estimates of Pollution

Watershed based management approaches to control water pollution, using Total Daily Maximum Loads (TMDL) pollution reduction, or other targets, require control of both point and non-point sources. A majority of Yellow River watershed non-point sources of phosphorus loading, determined using the STEPL model and shown later in this plan, comes from controllable agricultural sources.

1.10 Point Sources

The Cadott Wastewater Treatment Facility (Permit # 0023515) is the only WPDES permitted point source pollution source in the Yellow River Watershed. All remaining sources are nonpoint. Moon Bay is not covered by the Chippewa Falls Urban Area WPDES Stormwater Permit.

1.11 Non-Point Sources

Non-Point pollution sources are a direct function of a watershed’s land use and land cover. The land use and associated land cover types in the Yellow River Watershed were determined using the USDA National Land Cover Dataset, and consist of primarily forest, agricultural fields, and wetlands. The STEPL Model was applied to determine the Yellow River agricultural nonpoint pollutant loads. The total estimated P load to Moon Bay from STEPL is 90969 lbs. When compared, STEPL results were similar to a previous watershed pollutant load estimate by DNR in 2018, which utilized a simple export coefficient approach to estimate of the nonpoint phosphorus loads coming from various sources throughout the Moon Bay watershed at 70,535 lbs./year.

Map 2 Shows the Land Use and Land Cover Data for the Lower Yellow River Watershed

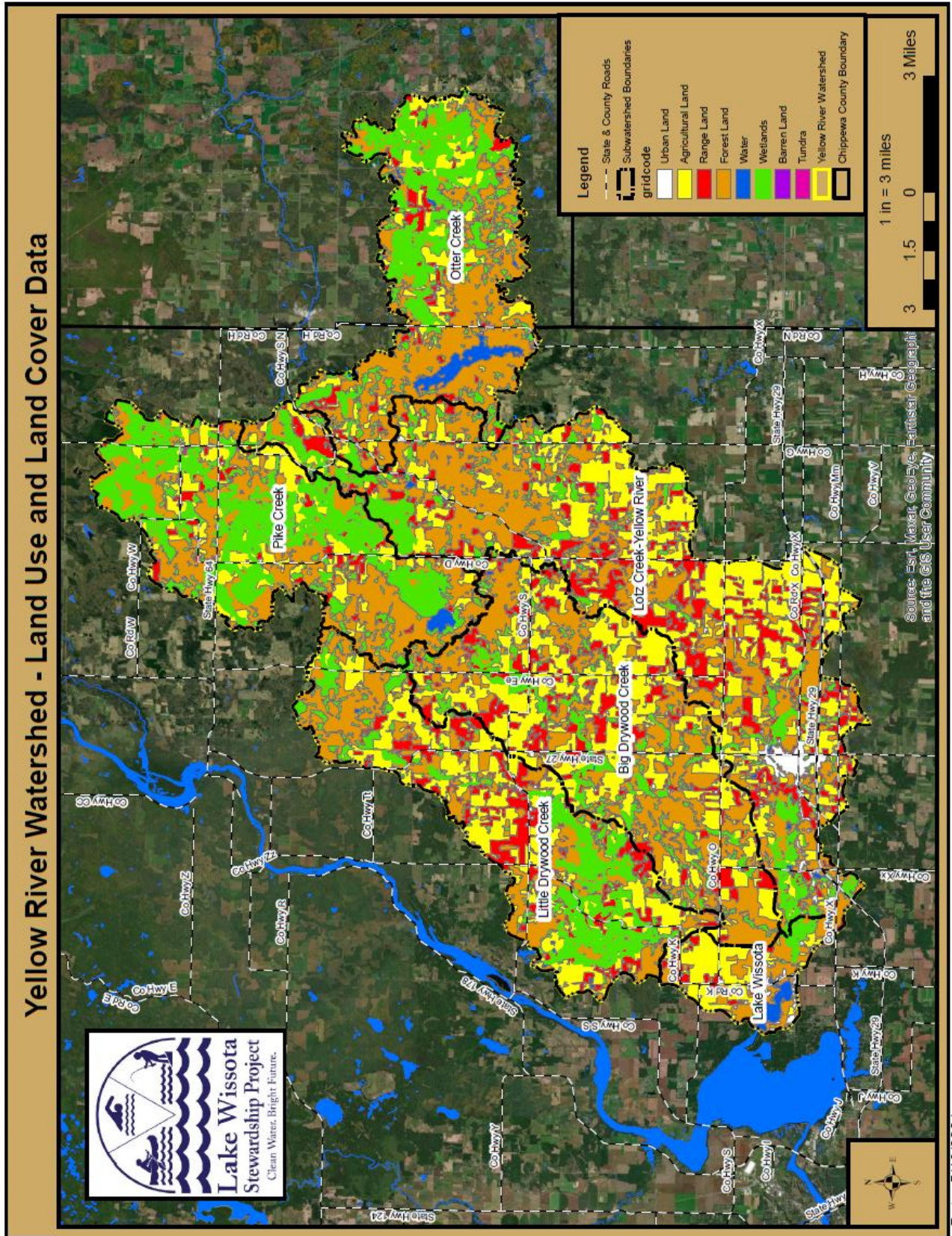


Table 1: Land Use / Land Cover Acreages in the Yellow River Watershed

Yellow River Land Use / Land Cover Acreages by Sub-Watershed								
Sub-Watershed	Urban Acres	Agricultural Acres	Range Acres*	Forest Acres	Water Acres	Wetland Acres	Barren Acres	Tundra Acres
Lake Wissota	300	1788	401	1625	320	275	0	0
Lotz Creek/Yellow River	1503	13267	8070	13996	181	4554	11	4
Big Drywood	305	9458	4653	9131	37	3043	5	2
Little Drywood	218	6112	3720	6489	66	4407	1	18
Pike Creek	90	3300	1320	8896	211	8030	0	16
Otter Creek	124	2828	1502	9552	768	5772	0	0

* = Range Acres consist of predominantly scrub grasses, forbs or shrubs, some of which may be periodically used by dairy or beef operations. Range acres were identified as pastureland acres within Yellow River watershed STEPL modeling.

In January 2020, land inventories were conducted to provide a basis for watershed planning and input for modeling efforts.

Map 3 shows the distribution of cash grain and livestock agriculture in the Yellow River watershed

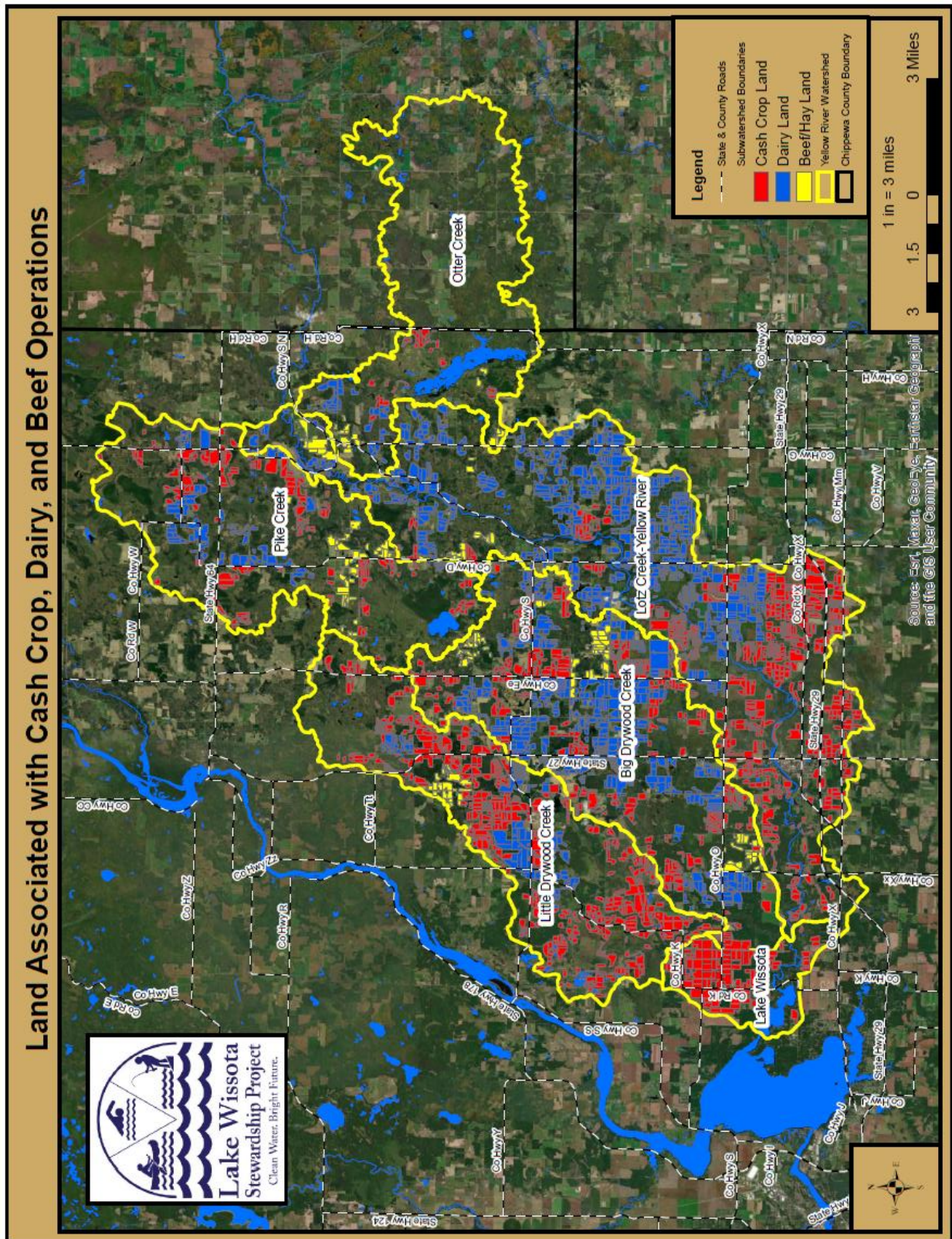


Table 2: Table showing Land Use Rotation Associations in Yellow River Watershed

Sub-Watershed	Dairy Rotation Acres	Beef / Hay Rotation Acres*	Cash Crop Rotation Acres
Lake Wissota	0	0	1807
Little Drywood	1224	245	5360
Big Drywood	5349	704	3545
Lotz Creek Yellow River	7567	342	5927
Pike Creek	1139	450	1910
Otter Creek	386	190	253
Totals:	15665	1931	18802

* = Does not include Range Acres

Map 4 shows the distribution and location of feedlots in the Lower Yellow River watershed.

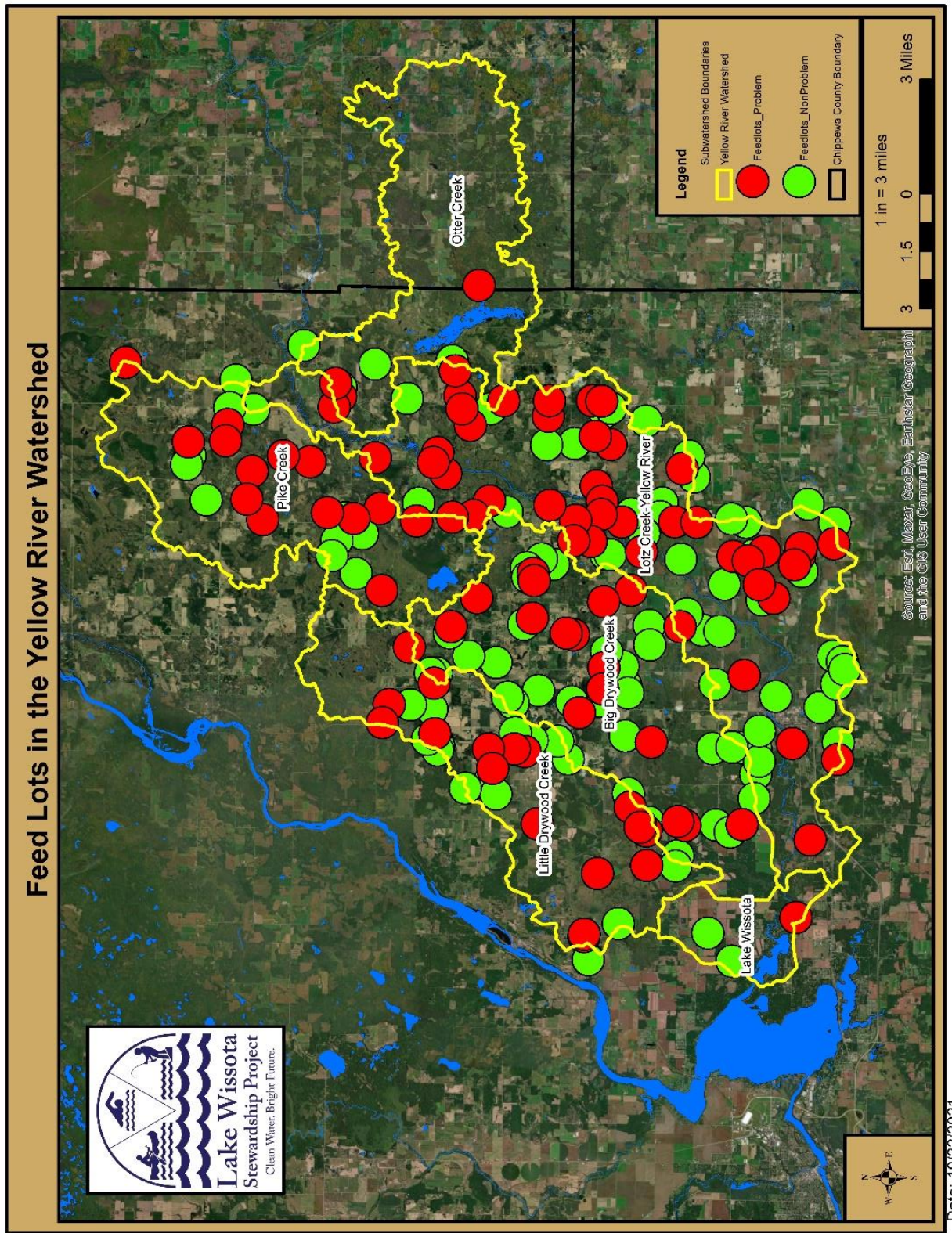


Table 3: Number of Feedlots, Acres of Higher Risk and Lower Risk Feedlots by Sub watershed

Watershed	Number of Problem Feedlots	Acres Higher Risk Feedlots*	Number Lower Risk Feedlots*	Acres of Non-Problem* Feedlots
Lake Wissota	1	1.1	2	4.3
Little Drywood	18	45.7	14	24.7
Big Drywood	16	62.4	13	51.9
Lotz Creek/Yellow River	44	129.4	35	55.4
Pike Creek	15	34.4	10	12.8
Otter Creek	3	17.4	4	5.9

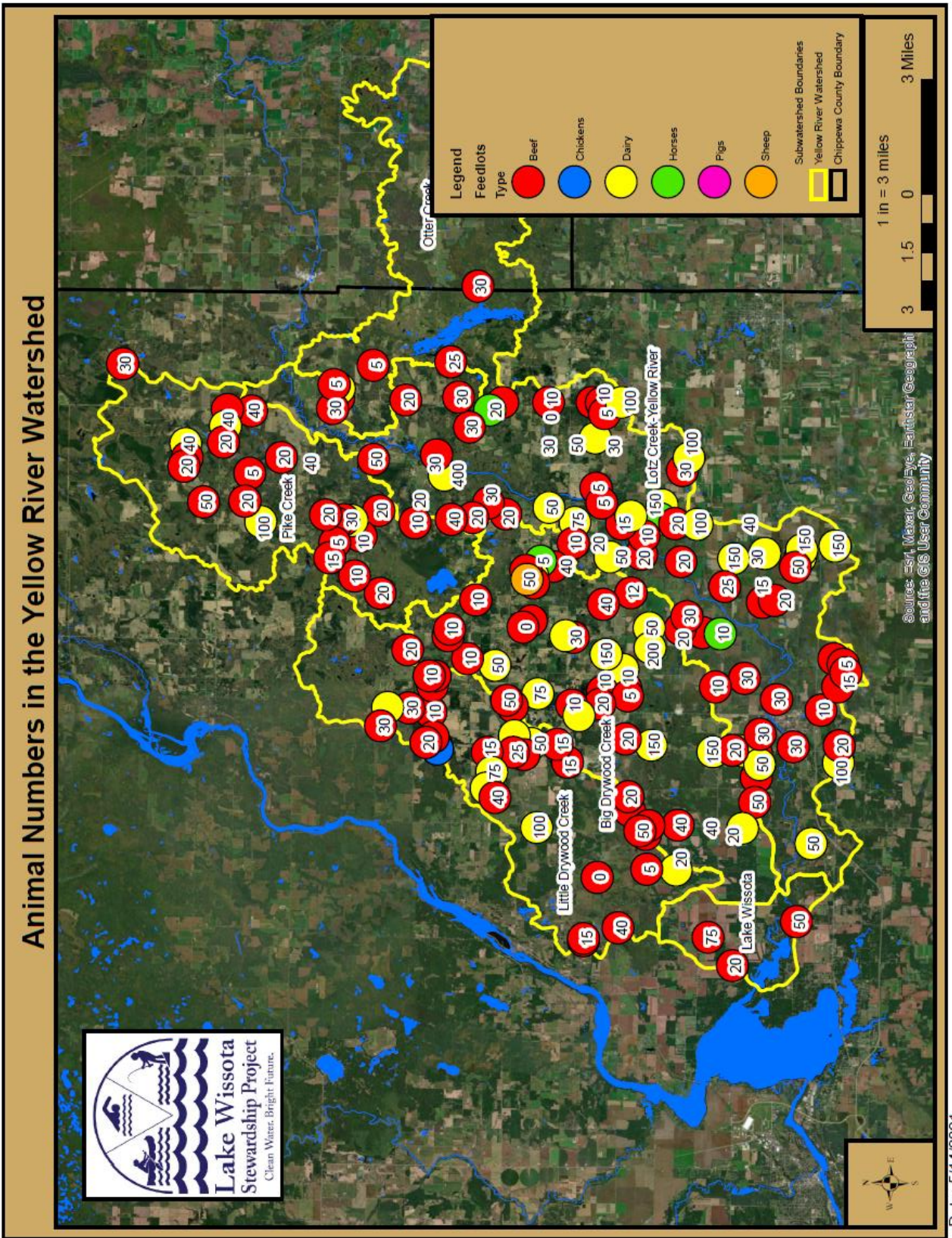
* = Feedlot runoff risk was estimated using aerial imagery from multiple years, with some limited field verification

Table 4: Individual Animal Counts* by Sub watershed

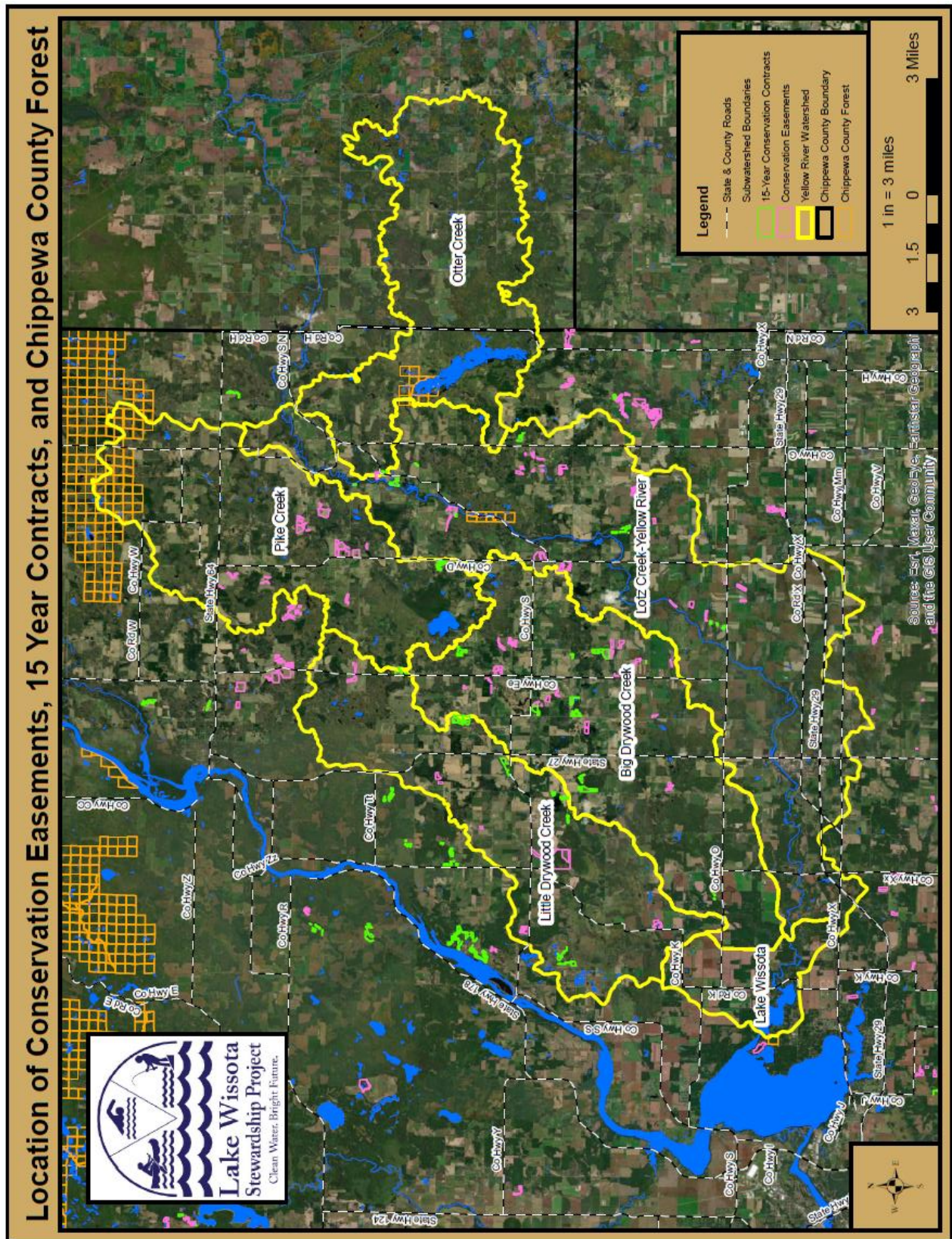
Watershed	<u>Dairy Cows</u>	<u>Beef Cows</u>	<u>Horses</u>	<u>Sheep</u>	<u>Chickens</u>	<u>Pigs</u>
Lake Wissota	<u>0</u>	<u>145</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Little Drywood	<u>800</u>	<u>2702</u>	<u>0</u>	<u>0</u>	<u>500</u>	<u>0</u>
Big Drywood	<u>1895</u>	<u>497</u>	<u>5</u>	<u>50</u>	<u>0</u>	<u>0</u>
Lotz Creek/Yellow River	<u>3180</u>	<u>1055</u>	<u>40</u>	<u>0</u>	<u>0</u>	<u>0</u>
Pike Creek	<u>260</u>	<u>390</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Otter Creek	<u>50</u>	<u>115</u>	<u>20</u>	<u>0</u>	<u>0</u>	<u>0</u>

* = Animal counts estimated by Chippewa County Land Conservation Dept staff.

Map 5 shows Animal Numbers and Approximate Locations in the Lower Yellow River Watershed symbolized by animal type



Map 6 shows conservation easements, 15-year conservation contracts, and public lands in the Yellow River Watershed.



1.12 The Future Watershed Pollution Causes and Sources to Consider

Changes in land cover and land use will directly influence associated pollutant loading to Moon Bay. Based on agriculture projections and statistics in the last ten years, there is an ongoing trend in small dairy operations, that use perennial pastures, transitioning to larger dairy and cash grain operations (that primarily use annual based crops and tillage). If cash grain expansion continues, it is also anticipated that swine and poultry operations may increase in coming years. Agricultural trends such as these will increase cropland soil erosion, nutrient applications, and corresponding phosphorus loss to surface waters, via runoff, in the watershed. These factors, in turn, will place a further strain on area water resources and create increased non-point source impacts to the Yellow River and Lake Wissota.

With regard to land tenure and operations., land inventories have shown that half of agricultural land is operated by its owner, and half of agricultural land is leased to large scale cash crop operations. Land is leased by producers using short term 1–3-year contracts.

The LWSP will monitor Land Use/Land Cover changes every three years after plan approval and adapt this watershed-based plan to reflect significant changes in land use, crop rotations, tillage frequency and corresponding soil erosion, nutrient applications, and phosphorus loss to surface waters.

Figure 2 shows a blue-green algae bloom on Lake Wissota, near Lake Wissota State Park (Photographed 8/13/2018, D. Barrickman). Nonpoint agricultural sources from the upstream watershed area caused, or contributed to, this bloom. Moon Bay has similar algae blooms.



Element 2 - The Load Reductions Expected from The Management Measures

EPA guidance requires that a 9-Key Element Plan Provides:

“An estimate of the load reductions expected from management measures”, (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Page 2-15).

2.1 The Agricultural Non-Point Source Load Reductions

The anticipated agricultural non-point source load reductions, determined using BATHTUB modeling as conducted by WDNR in 2018, were estimated in an internal WDNR memorandum written by Pat Oldenburg is (P. Oldenburg, Internal WDNR Memo, Appendix 2).

The Memo concludes “A 72% reduction from the controllable sources (of phosphorus) would be needed to meet the total load reduction of 54%. (P. Oldenburg, Internal WDNR 2018 Memo, Appendix 2)

STEPL Modeling was conducted as part of the current watershed planning process in the spring of 2020 to further evaluate pollutant loads and critical areas for practices in the Lower Yellow River Watershed. The 54% total phosphorus load reduction goal, recommended by the 2018 DNR - Oldenburg memo was applied to the STEPL model baseline pollutant results. See figure 3 below for those results. With baseline conditions confirmed, this plan applies additional agricultural practices and amounts to reduce current agricultural pollutant sources in the watershed (described in element 1) to reach this plan’s 54% phosphorus load reduction goal.

Figure 3 – STEPL model results – current conditions

Watershed	N Load (with BMP)	P Load (with BMP)	BOD (with BMP)	Sediment Load (with BMP)	E. coli Load (with BMP)
	lb/year	lb/year	lb/year	t/year	Billion MPN/year
W1	8954.4	1852.6	21611.4	27	0.0
W2	97927.3	13382.0	167649.4	1137.0	0.0
W3	191339.8	24236.7	333201.2	1736.6	0.0
W4	280746.8	39591.5	459096.4	2428.8	0.0
W5	48833.8	7874.6	98464.5	656.9	0.0
W6	21427.7	4032.1	53379.6	702.8	0.0
Total	649229.8	90969.5	1133402.5	6936.5	0.0

When compared, the DNR 2018 - Oldenburg memo pollutant loads and STEPL model result shown in figure 3 are similar to one another – and help form a basis for meeting this plan’s pollutant load reduction goals.

The plan’s pollutant load reductions, critical areas and management measures are outlined in greater detail in element 3 of this plan.

Element 3 - A Description of Management Measures to be Implemented

EPA guidance requires that a 9-Key Element Plan Provides:

“A description of the Agricultural Non-Point source management measures that will need to be implemented to achieve load reductions in Element 2, and a description of the critical areas in which those measures will be needed to implement this plan.”, (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Page 2-15)

For the purpose of this plan, management measures are defined as the watershed management strategy, and BMPs to be installed to meet the plan’s 54% phosphorus reduction and water quality goals.

3.1 The Agricultural Non-Point Source Strategies to Be Implemented

3.11 Agricultural Strategies to be implemented as management measures:

The current LCFM and LWSP process that will be used to implement non-point source management measures in the Yellow River Moon Bay watershed are:

1. Compiling, inventory, and modeling pollutant loads for each HUC 12 sub-basin
2. Identify priority cropland fields, livestock operations and other critical areas for BMPs to reduce phosphorus loading and meet applicable NR 151 ag performance standards and prohibitions.
3. Systematically informing landowners in the watershed of LWSP and NR151 standards and prohibitions
4. Conducting full farm NR151 Walkovers and developing NR151 farm compliance reports for priority farms/fields and other critical areas across the watershed
5. Identifying conservation practices to meet NR151 standards
6. Providing cost share and technical assistance, as necessary
7. Documenting NR 151 compliance and tracking practice implementation and nutrient load reductions, by HUC 12 sub-basin, over the plan’s 20-year schedule.

3.12 Sub-Watershed Prioritization Strategies

The six HUC 12 sub-watersheds of the Lower Yellow River watershed, as outlined in STEPL modeling, will be prioritized for plan implementation using the following criteria and table 5:

1. Watersheds with more ag acres will receive higher rank
2. Watersheds with ag acres that have higher risk for soil erosion – from EVAAL, STEPL or other analysis with receive higher rank
3. Watersheds with less adoption of NR 151 performance standards with receive higher rank
4. Watershed(s) with producers who have demonstrated more interest in soil conservation will receive higher rank
5. Watersheds with landowners already participating in the Cadott AEA will receive higher rank

*Watershed prioritization in these HUC 12's will happen under the understanding that practices will first be installed with landowners and producers that are ready, willing, and able to do so.

Table 5 – Priority Ranking of Yellow River Moon Bay HUC 12 watersheds									
Watershed*	Total Area (Sq Miles)	Cropland Acres	STEPL P-Ratio (Lbs./Acre)	EVAAL Risk?	NR151 Stds Compliance *	Farmer Led or interest?	Identified in L+W Plan?	In AEA?	
		Rank 1 = high 6 = low	Rank 1 = high 6 = low	Rank 1 = high 6 = low	Rank 1 = high 6 = low	Rank 1 = Yes 2 = no	Rank 1 = Yes 2 = no	Rank 1 = Yes 2 = no	Total Pts / Avg
A-Lake Wissota	7.3	1788.7	.49			No	Yes	No	
Rank		6	5	6	6	2	1	2	28/4
B - Little Drywood Creek	32.9	6112.9	.82			No	Yes	Yes	
Rank		3	3	2	2	2	1	1	14/2
C - Big Drywood Creek	41.6	9458.2	1.07			No	Yes	Yes	
Rank		2	2	3	3	2	1	1	14/2
D - Lotz Creek	65.0	13267.1	1.12			No	Yes	Yes	
Rank		1	1	1	1	2	1	1	8/1
E - Pike Creek	34.2	3300.1	.58			No	Yes	No	
Rank		4	4	5	5	2	1	2	23/3.2
F- Otter Creek	32.2	2828.9	.26			No	Yes	No	
Rank		5	6	4	4	2	1	2	24 / 3.4

Plan implementation will then focus upon remaining landowners second.

Using criteria 1-7 above, the following HUC 12's will be this plan's priority order for plan implementation: Lotz Creek (D), Big Drywood Creek (B), Little Drywood Creek (C); Pike Creek (E); Otter Creek (F); Lake Wissota (A),.

* = NR 151 Compliance was determined by Chippewa County Land Conservation staff and NR 151 compliance records.

3.13 Strategy for prioritizing farms

The agricultural performance standards and prohibitions, established in NR 151, have been adopted to control agricultural nonpoint source pollution sources (e.g., cropland and animal feeding operations). Public funds available from state and federal sources are limited and require a phased/prioritization approach to implementing soil and water conservation practices within watersheds.

To cost effectively pursue this plan's phosphorus and water quality goals., Chippewa county will pursue a comprehensive full farm, all standards approach when completing NR 151 farm evaluations within each HUC 12 sub-watershed. In administering this approach, the county will assign cost-share funding priority to those farms agreeing to pursue full NR 151 compliance within the prioritized HUC 12 watersheds described above in table 5.

In circumstances where public cost-share funds are limited, the NR 151 agricultural standards and prohibitions have been prioritized so that they may be implemented through a phased approach. These priorities have been established based upon the source of nonpoint pollution identified in this plan and the environmental cost effectiveness of implementing each performance standard.

The priority for implementing the standards, when conducted through other than a fully funded whole farm, all standards approach, is outlined above in table 5. It is the intent of the county that the local system of priorities be considered by state and federal agencies as local strategies are developed and decisions are made regarding public cost-share allocations.

3.2 Agricultural management measures and practices to be implemented:

The management measures that are currently implemented and planned to be implemented to meet this plan’s phosphorus reduction and water quality goals over the plan’s twenty-year schedule are:

- 1) Agricultural non-point source pollution control practices as defined in Wisconsin Administrative Code ATCP 50
- 2) Documenting compliance or verifying ongoing conformance with the existing agricultural cropland and livestock performance standards and prohibitions for pollution control as defined in Wisconsin Administrative Code NR151

Table 6 - ATCP 50 Practices	
ATCP 50.61 General standards for cost-shared practices; pre-approval of cost-shared practices.	ATCP 50.81 Relocating or abandoning animal feeding operations.
ATCP 50.62 Manure storage systems. **	ATCP 50.82 Residue management. *
ATCP 50.63 Manure storage system closure. **	ATCP 50.83 Riparian buffers. ^
ATCP 50.64 Barnyard runoff control systems. **	ATCP 50.84 Roofs. **
ATCP 50.65 Access road.	ATCP 50.85 Roof runoff systems. **
ATCP 50.66 Trails and walkways**. *	ATCP 50.86 Sediment basins.
ATCP 50.67 Contour farming. *	ATCP 50.87 Sinkhole treatment.
ATCP 50.68 Cover crop*	ATCP 50.88 Streambank or shoreline protection. ^
ATCP 50.69 Critical area stabilization**. *	ATCP 50.885 Stream Crossing. ^
ATCP 50.70 Diversions.	ATCP 50.89 Strip-cropping.
ATCP 50.705 Feed storage runoff control systems. **	ATCP 50.90 Subsurface drains.
ATCP 50.71 Field windbreaks.	ATCP 50.91 Terrace systems.
ATCP 50.72 Filter strips. *	ATCP 50.92 Underground outlets.
ATCP 50.73 Grade stabilization structures.	ATCP 50.93 Waste transfer systems. **
ATCP 50.75 Livestock fencing. ^	ATCP 50.94 Wastewater treatment strips.
ATCP 50.76 Livestock watering facilities. ^	ATCP 50.95 Water and sediment control basins. *
ATCP 50.77 Milking center waste control systems. **	ATCP 50.96 Waterway systems*.
ATCP 50.78 Nutrient management. *	ATCP 50.97 Well decommissioning.
ATCP 50.79 Pesticide management.	ATCP 50.98 Wetland development or restoration^
ATCP 50.80 Prescribed grazing*.	

* = Cropland priority practices

** = Feedlot priority practices

^ = Streambank and Edge of field priority practices

3.21 NR151 and NRCS 590 Nutrient Management Plan Tracking

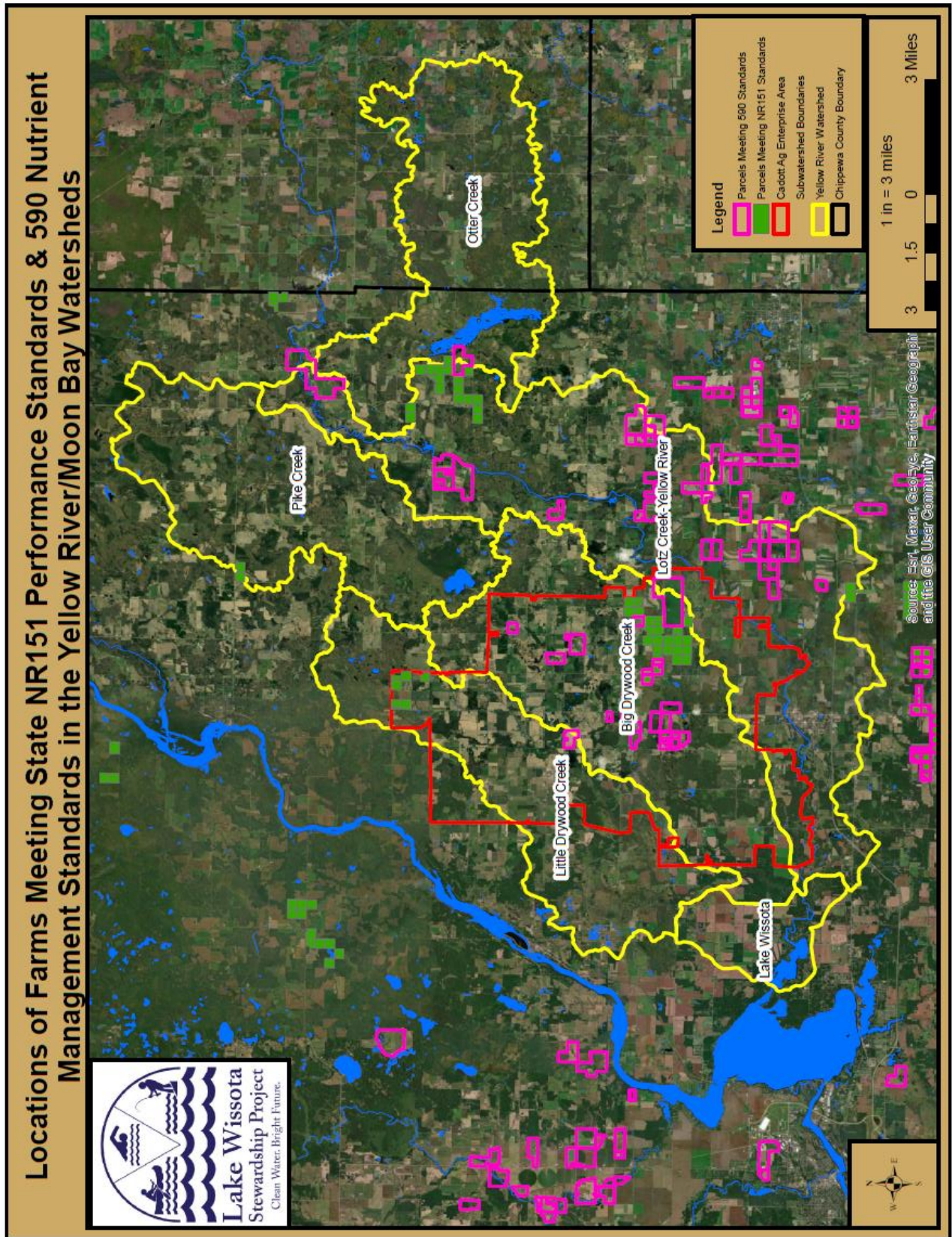
The Chippewa County Department of Land Conservation and Forest Management has been active in tracking the existing agricultural non-point source management measures that are currently in place within and outside of the Yellow River Moon Bay watershed.

The department keeps records of all farms and land that meet all agricultural performance standards and prohibitions in NR151. A map of all parcels that meet NR151 requirements is shown below.

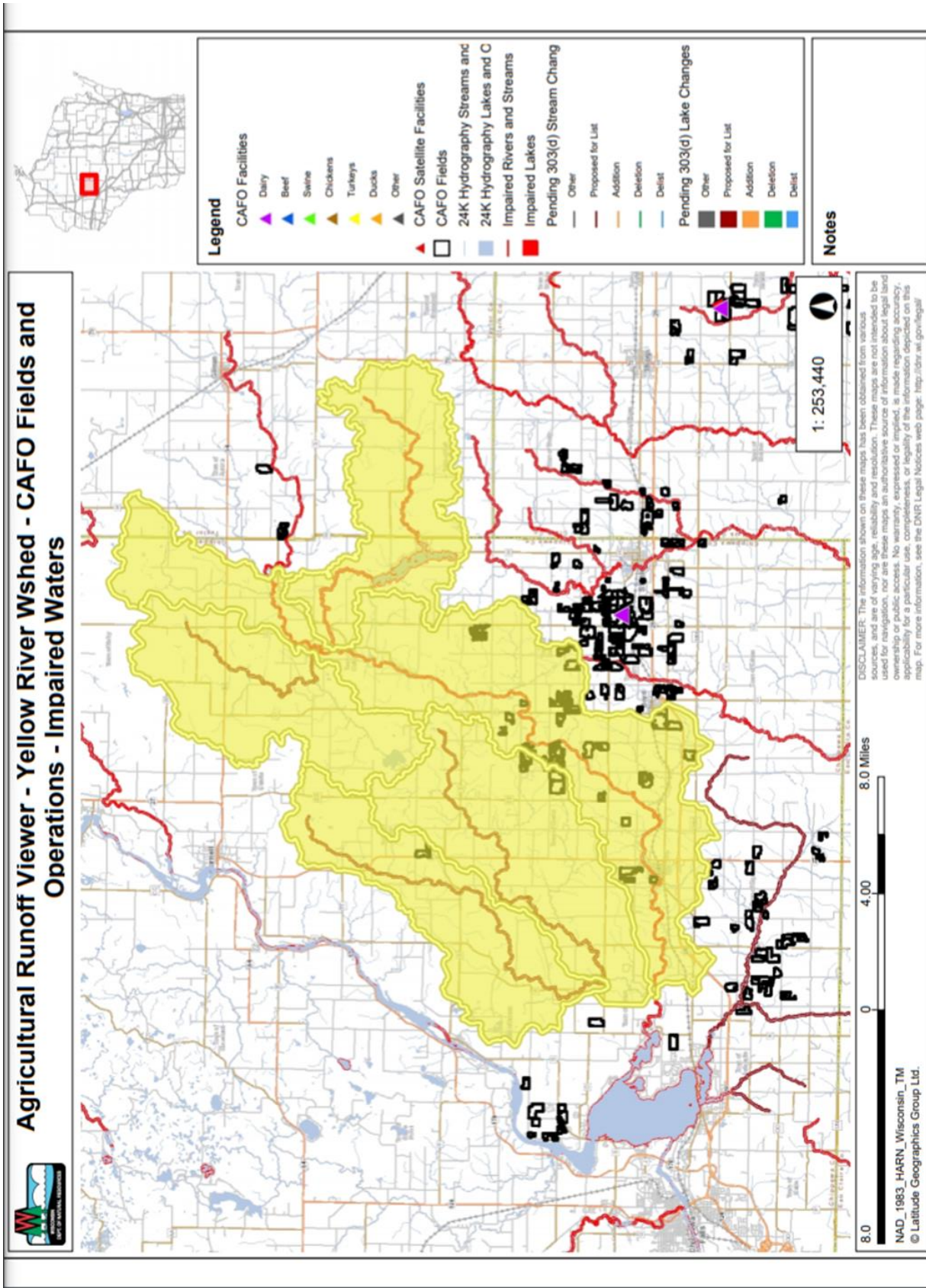
The map shows parcels that were in compliance of all NR151 standards and prohibitions at the time of inspection.

This plan recognizes that farms and land can fall out of compliance with NR151 performance standards over time and may require additional verification of NR151 compliance over time. Maintaining or tracking compliance with NR 151 may include consulting with DNR nonpoint source staff.

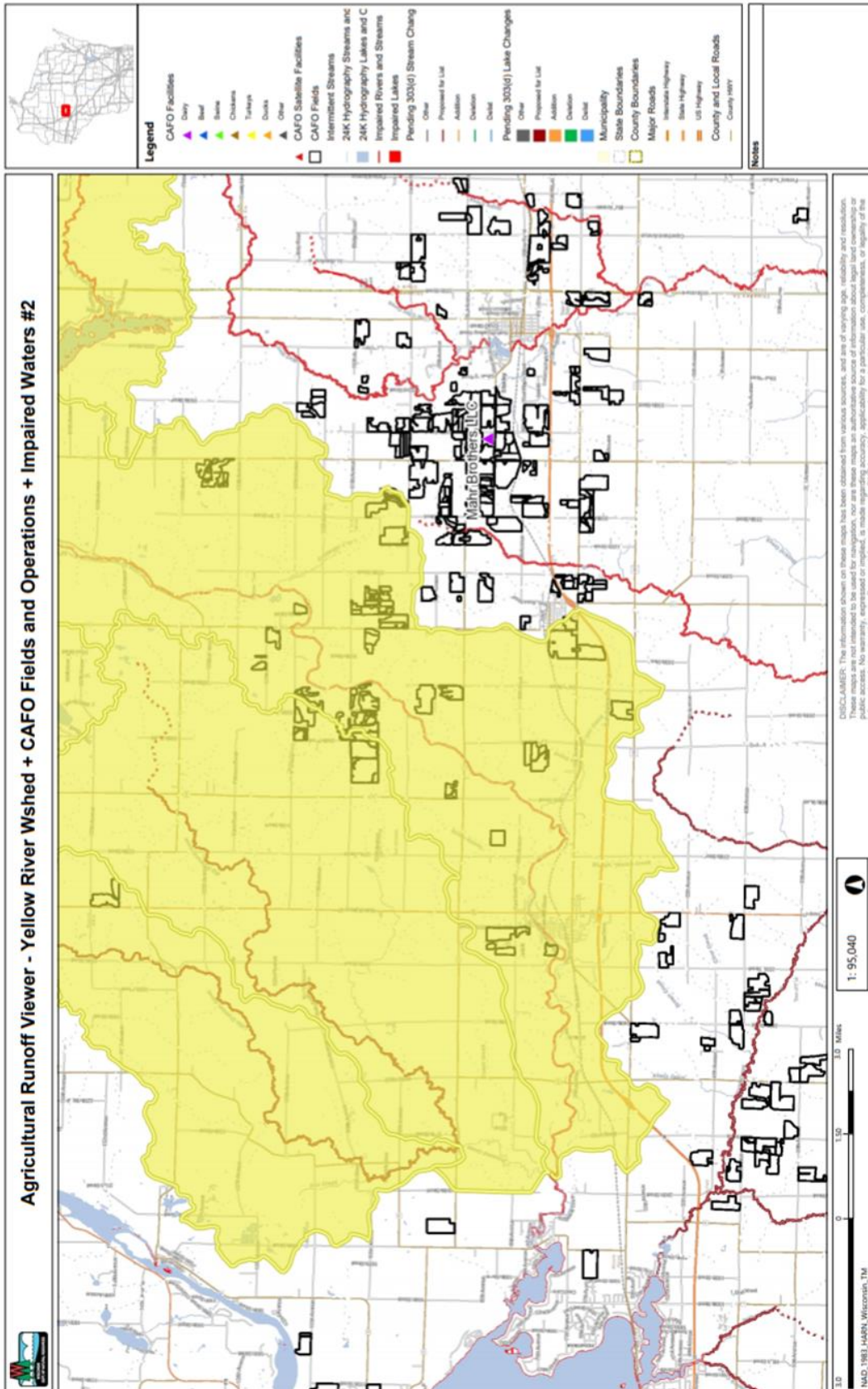
Map 6A Shows the locations of Parcels Meeting 590 NMP and NR151 Standards



Map 6B Shows the locations of CAFO operated fields in the Yellow River Watershed



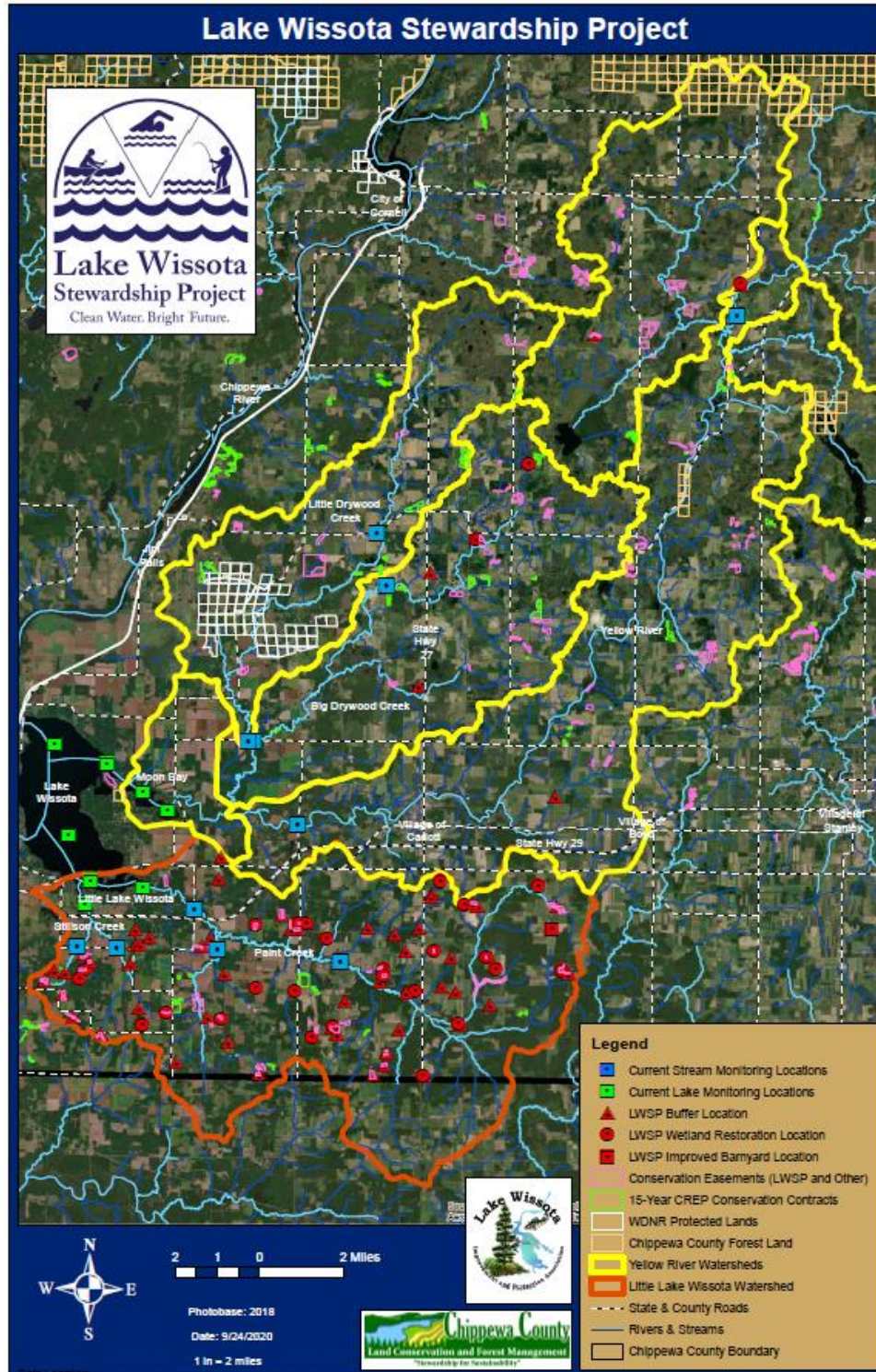
Map 6C Shows the locations of CAFO operated fields in the Yellow River Watershed



3.22 Lake Wissota Stewardship Project Conservation Practice Installations and Locations

The Lake Wissota Stewardship Project has tracked all conservation projects installed in the Yellow River Moon Bay Watershed. This includes wetland restorations, stream buffers, groundwater scrapes, and barnyard improvement projects.

Map 8 shows the locations of stream buffers, wetland restorations, and sediment detention basins installed in the Lake Wissota Stewardship Project Area as of Spring 2021.



3.23 Lake Wissota Stewardship Project Stream/Wetland/Riparian Buffers

The Lake Wissota Stewardship Project has installed 31 Stream and Wetland Buffers in the Lake Wissota Stewardship Project Watersheds from 2009-2020.

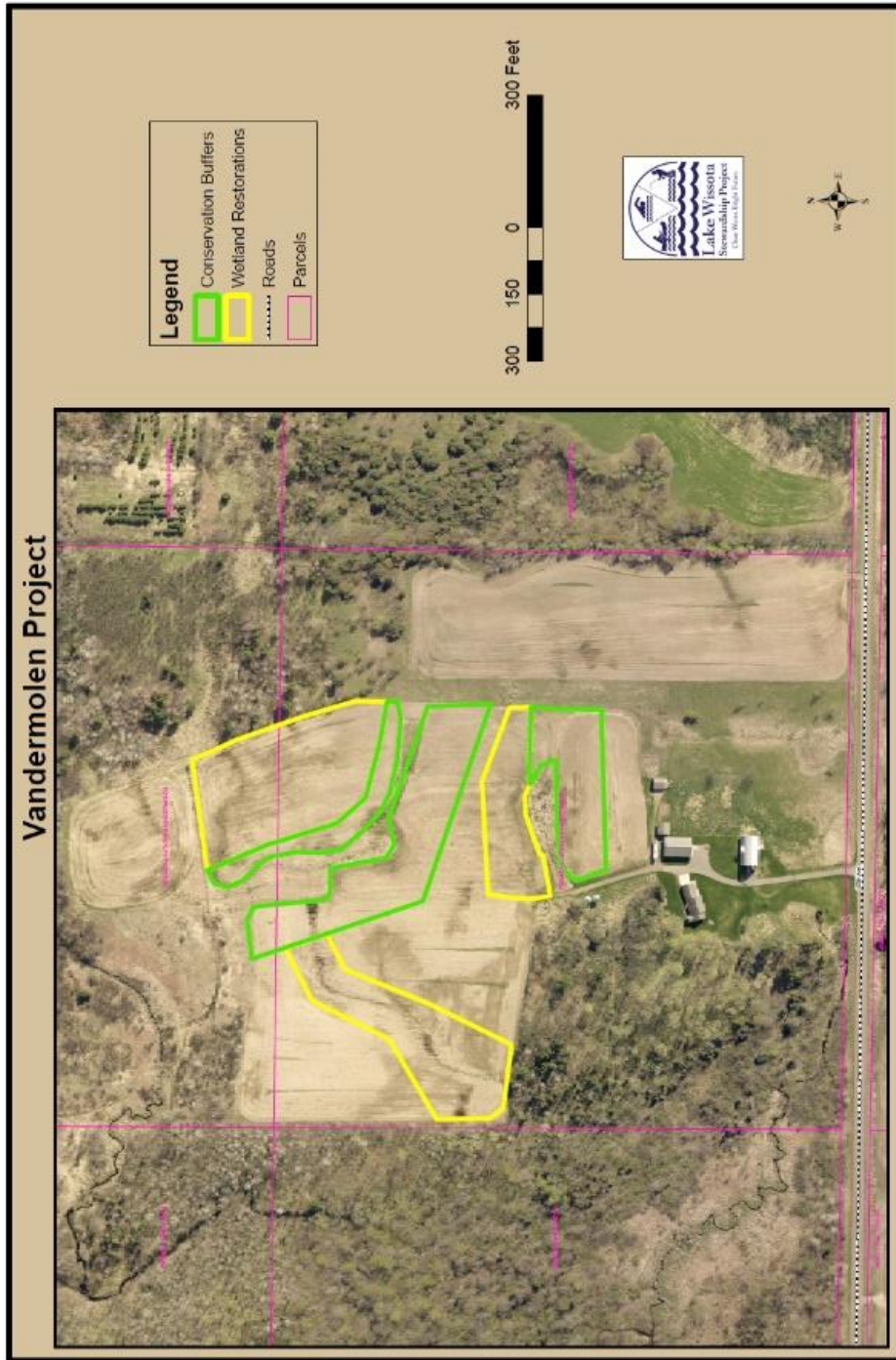
Figure 4 is a photo of a riparian buffer installed in the Yellow River Watershed



3.24 Lake Wissota Stewardship Project Wetland Restorations

The Lake Wissota Stewardship Project has installed many large wetland restorations in the Little Lake Wissota and Yellow River Watersheds from 2009-2020.

Figure 5 shows the before and after aerial photos of the Vandermolen wetland restoration installed in the Yellow River Watershed



3.25 Lake Wissota Stewardship Project Sediment Detention Basins

The Lake Wissota Stewardship Project has installed 38 sediment detention basins in the Lake Wissota Watershed from 2009-2017.

Figure 6 shows a newly installed and seeded sediment detention basin in the Yellow River Watershed

Figure 6



3.26 Lake Wissota Stewardship Project Barnyard Improvement Projects

The Chippewa County Department of Land Conservation and Forest Management assists farmers in barnyard improvement projects funded through state and federal cost share opportunities.

Currently (Winter 2020-2021), the LCFM and LWSP is assisting a landowner in the Yellow River watershed on a barnyard improvement project. The project consists of manure storage abandonment, wetland feedlot abandonment and conservation cover, new livestock siting and barn development, and new animal waste storage. Such projects can result in significant reductions of phosphorus and other nutrient loading to surface waters.

3.27 Lake Wissota Stewardship Project Cover Cropping

Figure 7 – Cover Crop Seeding



2020 was the first cover crop seeding project that cost shared by the LCFM and LWSP in the Yellow River Watershed (Big Drywood Sub watershed). The 200 acres of cover crop was broadcast spread rye into soybeans, and they changed colors and got ready to drop their leaves. The seeding on Oct 20th, 2020 was later than anticipated, but the rye greened up before the ground froze, and will green up in the spring of 2021.

This type of cover crop practice will provide spring vegetative cover of cropland before termination and will, over time, reduce phosphorus loss and improve soil health (plant species diversity, nutrient cycling, CO₂ from atmosphere into soil, etc.). It can also provide viable product that can be used as early harvest livestock feed.

In 2021, the landowner who adopted this cover crop practice plans to utilize more acres of rye cover as dairy forage, harvested in mid-May – then rotated to short season corn. He also will use some of the rye cover acres to terminate and no-till corn into (more of a conservation feature, without taking a forage crop). Implementing cover crops and reduced or no-till tillage practices on > 50% of cropland acres in a watershed that is annually tilled has been shown, via modeling within in multiple approved Wisconsin nine key element watershed-based plans, to significantly reduce soil and phosphorus loss to surface waters (DNR NPS staff communication – March 2021).

3.28 Lake Wissota Stewardship Project Nutrient Management Planning

The LCFM and LWSP has signed its first NMP contracts in the winter of 2020-2021. The Nutrient Management Plan (NMP) cost share contracts cover about 700 acres in the Yellow River Moon Bay watershed and will be implemented in the spring of 2021. NM plans help manage the amount, timing, placement, and rate of nutrient applications to meet, and not exceed, crop nutrient needs. NMP's have requirements for all fields that receive nutrients must meet rotational based soil and phosphorus loss levels. When implemented consistently, NM plans help manage agricultural lands to better protect water quality and improve farm profitability.

3.29 Lake Wissota Stewardship Project Conservation Leases

The LCFM and LWSP is currently working on a standard boilerplate conservation lease to supply to landowners who lease their land to producers in the Yellow River Moon Bay watershed. This lease will supply the landowner with language to communicate how they want their land farmed, including some soil and water conservation practices they to be implemented by the producer that are consistent with this plan's implementation milestones.

3.221 Lake Wissota Stewardship Project Contour Farming

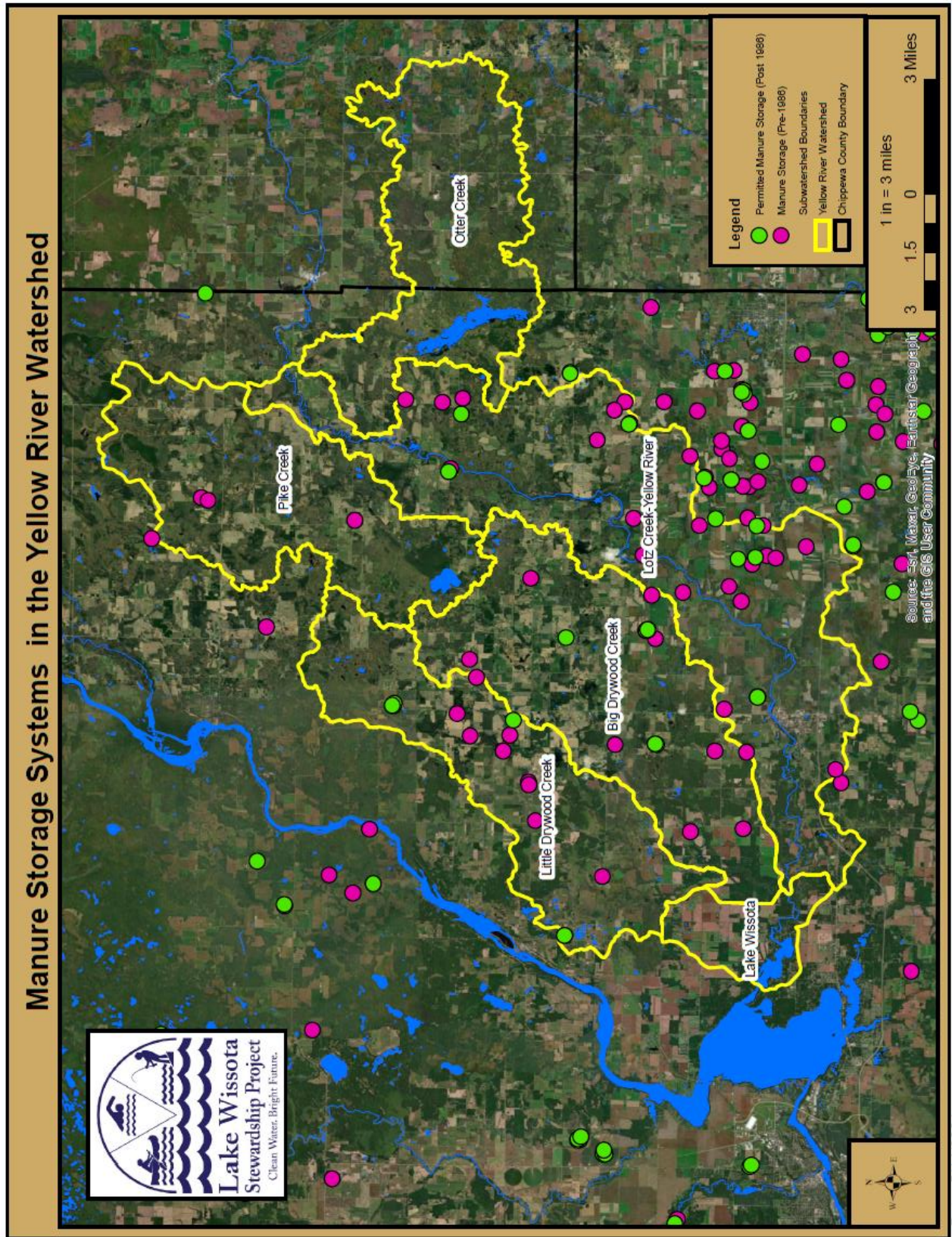
There is great potential for Contour Farming in the Yellow River Watershed. Small dairy farms in the watershed have historically implemented contour farming. As small dairy farms have decreased, large cash crop operators have turned rotationally farmed fields into singular fields and removed contour strips. The LCFM and LWSP will work with landowners and producers to install conservation contour strips back into the Yellow River Watershed landscape. EVAAL and other critical areas analysis in this plan will help prioritize cropland acres for contour strip practices. The priority HUC 12 watersheds in this plan for contour farming include the central parts of the Lotz Creek watershed, the central parts of the Little Drywood watershed, and the east part of the Big Drywood watershed. When implemented and maintained, SnapPlus software confirms contour strips significantly reduce both soil and phosphorus losses from annually cropped and tilled fields.

3.222 Chippewa County Livestock Facility and Ag Performance Standard Ordinance

As an outcome of the Chippewa County Land and Water Resource Management Planning process, the LCFM was directed to prepare an agricultural performance standard based livestock and livestock facility ordinance that would apply to all livestock and cropping operations in the county in 2021. The draft ordinance has been prepared and has gone through agency and legal review. The ordinance was adopted in the summer of 2021 and is now being implemented by the Chippewa County LCFM. Compliance inspections are triggered by either proposed expansion of manure storage or any public complaint that cropland or livestock standards are not being met

The ordinance will provide LCFM additional authority to address agricultural livestock expansions and complaints received in the Yellow River watershed via NR 151 agricultural performance standards and prohibitions. The ordinance will be implemented using the existing procedure as established in the 2004 MOU for NR151 implementation between the Chippewa County LCFM and WDNR. (Appendix 4 and 5)

Map 9 shows the locations of animal waste ordinance permitted projects in Chippewa County, 1986 to present.



3.223 Chippewa County Farmland Preservation Program/Agricultural Enterprise Area

The Wisconsin Farmland Preservation Program (FLP) provides state income tax credits to farmers who meet program requirements. Program requirements include meeting soil and water conservation standards within NR 151, and using the land for agriculture only.

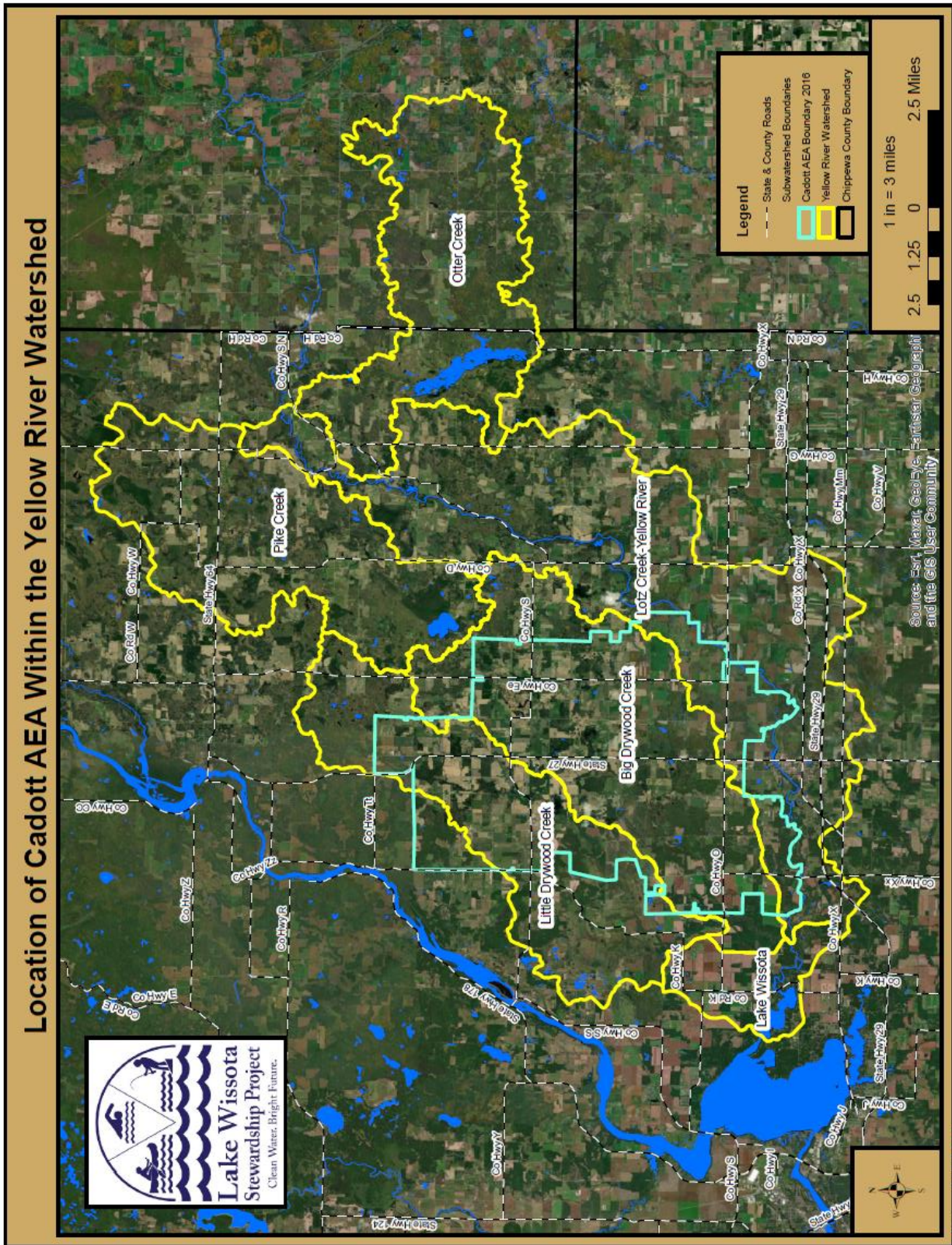
No new Farmland Preservation contracts are being developed. If a landowner had an active contract in place before the law changed, the state continues to honor the contract.

Currently, the former Farmland Preservation Program in Chippewa county has been replaced with [Agriculture Enterprise Areas \(AEAs\)](#).

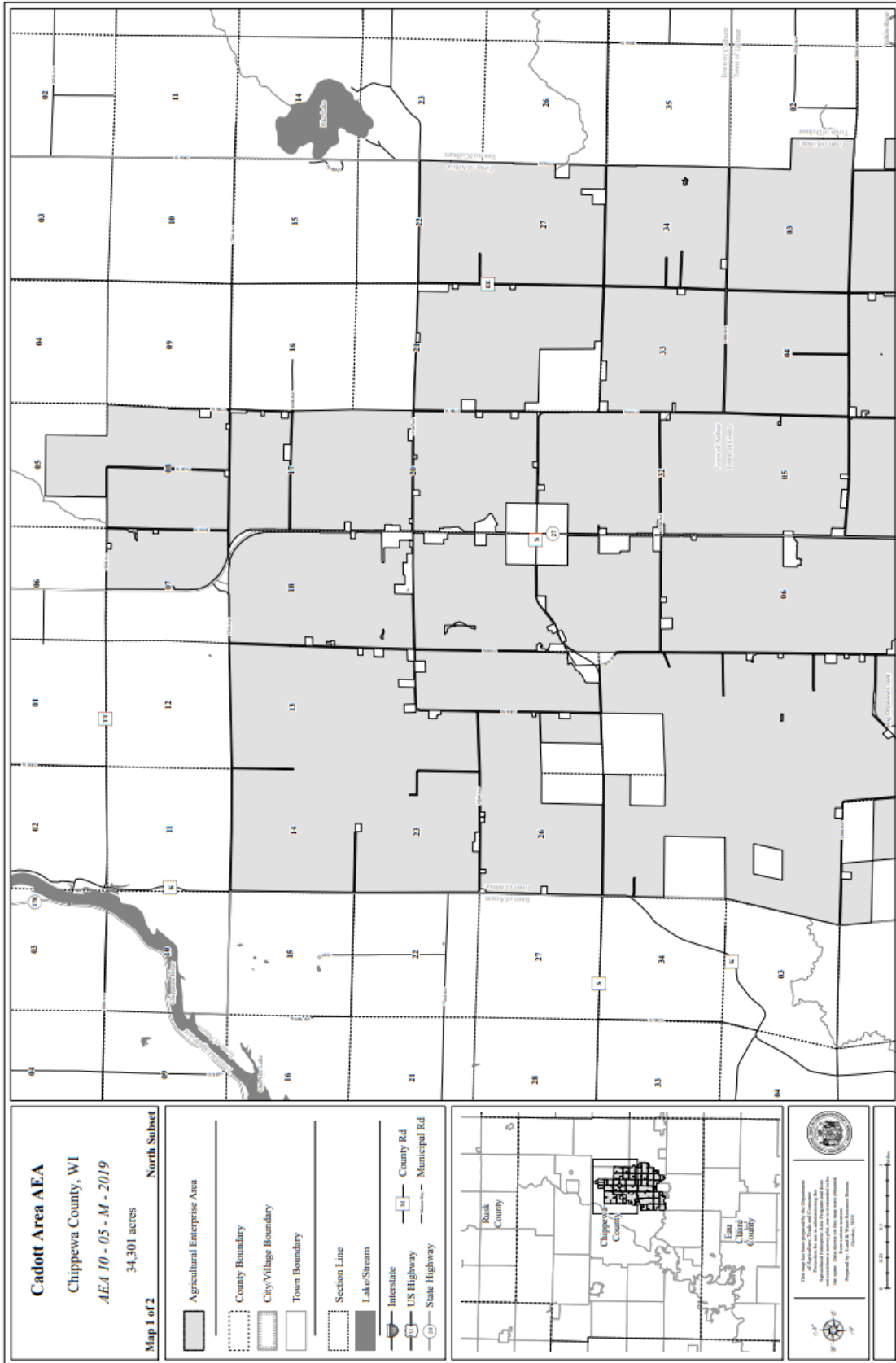
In Chippewa County, farmers with an active Farmland Preservation contract are required to annually certify that they are meeting requirements of their contract. A reminder letter is sent to individual landowners in the spring of each year.

As of Spring 2021, 3,004 acres of cropland are participating within the Cadott AEA, which consists of 34,301 total acres. Most of the Cadott AEA cropland acres are located within Big Drywood and Little Drywood Creek HUC 12's (see map 10, 11, and 12 below). Approximately 3,004 cropland acres within the Cadott AEA may be meeting the applicable NR 151 soil and water conservation standards. Annually, the Cadott AEA producers self-certify that they meet the NR 151 standards. On-site compliance checks have not been conducted since the signing of their FLP contracts however, compliance checks are for 2022.

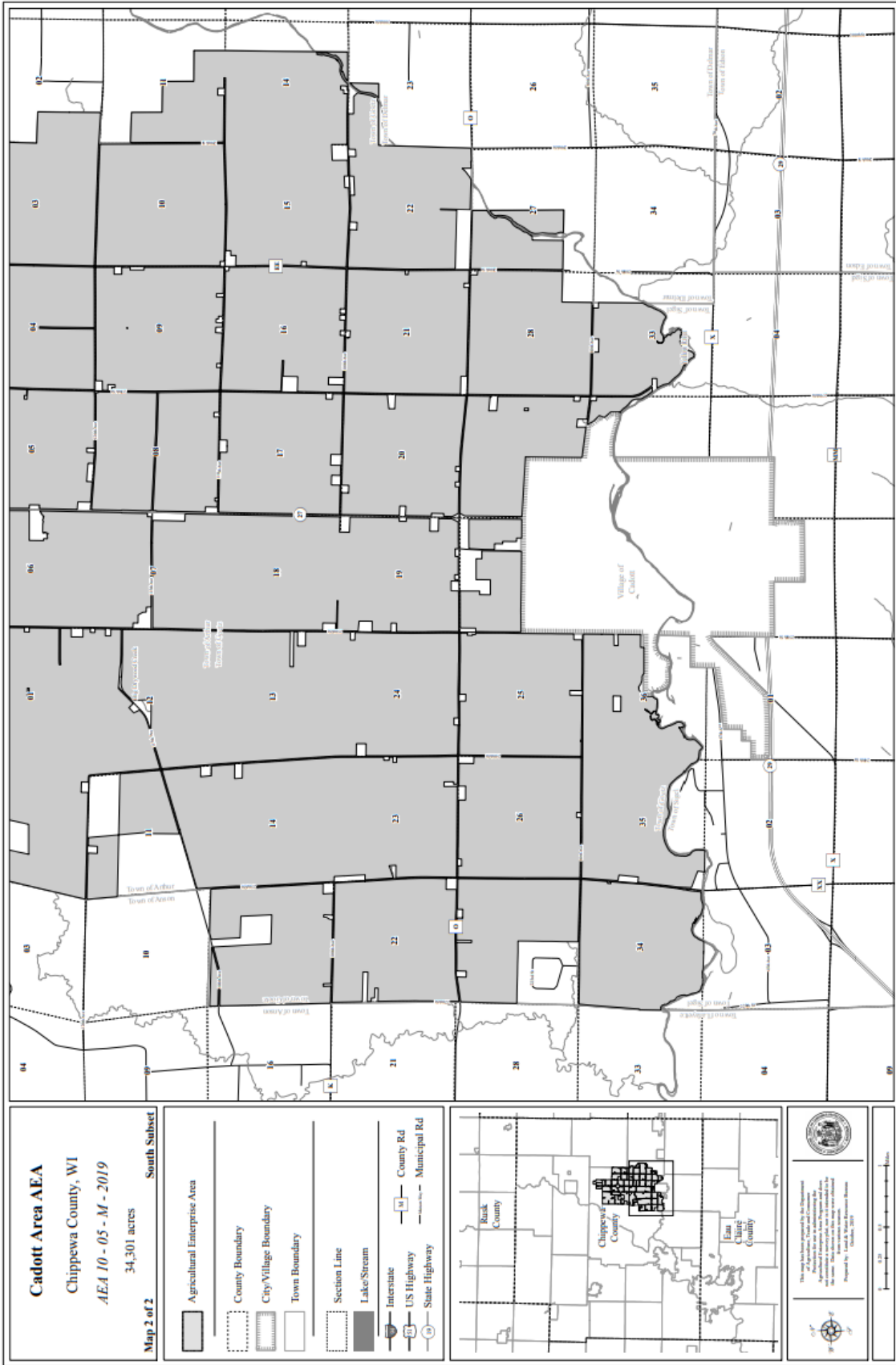
Map 10 shows the Cadott AEA within the Yellow River Watershed.



Map 11: DATCP Map Showing North End of Cadott AEA



Map 12: DATCP Map Showing South End of Cadott AEA



3.3. The Proposed Agricultural Non-Point Source Management Measures to be Implemented

In 2017, it was decided by the LCFM and LWIPA that the Little Lake Wissota Stewardship Project would be extended for another 5 years and include the Yellow River Watershed of Lake Wissota to further improve hydrologic conditions and reduce phosphorus and sediment loading in the watershed. Project areas will be prioritized using the HUC 12 ranking criteria described earlier in this plan will focus on installing stream buffers and wetland restorations in the lowlands and providing cost sharing for reduced tillage, cover crop, and increased residue farming practices to bring agricultural land into NR151 compliance in the uplands. In order to concentrate this plan's soil and water conservation goals on areas to achieve the most efficient use of funds, it was necessary to use **STEPL**, **PRESTO**, and **EVAAL** modeling tools to identify the best conservation practice locations.

STEPL calculates nutrient and sediment loads for a watershed from different land uses and the load reduction that would result from the implementation of various best management practices (BMP's). STEPL does not predict critical areas in a watershed for adoption of conservation practices.

EVAAL prioritizes areas within a watershed that may be vulnerable to sheet, rill and gully erosion. Unlike STEPL, EVAAL predicts individual locations/critical areas within a watershed where water and soil conservation practices can and should be applied.

PRESTO The Pollutant Load Ratio Estimation Tool (PRESTO) is a statewide GIS-based tool that compares the average annual phosphorus loads originating from point and nonpoint sources within a watershed. The comparison provides a screening tool for industrial and municipal dischargers to determine one of the conditions of eligibility for adaptive management as part of s. NR 217.18, Wisconsin Administrative Code.

PRESTO was designed to be easily modified, transparent to the end user, and provide a consistent result based on readily available datasets. PRESTO performs three basic functions: watershed delineation, nonpoint source loading estimation, and point source loading aggregation. The PRESTO outputs include a delineated watershed, watershed land cover composition, the estimated average annual nonpoint source and measured point source phosphorus loads (pounds per year), and the ratio of point to nonpoint phosphorus at a watershed outlet.

3.31 STEPL Modeling

Introduction

The Spreadsheet Tool for Estimating Pollutant Load (STEPL) model is an EPA accepted approach for estimating nutrient and sediment loads within a watershed using landcover and pollutant load reductions from the implementation of various BMP's. Inputs to the model include land use/land cover, USLE soil characteristics, animal units, manure management and climate.

Methods

Table 7 documents the data and sources used in the Yellow River STEPL model.

Table 7

Model Input	Source/Explanation
Watershed Land Use Area	2015 USDA National Land Cover Dataset
Input Agricultural Animals	2015 Agricultural Census of Chippewa County
Septic System Data	Parcels with > \$20,000 improvement on tax records
USLE Parameters	Area weighted average analysis for each watershed
Average Soil Hydrologic Groups	WEB Soil Survey, USDA SSURGO Database, Area Weighted Analysis
Climate Data	National Climatic Data Center (Chippewa Falls, WI Station)
Irrigation Area	WIS DNR High Capacity Well Dataset
Buffer Data	Field-by-Field aerial image analysis to determine 35'buffer occurrence rates
Tillage/Residue Data	Field-by-Field Tillage/Residue Checks conducted by LCFM staff 2012-2015
Cover Crop Data	Data acquired from USDA on cost sharing
Nutrient Management Plan Data	Chippewa County LCFM NMP Tracking Database and USDA Cost share Data
Watershed Boundary	USGS HUC 12 Data, subdivided into 8 sub watersheds

Results

Table 8 documents BMP nutrient and sediment reduction efficiencies for various management practices in the watershed on their own, and combined. It is clear to see that as best management practices are combined, their efficiency rate goes up significantly.

Table 8

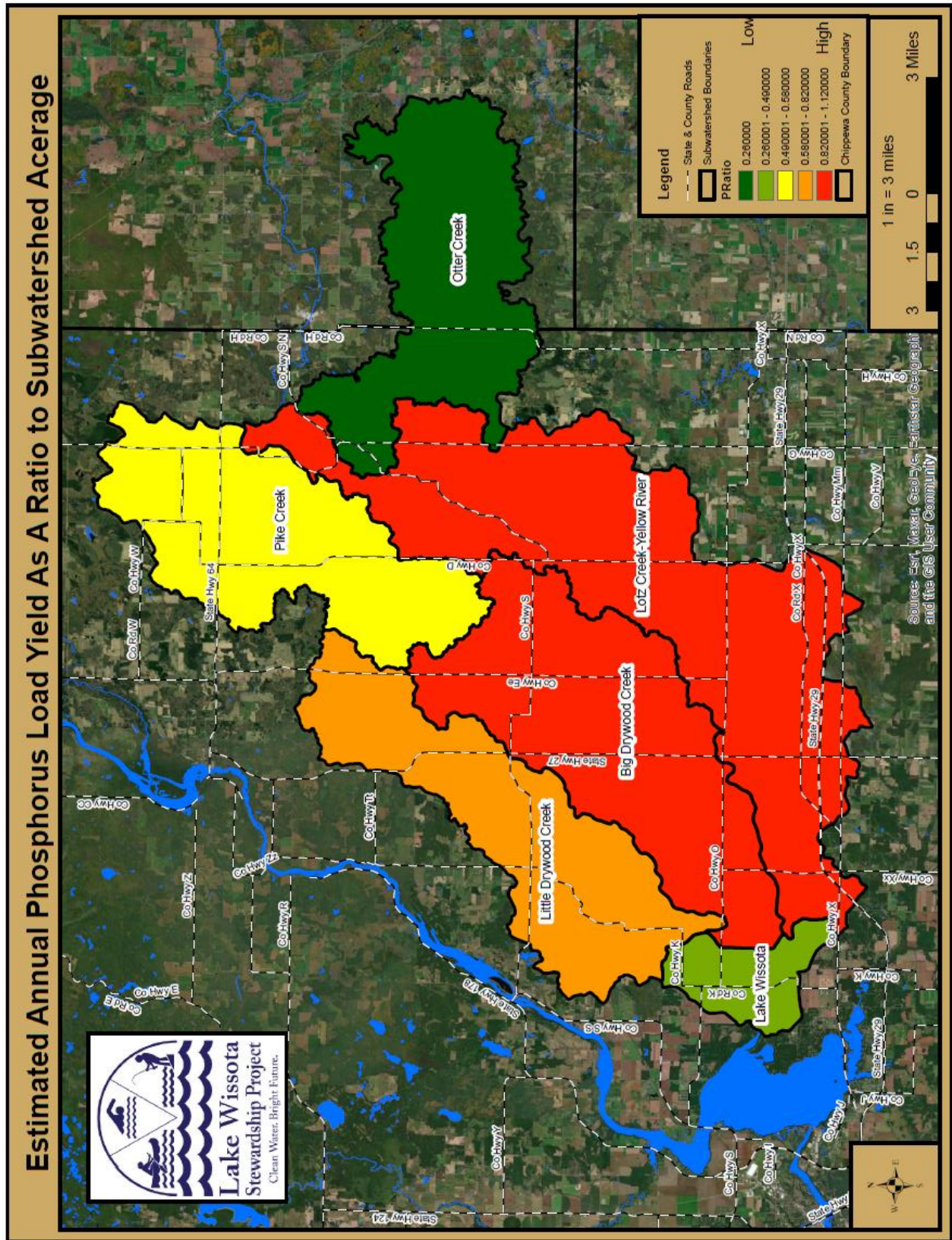
BMP & % Efficiency Table	Nitrogen	Phosphorus	BOD	Sediment	E. coli
Cash Grain Assumed Efficiencies (High Residue, 35' Grass Buffer, No NMP)	50	82	ND	89	ND
Dairy Assumed Efficiencies (Low Residue, NMP, 35' Grass Buffer)	57	84	ND	72	Nd

Scenario	Dairy - BMP & % Efficiency Table	Nitrogen	Phosphorus	BOD	Sediment	E. coli
1	High Residue + Buffer + Contour + NMP	0.73	0.95	ND	0.93	ND
2	High Residue + Buffer + Contour + NMP	0.73	0.95	ND	0.93	ND
3	High Residue + Buffer + Cover Crop + NMP	0.7	0.93	ND	0.9	ND
4	High Residue + Buffer + Contour + NMP + Cover Crop	0.78	0.96	ND	0.94	ND

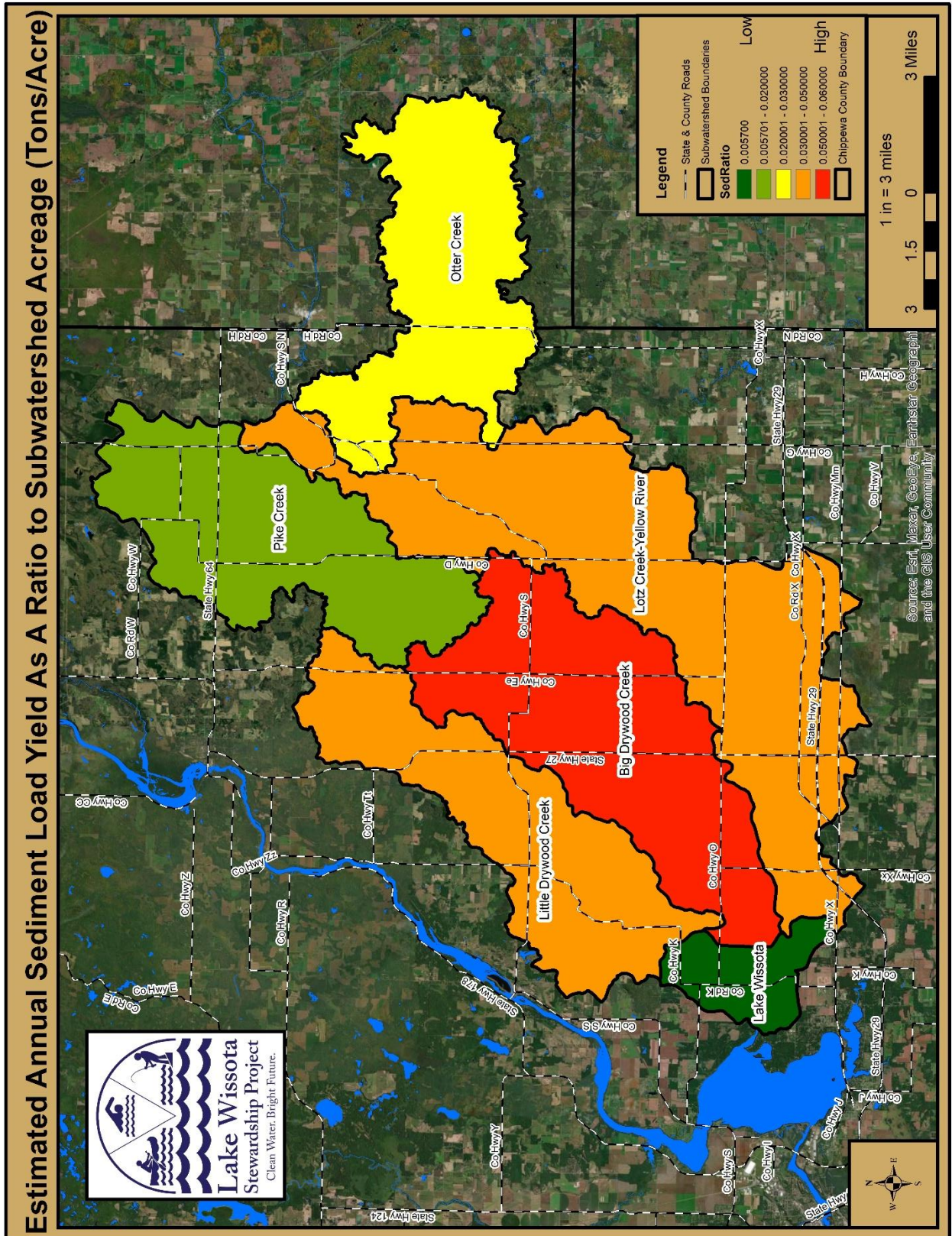
Scenario	Cash Crop - BMP & % Efficiency Table	Nitrogen	Phosphorus	BOD	Sediment	E. coli
1	High Residue + Buffer + Contour + NMP	0.73	0.95	ND	0.93	ND
2	High Residue + Buffer + Contour	0.64	0.89	ND	0.93	ND
3	High Residue + Buffer + Cover Crop + NMP	0.7	0.93	ND	0.9	ND
4	High Residue + Buffer + Contour + NMP + Cover Crop	0.78	0.96	ND	0.94	ND

The STEPL model is not a site-specific model, therefore it cannot be used to evaluate individual farms. It does, however, provide a means of comparing sub watersheds to focus conservation practices and management efforts. Results of the three modeling tools are attached. Results of the STEPL analysis are shown in the following maps and tables.

Map 13 Yellow River Sub watersheds and their estimated phosphorus loads



Map 13A Shows Yellow River Sub watersheds and their estimated Sediment loads



The following tables and graphs show the output data from the STEPL Model. These tables and figures are communicated as load by watershed and load by land use. Table 9 documents the STEPL model output results for current (2020) conditions within the Yellow River Watershed

Table 9

Watershed	N Load (with BMP)	P Load (with BMP)	BOD (with BMP)	Sediment Load (with BMP)	E. coli Load (with BMP)
	lb/year	lb/year	lb/year	t/year	Billion MPN/year
W1	8954.4	1852.6	21611.4	274.4	0.0
W2	97927.3	13382.0	167649.4	1137.0	0.0
W3	191339.8	24236.7	333201.2	1736.6	0.0
W4	280746.8	39591.5	459096.4	2428.8	0.0
W5	48833.8	7874.6	98464.5	656.9	0.0
W6	21427.7	4032.1	53379.6	702.8	0.0
Total	649229.8	90969.5	1133402.5	6936.5	0.0

Table 10 documents the STEPL model output results for the Lower Yellow River Watershed by land use.

Table 10

Sources	N Load (lb./yr.)	P Load (lb./yr.)	BOD Load (lb./yr.)	Sediment Load (t/yr.)	E. coli Load (Billion MPN/yr.)
Urban	10488.69	1614.88	40016.98	241.42	0.00
Cropland	92191.67	13281.66	323940.56	3106.99	0.00
Pastureland	75476.35	11407.26	233326.20	2992.98	0.00
Forest	8100.69	4383.62	19299.48	595.15	0.00
Feedlots	461574.69	59734.66	511111.85	0.00	0.00
User Defined	0.00	0.00	0.00	0.00	0.00
Septic	1397.73	547.44	5707.38	0.00	0.00
Gully	0.00	0.00	0.00	0.00	0.00
Streambank	0.00	0.00	0.00	0.00	0.00
Groundwater	0.00	0.00	0.00	0.00	0.00
Total	649229.81	90969.52	1133402.45	6936.53	0.00

Figure 8 documents N, P, and BOD load by watersheds with BMP (lb./yr.) in the Lower Yellow River Watershed

Figure 8

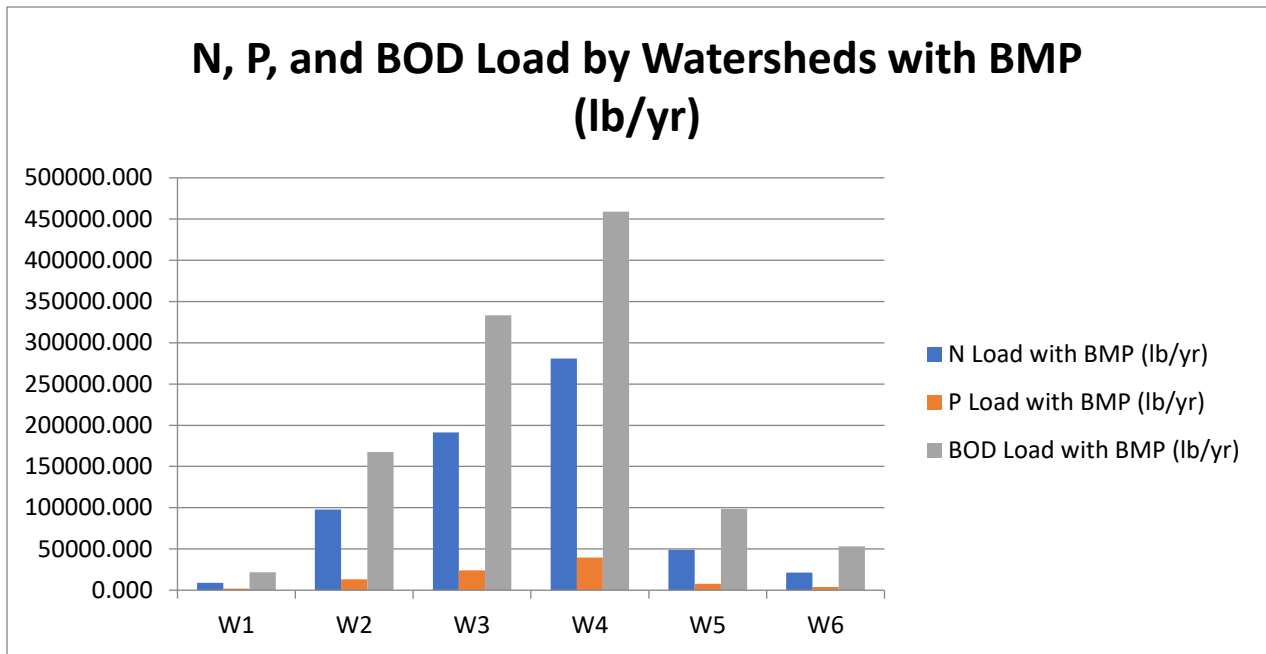


Figure 9 documents the sediment load by watershed with BMPs in the Lower Yellow River Watershed

Figure 9

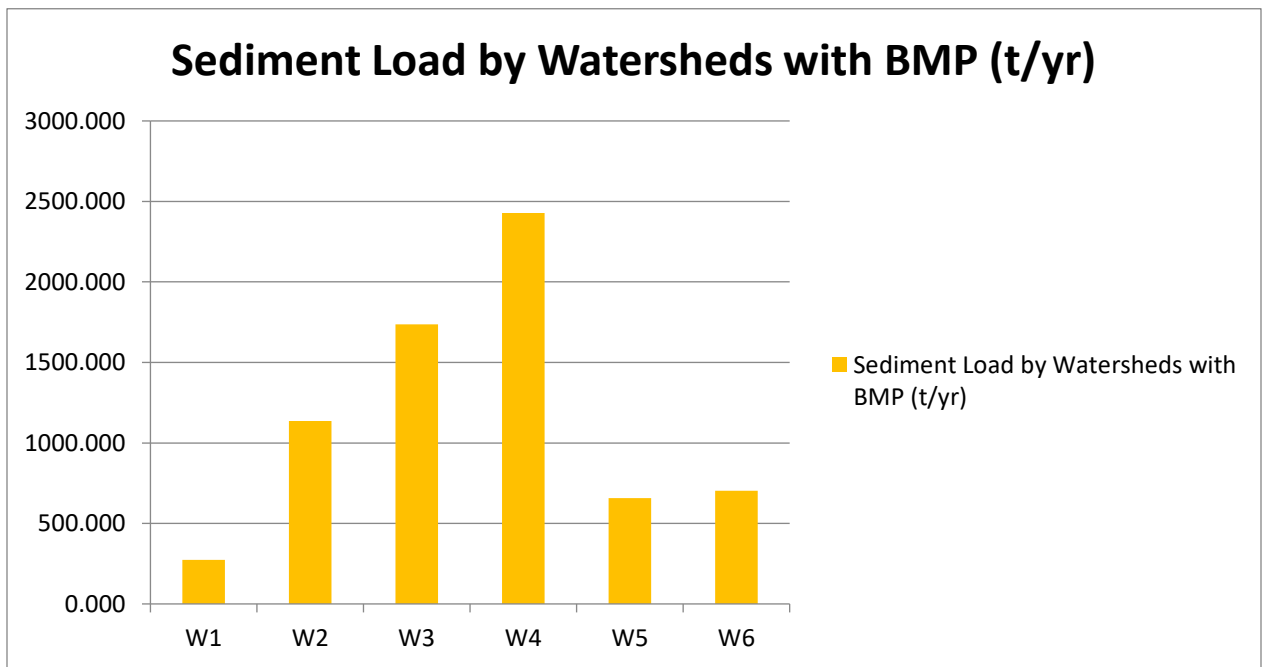


Figure 10 documents N, P, and BOD load reductions by watersheds in the Lower Yellow River Watershed

Figure 10

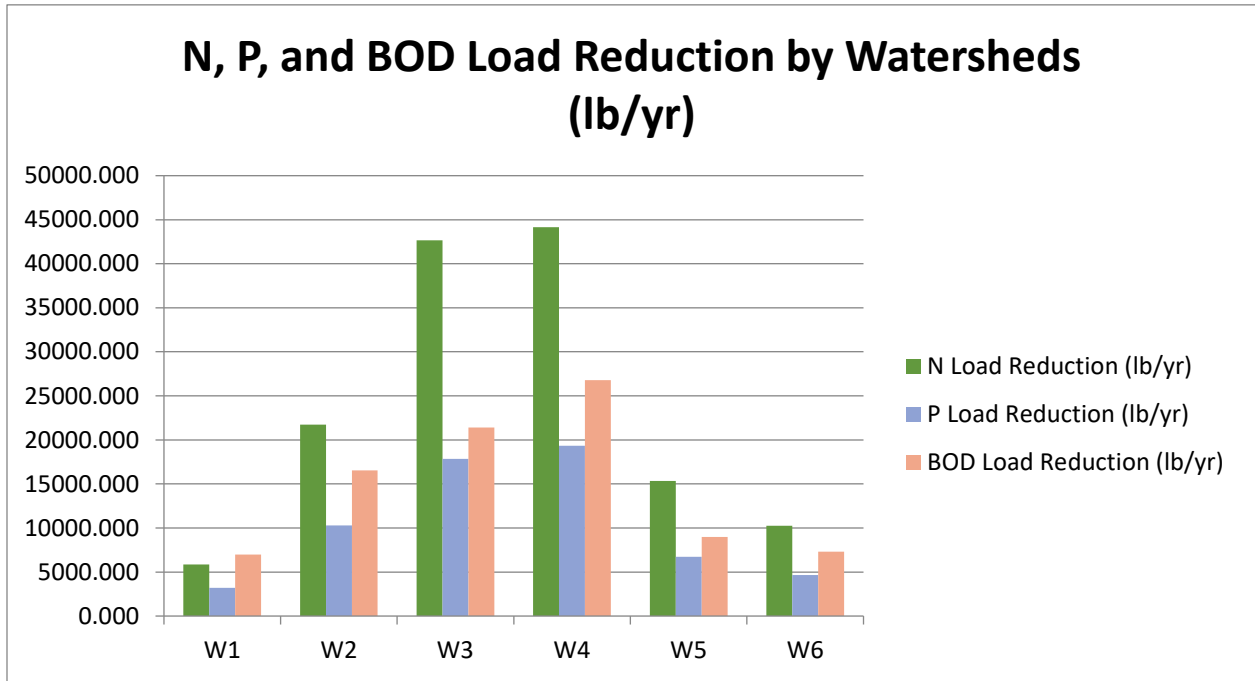


Figure 11 documents the sediment load reduction by watersheds in the Lower Yellow River Watershed

Figure 11

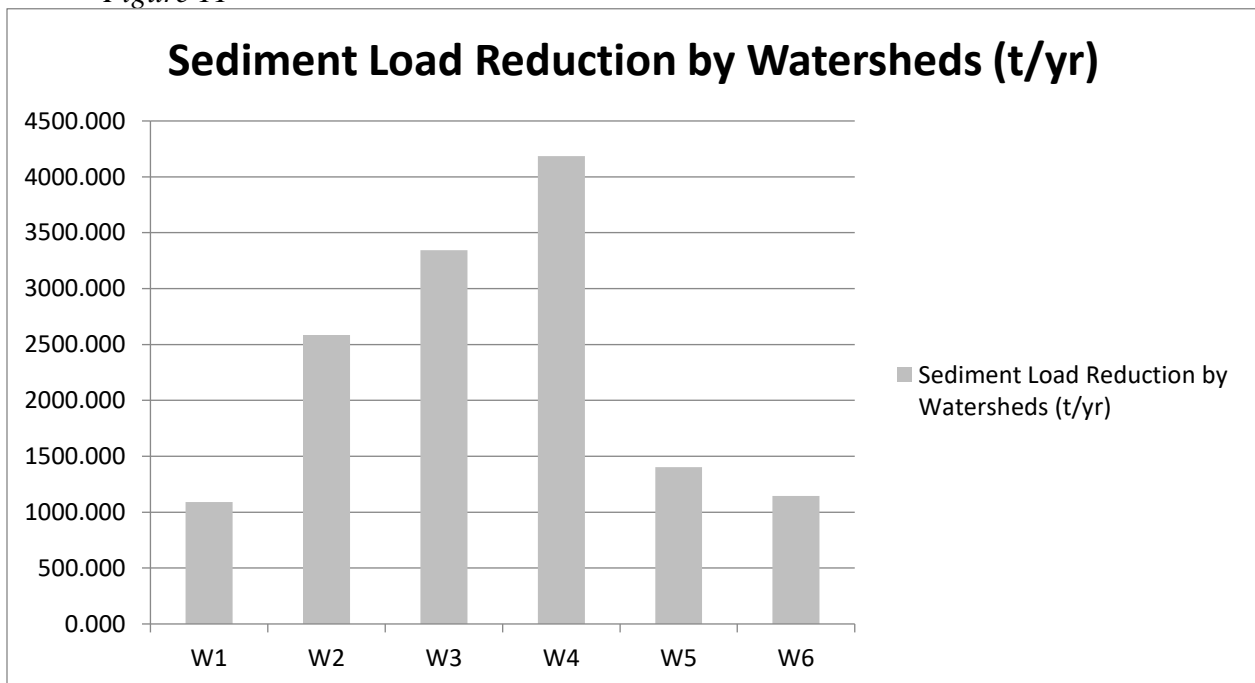


Figure 12 documents the total P load by land uses with BMPs in the Lower Yellow River Watershed.

Figure 12

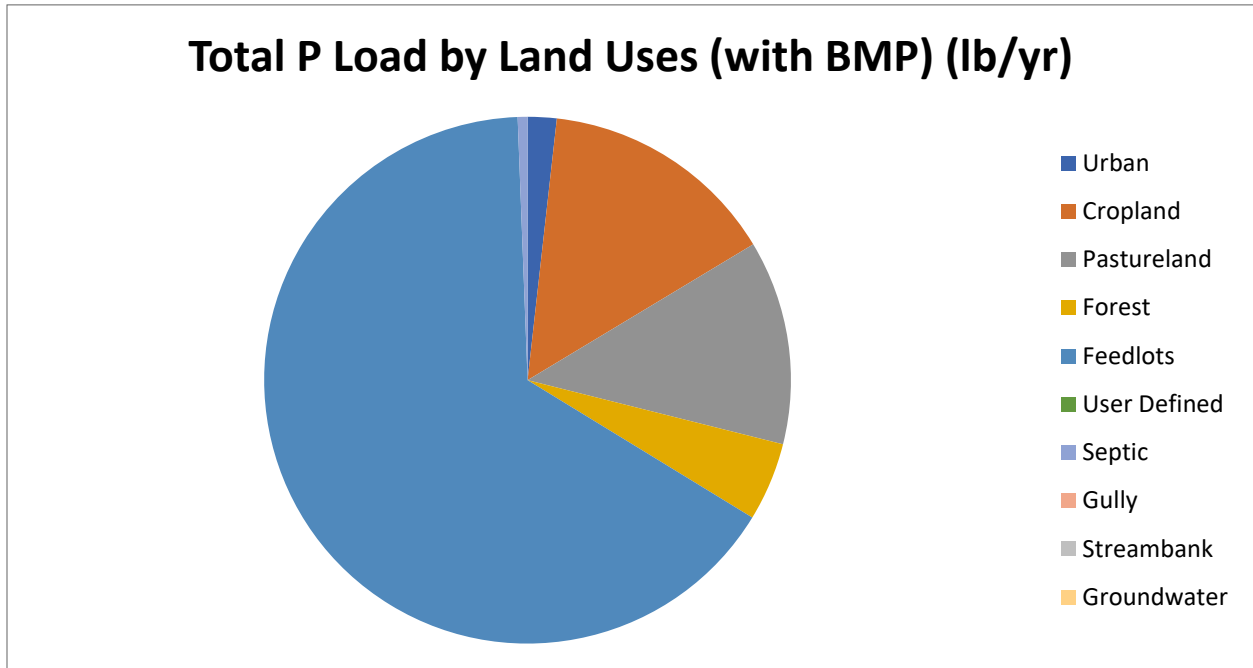


Figure 13 documents the total sediment load by land uses (with BMP) (t/yr.) in the Lower Yellow River Watershed.

Figure 13

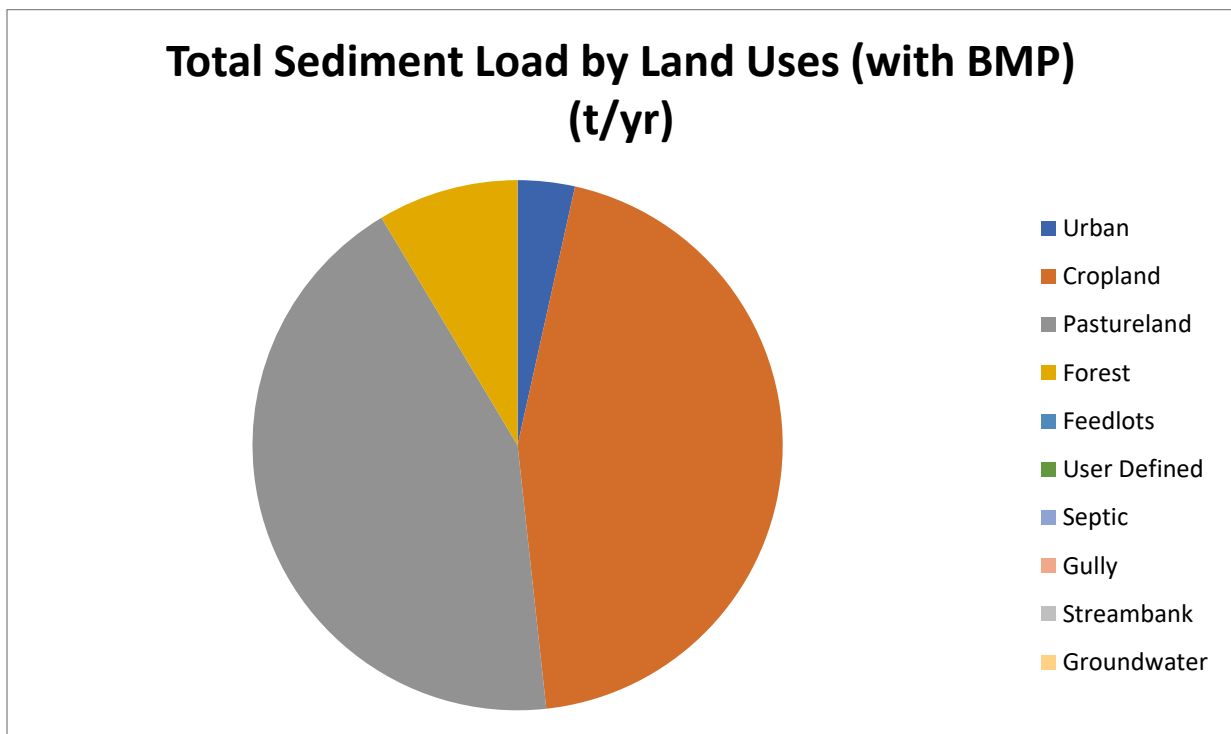
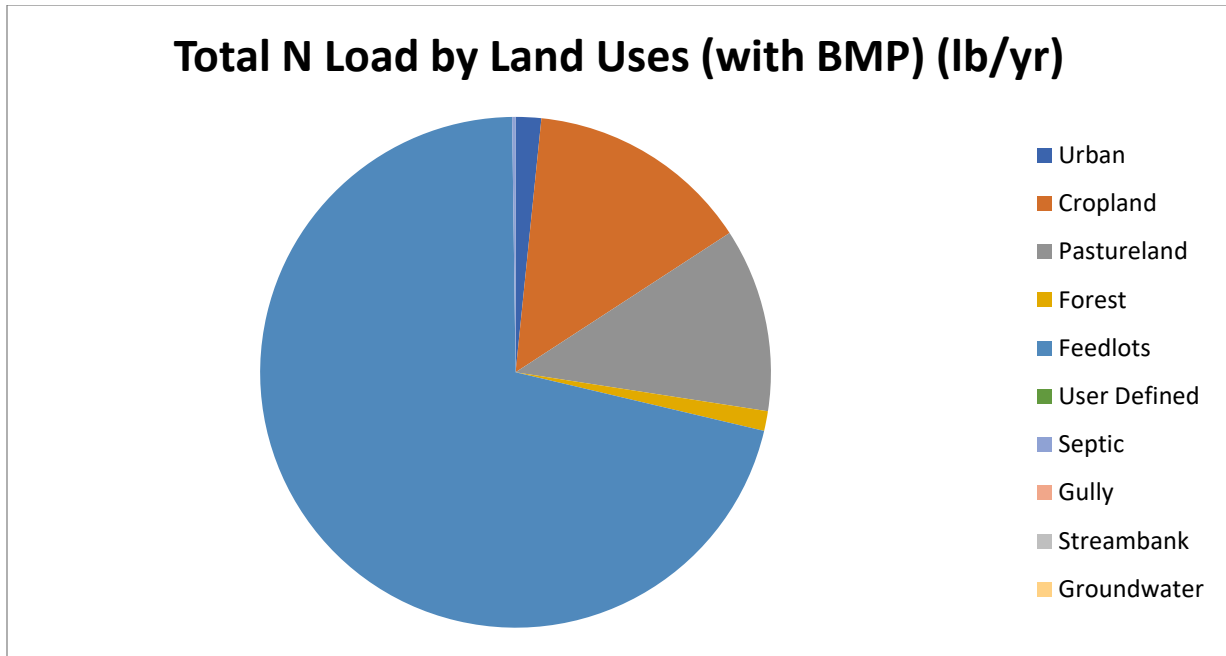


Figure 14 documents the total N load by land uses in the Lower Yellow River watershed.

Figure 14



In order to put STEPL modeling in context, it is possible to manipulate the model after the initial run to see just how many acres of practices need to be installed to reach this plan’s 54% phosphorus reduction goal as outlined in the DNR 2018 internal memo which was based upon BATHTUB modeling conducted by Pat Oldenburg((P. Oldenburg, Internal WDNR Memo, Appendix 2)The following tables convey four conservation practice scenarios for cash grain and dairy operations used within the STEPL model to reduce cropland pollutant loads within each Lower Yellow River HUC 12 sub-watershed. Each scenario has different types and extent of cropland management practices.

Cash Crop	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Current BMPs	Future BMPs	Future BMPs	Future BMPs	Future BMPs
HighRes+Buffer	HighRes+Buffer+Contour+NMP	HighRes+Buffer+Contour	HighRes+Buffer+CvrCrop+NMP	HighRes+Buffer+Contour+NMP+CvrCrop
100% cash crop acres	50% cash crop acres	50% cash crop acres	50% cash crop acres	50% cash crop acres
	HighRes+Buffer	HighRes+Buffer	HighRes+Buffer	HighRes+Buffer
	50% cash crop acres	50% cash crop acres	50% cash crop acres	50% cash crop acres

Dairy	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Current BMP	Future BMP	Future BMP	Future BMP	Future BMP
LowRes+NMP+Buffer	HighRes+NMP+Buffer+Contour	HighRes+NMP+Buffer+Contour	HighRes+NMP+Buffer+CvrCrop	HighRes+NMP+Buffer+Contour+CvrCrop
100% dairy acres	50% dairy acres	50% dairy acres	50% dairy acres	50% dairy acres
	LowRes+NMP+Buffer	LowRes+NMP+Buffer	LowRes+NMP+Buffer	LowRes+NMP+Buffer
	50% dairy acres	50% dairy acres	50% dairy acres	50% dairy acres

Table 11 shows the cumulative reductions from various combinations of conservation best management practices and whether they will meet or not meet this plans phosphorus reduction goals.

Table 11 Shows Percent Pollutant Load Reductions with Each Proposed Conservation Scenario as Proposed

	N Load (lb/yr)	P Load (lb/yr)	BOD Load (lb/yr)	Sediment Load (t/yr)
Baseline STEPL Load	649229.8	90969.5	1133402.5	6936.5
Baseline Reduction	394130.3	58530.4	6704.5	1047.6
Baseline Reduction	61%	64%	1%	15%
Conservation Scenario #1 + 0% of Feedlots Treated	629085.6	86574.0	1127230.2	5972.1
	20144.2	4395.5	6172.3	964.4
	3%	5%	1%	16%
Conservation Scenario #1 + 25% of Feedlots Treated	536770.6	73133.7	1127230.2	5972.1
	112459.2	17835.8	6172.3	964.4
	21%	19.6%	1%	16%
Conservation Scenario #1 + 50% of Feedlots Treated	444455.7	59693.4	1127230.2	5972.1
	204774.1	31276.1	6172.3	964.4
	46%	34.3%	1%	16%
Conservation Scenario #1 + 75% of Feedlots Treated	352140.7	46253.1	1127230.2	5972.1
	297089.1	44716.4	6172.3	964.4
	84%	49.1%	1%	16%
Conservation Scenario #2 + 0% of Feedlots Treated	633200.2	87176.6	1127237.7	5973.3
	16029.6	3792.9	6164.8	963.2
	3%	4%	1%	16%
Conservation Scenario #2 + 25% of Feedlots Treated	540885.3	73736.3	1127237.7	5973.3
	108344.5	17233.2	6164.8	963.2
	20%	19%	1%	16%
Conservation Scenario #2 + 50% of Feedlots Treated	448570.3	60296.0	1127237.7	5973.3
	200659.5	30673.5	6164.8	963.2
	45%	38%	1%	16%
Conservation Scenario #2 + 75% of Feedlots Treated	356255.4	46855.7	1127237.7	5973.3
	292974.4	44113.8	6164.8	963.2
	82%	49%	1%	16%
Conservation Scenario #3 + 0% of Feedlots Treated	632568.2	87513.0	1128856.6	6226.3
	16661.6	3456.5	4545.8	710.3
	3%	4%	0%	11%
Conservation Scenario #3 + 25% of Feedlots Treated	540253.2	74072.7	1128856.6	6226.3
	108976.6	16896.8	4545.8	710.3
	20%	18.5	0%	11%
Conservation Scenario #3 + 50% of Feedlots Treated	447938.3	60632.4	1128856.6	6226.3
	201291.5	30337.1	4545.8	710.3
	45%	33%	0%	11%
Conservation Scenario #3 + 75% of Feedlots Treated	355623.4	47192.1	1128856.6	6226.3
	293606.5	43777.4	4545.8	710.3
	83%	49%	0%	11%

Conservation Scenario #4 + 0% of Feedlots Treated	624359.3	86200.3	1126698.0	5889.0
	24870.6	4769.2	6704.5	1047.6
	4%	6%	1%	18%
Conservation Scenario #4 + 25% of Feedlots Treated	532044.3	72760.0	1126698.0	5889.0
	117185.5	18209.5	6704.5	1047.6
	22%	20%	1%	18%
Conservation Scenario #4 + 50% of Feedlots Treated	439729.4	59319.7	1126698.0	5889.0
	209500.4	31649.8	6704.5	1047.6
	48%	35%	1%	18%
Conservation Scenario #4 + 75% of Feedlots Treated	347414.4	45879.5	1126698.0	5889.0
	301815.4	45090.1	6704.5	1047.6
	87%	50%	1%	18%

**Yellow Highlights show scenarios that will meet or come within 5% of this plans 54% P reduction goal*

Table 12 Shows Conservation Scenarios Proposed and the Conservation Scenario Efficiencies

Scenario	Dairy - BMP & % Efficiency Table	Nitrogen	Phosphorus	BOD	Sediment	E. coli
1	High Residue + Buffer + Contour + NMP	0.73	0.95	ND	0.93	ND
2	High Residue + Buffer + Contour + NMP	0.73	0.95	ND	0.93	ND
3	High Residue + Buffer + Cover Crop + NMP	0.7	0.93	ND	0.9	ND
4	High Residue + Buffer + Contour + NMP + Cover Crop	0.78	0.96	ND	0.94	ND

Scenario	Cash Crop - BMP & % Efficiency Table	Nitrogen	Phosphorus	BOD	Sediment	E. coli
1	High Residue + Buffer + Contour + NMP	0.73	0.95	ND	0.93	ND
2	High Residue + Buffer + Contour	0.64	0.89	ND	0.93	ND
3	High Residue + Buffer + Cover Crop + NMP	0.7	0.93	ND	0.9	ND
4	High Residue + Buffer + Contour + NMP + Cover Crop	0.78	0.96	ND	0.94	ND

Table 13 showing load reductions if 25%, 50%, 75%, and 100% of cropland acres with adopted practice(s) scenarios 1-4 from Table 11 and corresponding phosphorus reduction in the watershed.

	0% Area	25% Area	50% Area	75% Area	100% Area
Conservation Scenario #1 Cropland (LBS of P)	0	1099	2098	3297	4396
Conservation Scenario #2 Cropland (LBS of P)	0	948	1896	2844	3793
Conservation Scenario #3 Cropland (LBS of P)	0	864	1728	2592	3456
Conservation Scenario #4 Cropland (LBS of P)	0	1192	2384	3576	4769

Legacy Phosphorus and Plan Implementation

One challenge that presents itself to improving water quality within agricultural dominated watersheds is legacy phosphorus in the cropland soils and deposited within stream channels.

In recent years, scientists and watershed managers are finding that water quality is not responding as well as expected to implemented conservation practices (Sharpley et al 2013). They are attributing this slower and smaller response to legacy phosphorus, primarily from cropland soils.

Legacy phosphorus is used to describe the accumulated phosphorus that can serve as a long-term source of P to surface waters. Legacy phosphorus in a soil occurs when phosphorus in soils builds up much more rapidly than the decline due to crop uptake. In stream channels, legacy phosphorus can result from upland sediment erosion followed by sediment deposition of particulate phosphorus, sorption of dissolved phosphorus onto riverbed sediments or suspended sediments, or by incorporation into the water column (Sharpley et al 2013). Therefore, water quality may not improve/respond to implementation of conservation practices in a watershed as quickly as expected due to remobilization of legacy phosphorus hot spots. Legacy phosphorus is a factor that will be considered in the Yellow River watershed when water quality monitoring is completed to assess plan implementation.

Over this plan's twenty-year schedule, it is important to monitor the functionality of BMPs implemented in the watershed periodically after their installation. Over time, BMPs can become less efficient at achieving designed pollutant reductions due to several factors.

According to the *USEPA Technical Memorandum #1: Adjusting for Depreciation of Land Treatment when Planning Watershed Projects*, natural variability, lack of proper maintenance and unforeseen consequences are primary causes of BMP depreciation. Considering how erratic and unpredictable weather patterns are increasingly becoming, checking BMPs in the watershed will be critical for assessing their performance. BMP performance data will be used to evaluate plan implementation, modeled load reduction estimates and to help determine if substantial progress is or is not being made toward attaining water quality standards.

To ensure installed BMPs are operated/maintained/performing over time, the Chippewa County Department of Land Conservation and Forest Management will monitor the condition and efficiency of selected conservation practices implemented in the watershed. This will be accomplished, in part, by using a Geographic Information System (GIS). Periodic BMP inspections will be conducted, especially after significant weather events, to determine if cropland or livestock based practices are continuing to function properly and reduce pollutant loads. Visual inspections and other methods of verification, as described in the U.S. Environmental Protection Agency Technical Memorandum #1, Adjusting for Depreciation of Land Treatment When Planning Watershed Projects, will be utilized during BMP inspections.

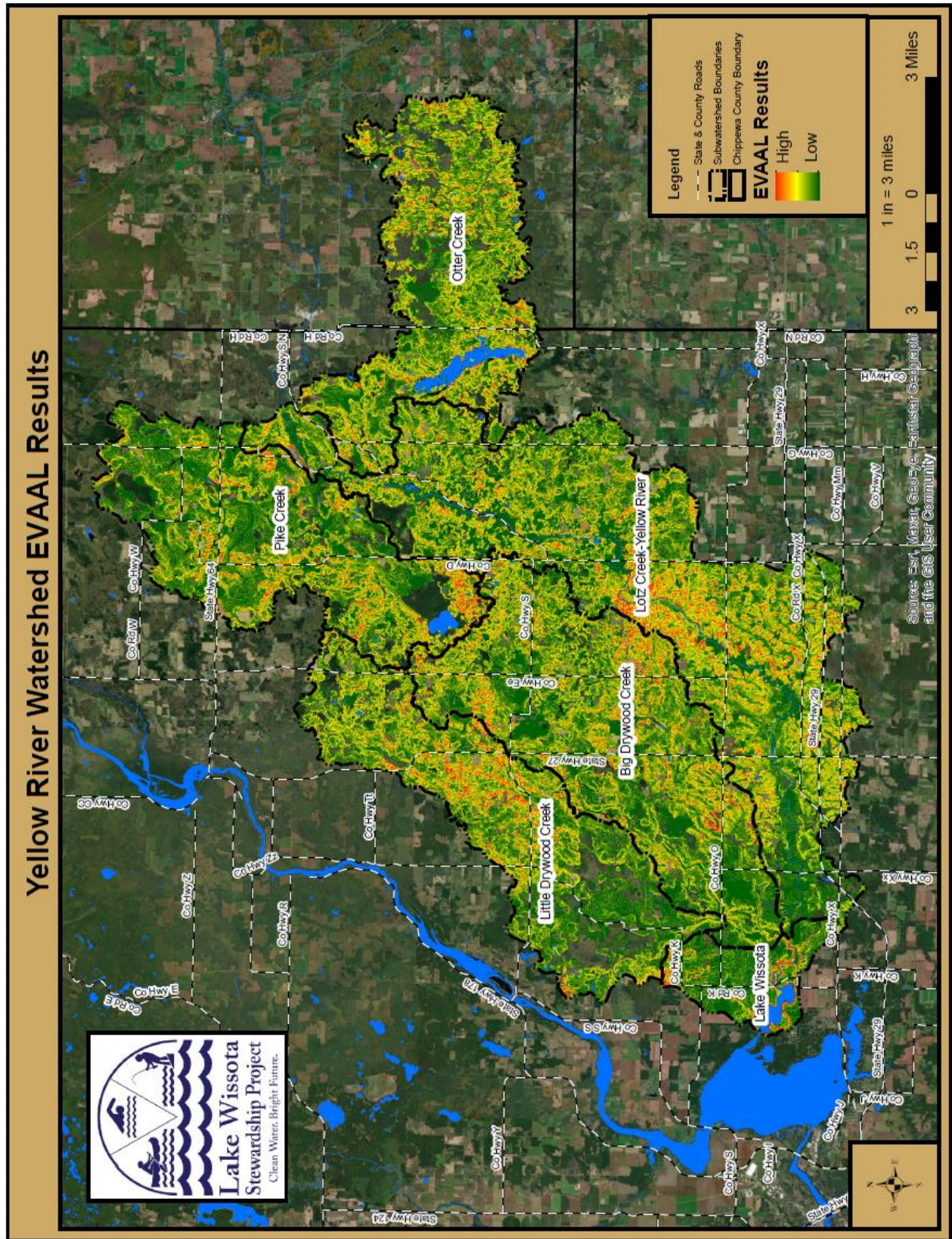
In the future, the Lake Wissota Stewardship Project will work with Wisconsin DNR to use of LANDSAT satellite data and remote sensing technology to track the implementation of cropping practices and corresponding crop residue levels within the Yellow River Moon Bay watershed over time.. Crop residue data will be tracked in a and used to revise future STEPL modeling to estimate changes in nonpoint source pollution loads within the watershed.

3.32 EVAAL Analysis Results

A description of the critical areas for BMPs within the Yellow River Moon Bay watershed have been compiled using the EVAAL analysis.

The EVAAL Model uses topography, soil type, rainfall, land cover, cropland types, and stream power to determine the risk of sheet erosion, rill erosion, and gully erosion. Areas not hydrologically connected to surface waters via surface flow are deprioritized. Map 15 confirms critical areas within each HUC 12 sub-watershed where there may be a higher risk for soil erosion. This map will be used with other maps in this plan to prioritize soil conservation work with specific landowners/fields in the watershed.

Map 14 shows the potential for erosion vulnerability in the Yellow River Watershed

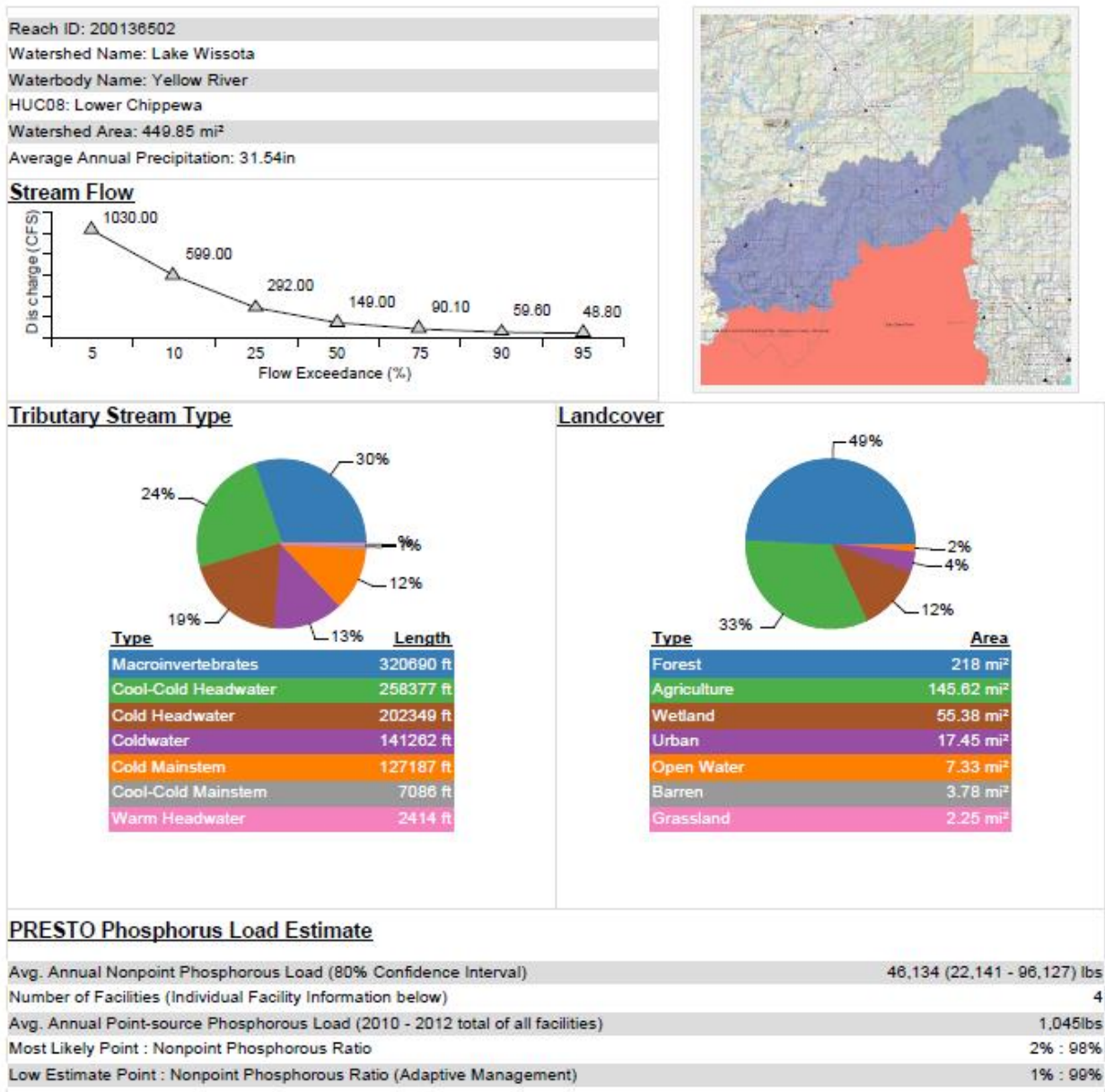


3.33 PRESTO Analysis Results

The Pollutant Load Ratio Estimation Tool (PRESTO) is a statewide GIS-based tool that compares the average annual phosphorus loads originating from point and nonpoint sources within a watershed. The comparison provides a screening tool for industrial and municipal dischargers to determine one of the conditions of eligibility for adaptive management as part of s. NR 217.18, Wisconsin Administrative Code.

Figure 15 documents the PRESTO Modeling for the Yellow River Watershed

PRESTO-Lite Watershed Delineation Report

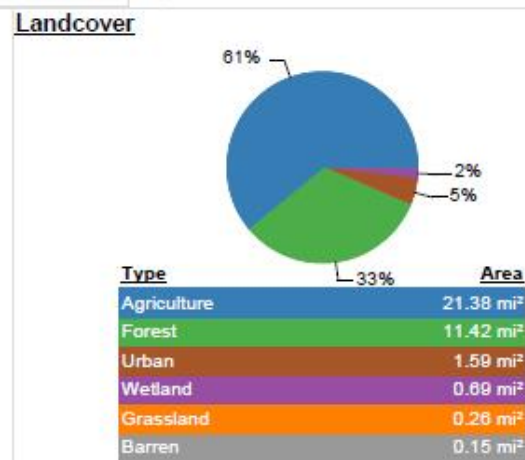
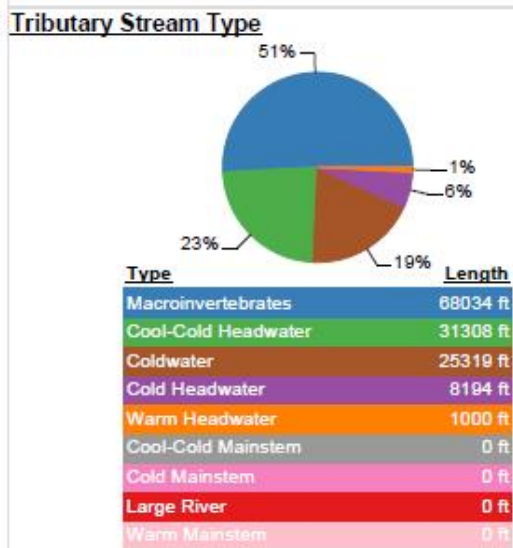
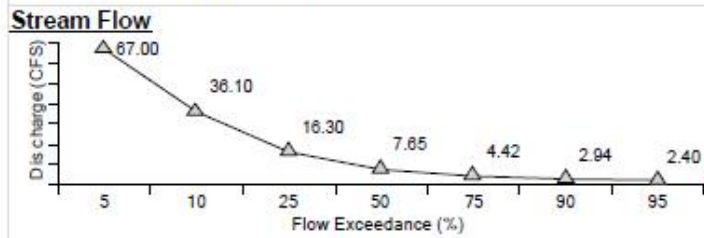
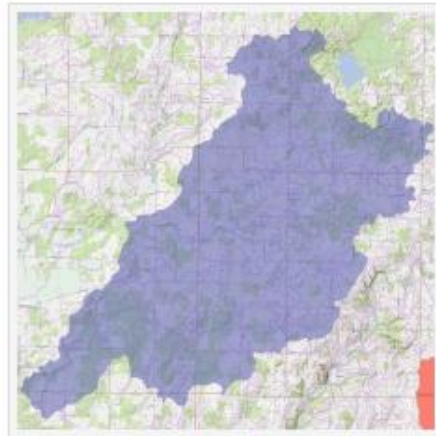


greater amounts of nutrient reduction.

Figure 16 documents the PRESTO Modeling for the Big Drywood Creek Watershed

PRESTO-Lite Watershed Delineation Report

Reach ID: 200138278
 Watershed Name: Big Drywood Creek
 Waterbody Name: Big Drywood Creek
 HUC08: Lower Chippewa
 Watershed Area: 35.55 mi²
 Average Annual Precipitation: 31.14in



PRESTO Phosphorus Load Estimate

Avg. Annual Nonpoint Phosphorous Load (80% Confidence Interval)	9,272 (4,244 - 20,258) lbs
Number of Facilities (Individual Facility Information below)	0
Avg. Annual Point-source Phosphorous Load (2010 - 2012 total of all facilities)	0 lbs
Most Likely Point : Nonpoint Phosphorous Ratio	0% : 100%
Low Estimate Point : Nonpoint Phosphorous Ratio (Adaptive Management)	0% : 100%

Figure 17 documents the PRESTO Modeling for the Little Drywood Creek Watershed

PRESTO-Lite Watershed Delineation Report

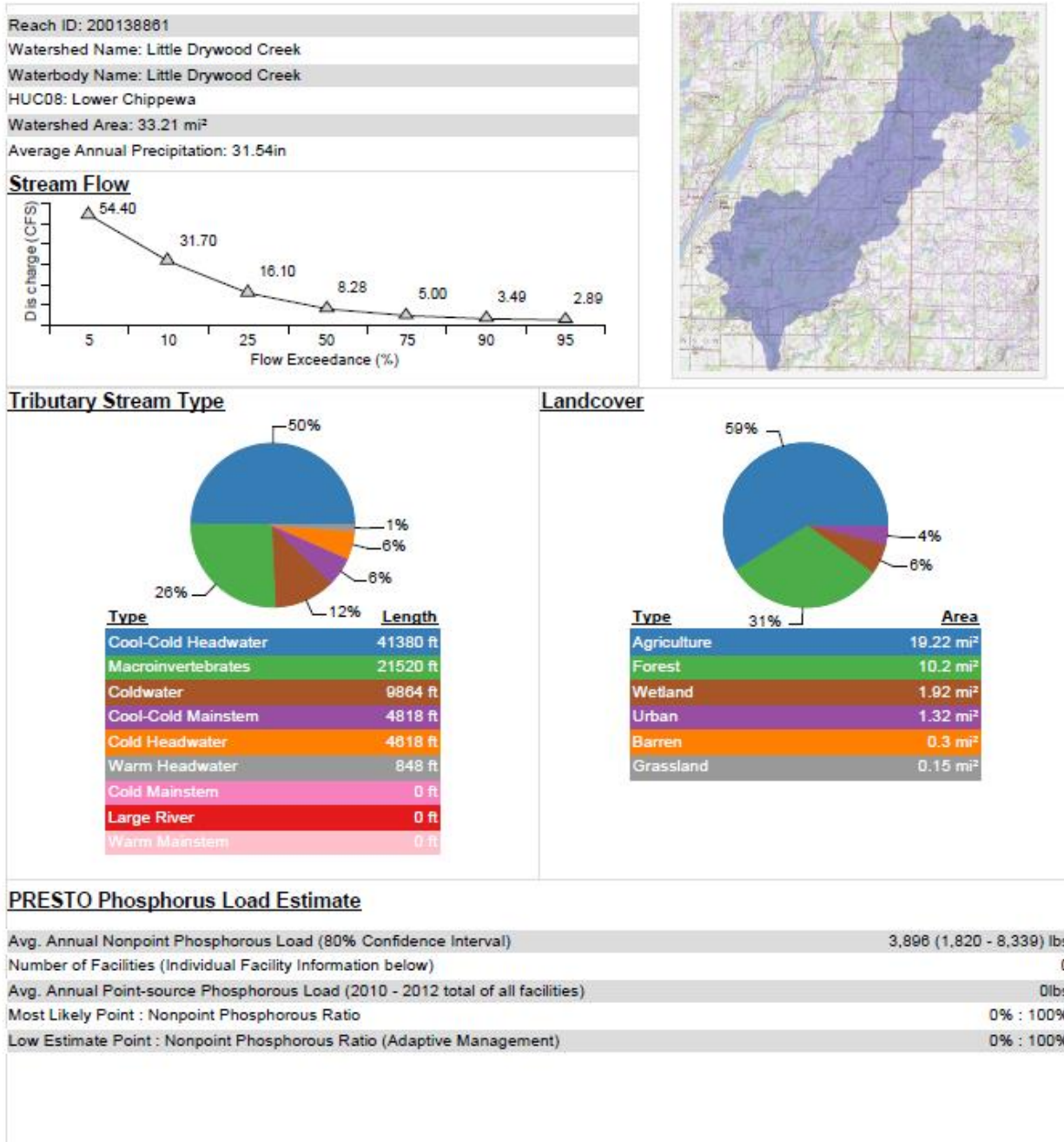


Figure 18 documents the PRESTO Modeling for the Pike Creek Watershed

PRESTO-Lite Watershed Delineation Report

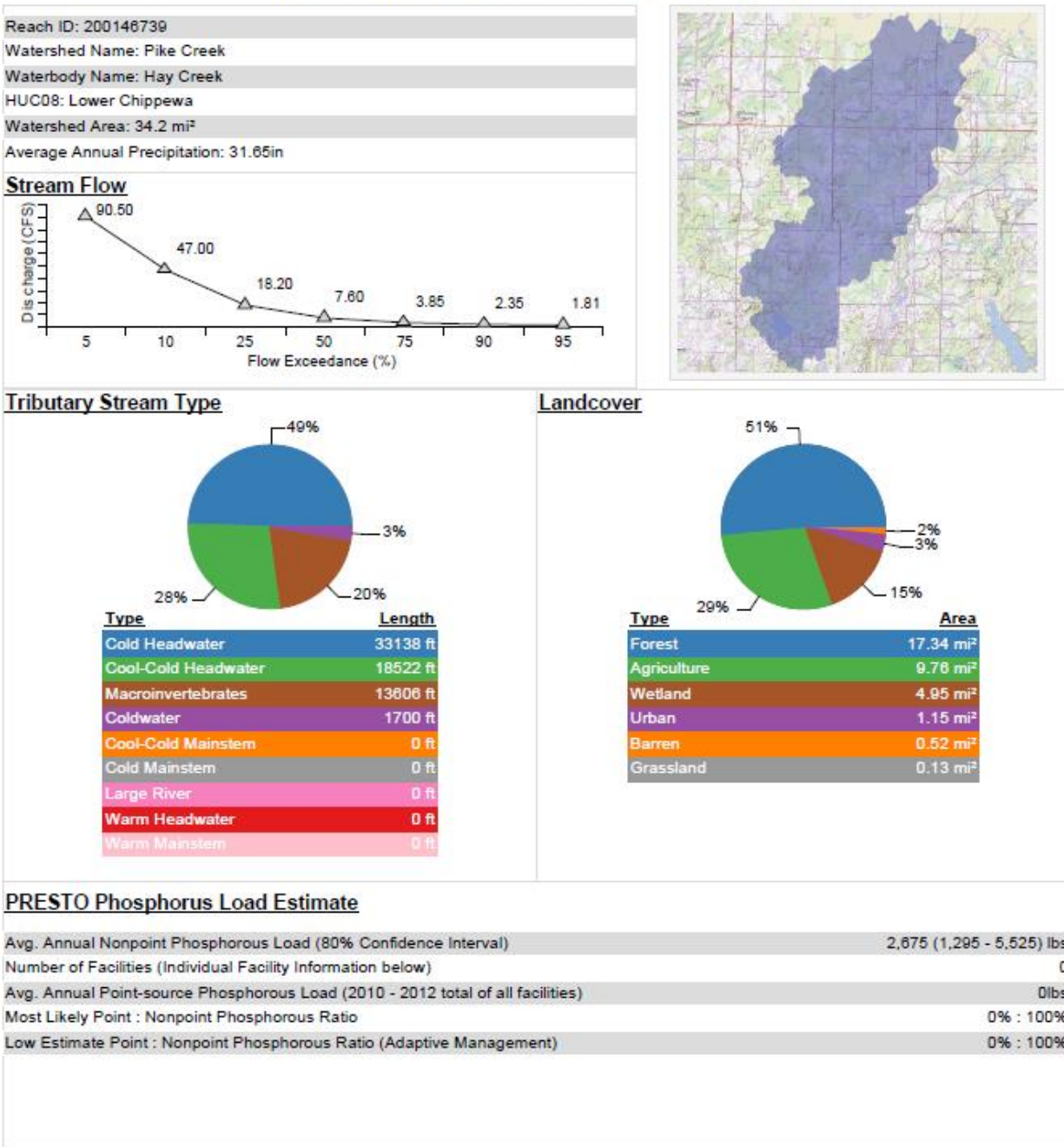
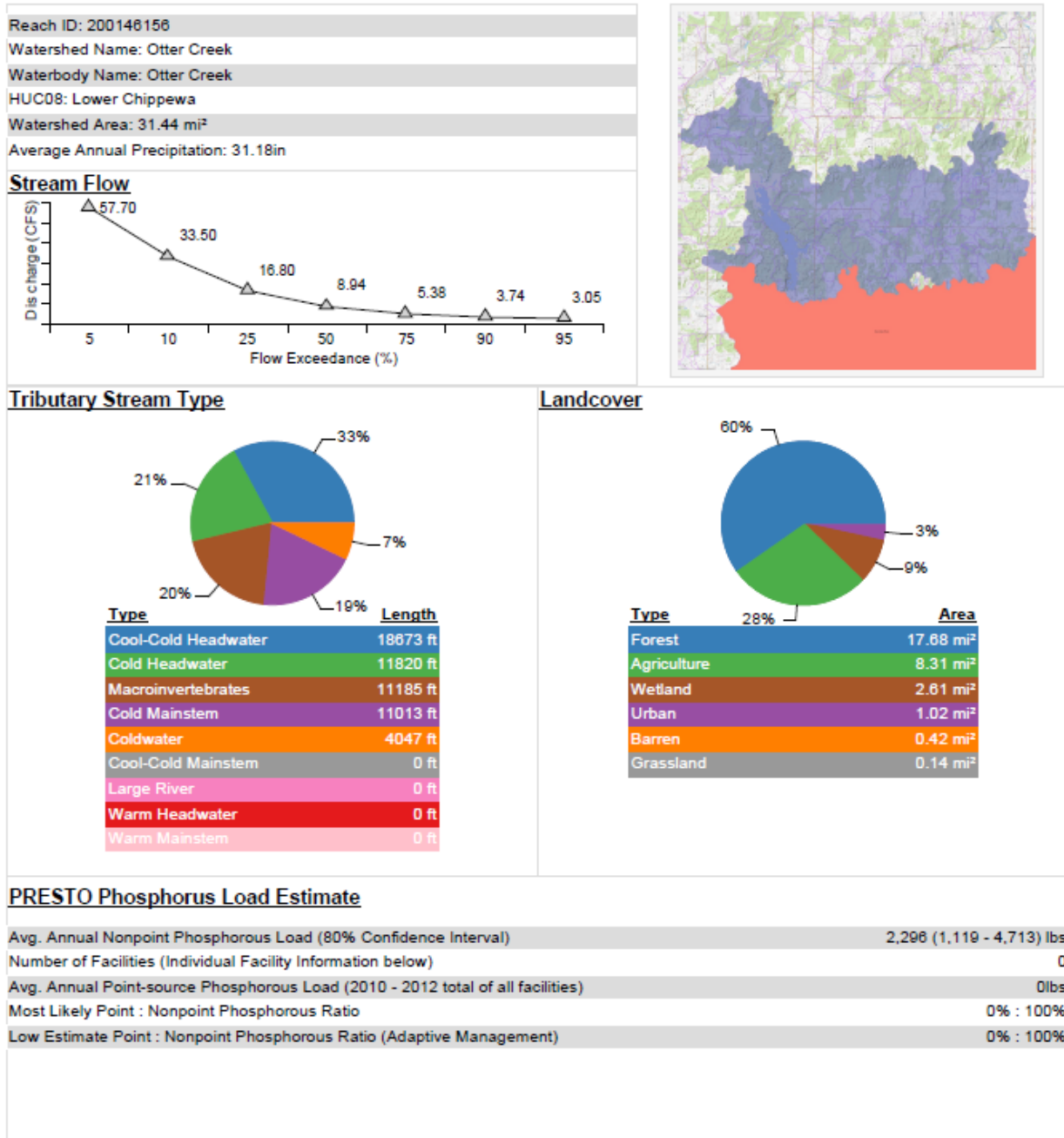


Figure 19 documents the PRESTO Modeling for the Otter Creek Watershed

PRESTO-Lite Watershed Delineation Report



The project will continue to install conservation projects in the lowlands such as stream buffers and wetland restorations but will also expand to include upland cropland BMPs such as contour farming, filter strips, and cover crops. Feedlot/Barnyard improvement projects will be perused as necessitated by NR151/FPP evaluations.

Element 4 - The Estimates of Technical and Financial Assistance, Costs, and Authorities

EPA guidance requires that a 9-Key Element Plan Provides:

“An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon to implement this plan.”, (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Page 2-15).

4.1 The Current Estimates of Technical and Financial Assistance, Costs, and Authorities

The Little Lake Wissota Stewardship Project was developed to determine and provide the type and amount of technical and financial assistance needed to implement a watershed management plan that would meet water quality goals and approved TMDL waste load allocations to reduce the severity and extent of algae blooms in Lake Wissota.

The project was and continues to operate as a public/private business model to achieve water quality goals. The Little Lake Wissota Stewardship Project worked with Jacob Leinenkugel’s Brewing Company as a main sponsor. The Lake Wissota Stewardship Project works with the Lake Wissota Improvement and Protection Association as a main sponsor. All funds were and continue to be distributed through the Community Foundation of Chippewa County.

The Lake Wissota Stewardship Project uses a three-tiered approach based upon the extent of community interest and investment in the project, and the extent of conservation benefits and environmental protection.

The LWSP uses a work plan and budget to systematically solicit and allocate resources to fund defined projects, seek donors, and apply for grants to leverage those private contributions.

The LWSP will continue the direct solicitation of private funds to continue implementation efforts over time. Private funds will be used to leverage state and federal grant.

The following budgets are the unaudited 5-year budgets for the Little Lake Wissota Stewardship Project and the Lake Wissota Stewardship Project

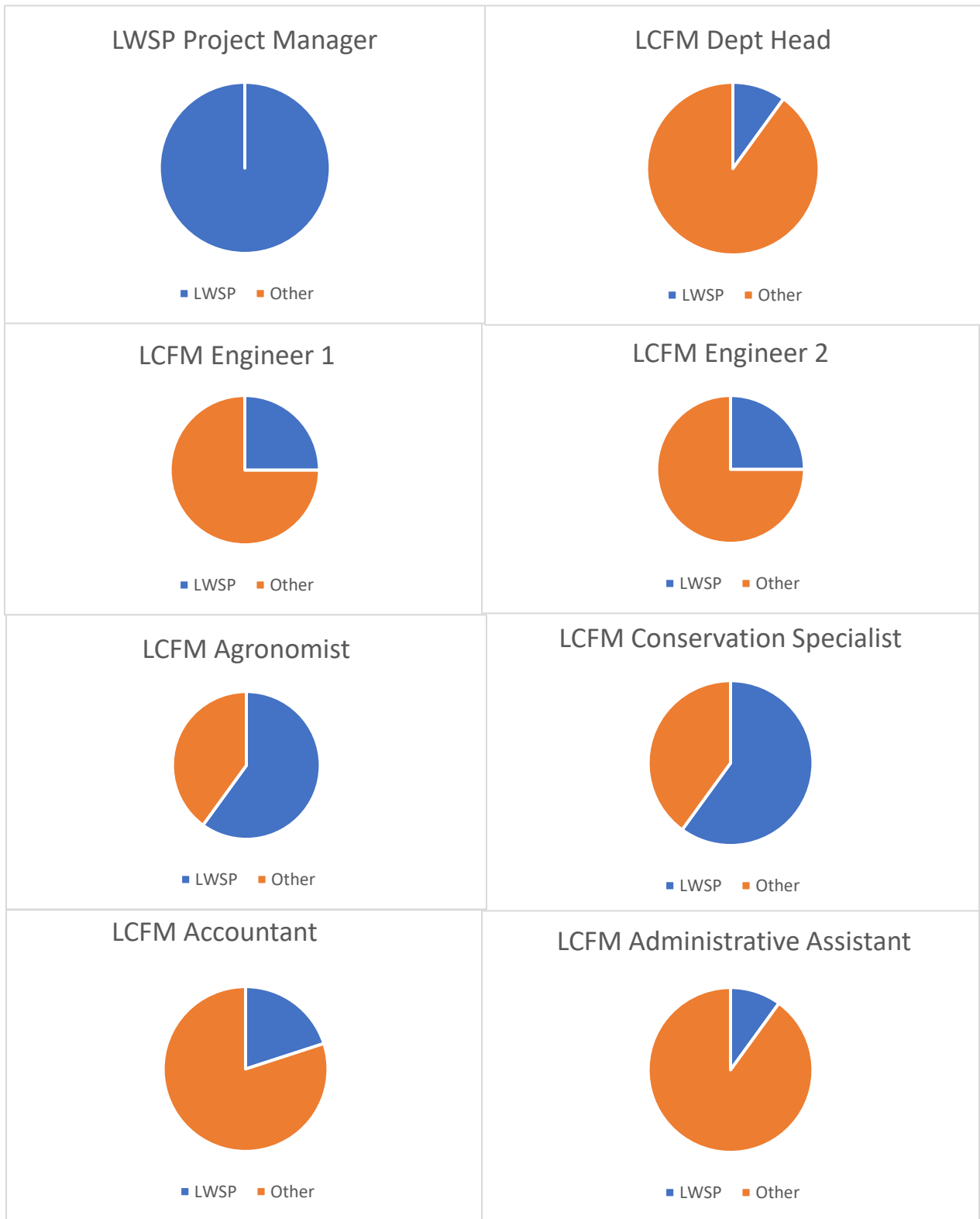
4.11 - Table 14 - The LWSP Current 5-year (2018-2023) Budget

LAKE WISCONSIN STEWARDSHIP PROJECT REVENUE AND EXPENDITURES SUMMARY										11/17/2020
REVENUE SOURCES:	2018 Budget	2018 Actual/Contracted	2019 Budget	2018 Actual/Contracted	2020 Budget	2020 Actual/Contracted	2021 Budget	2022 Budget	Budget Totals To Date	
Project, Planning, Coordination & Reporting										
COMMUNITY FOUNDATION	1	\$86,048	\$80,664	\$50,000	\$50,000	\$71,741	\$50,000	\$71,741	\$71,741	\$345,888
LWS ACCOUNT:	2	\$12,051	\$84,817	\$50,000	\$84,772	\$50,000	\$50,508	\$178,942	\$350,708	
Corporate/Foundations/Individual Contributions										
Conservation on the Land										
DATCP-SEG Funds	3	\$38,494		\$55,718		\$55,000		\$55,000		\$204,210
DATCP-Bond Funds		\$84,439	\$19,189	\$49,750		\$49,720	\$49,750			\$233,889
CREP (DATCP) Funds	4	\$16,378	\$16,378	\$294,000						\$310,378
DNR MDV	14	\$1,466			\$3,496	\$1,500	\$11,883	\$15,000		\$17,966
DNR TRM Small				\$150,000						\$150,000
DNR TRM Large (Little Lake Wisconsin)	5a			\$185,738				\$185,738		\$371,478
DNR TRM Large (Big Drywood Creek)	5a							\$200,000		
DNR Lake Protection Grant	5	\$30,000		\$30,000		\$50,000				\$110,000
DNR River Protection Grant						\$50,000				\$50,000
Wetland Reserve Easement						\$100,000		\$100,000		
DNR Wetland Mitigation In-Lake Fee Program Grant						\$787,708				\$787,708
Monitoring										
DNR River Planning Grant		\$5,625		\$7,500		\$7,500				\$20,625
DNR Lakes Planning Grant						\$30,000				\$30,000
SUBTOTAL		\$274,497	\$120,382	\$872,704	\$68,288	\$1,233,200	\$112,109	\$872,171	\$422,449	\$3,675,021
EXPENSES:										
Project, Planning, Coordination & Reporting										
Watershed Specialist	6 12	\$50,000	\$50,205	\$50,040	\$57,918	\$55,125	\$40,822	\$52,500	\$52,500	\$280,165
Red Cedar River Watershed Conference Fee		\$45	\$45	\$45	\$0	\$45		\$45	\$45	\$225
Contracted Services	13					\$35,000				
Conservation on the Land										
DATCP-SEG Funded Projects		\$38,494		\$5,000						\$43,494
DATCP-Bond Funded Projects		\$84,439	\$19,189	\$50,000			\$49,720			\$134,439
CREP Funded Projects		\$16,378	\$16,378	\$294,000						\$310,378
DNR MDV Expense	14	\$1,466				\$1,500		\$15,000		\$17,966
DNR TRM Small Project Expense				\$150,000						\$150,000
DNR TRM Large Project Expense	5b			\$185,738				\$385,738		\$571,478
DNR Lake Protection Grant Expense		\$30,000		\$30,000		\$50,000				\$110,000
DNR River Protection Grant Expense						\$50,000				\$50,000
DNR Wetland Mitigation In-Lake Fee Program Grant Expense						\$787,708				\$787,708
Wetlands Reserve Easement Expense						\$100,000		\$100,000		\$200,000
LWSP Funded Easement Project	7									\$0
LWSP Funded Scrapes Projects		\$19,425	\$16,025	\$4,500	\$4,500					\$23,925
LWSP Funded Planting Projects		\$18,048	\$14,839	\$0	\$3,426					\$18,048
OutReach										
Conservation/Community Outreach Project Reserve	11			\$9,375						\$9,375
Location Signage		\$1,500	\$2,214							\$3,714
Conventions and Meetings						\$200				\$200
Volunteer Costs				\$500		\$500				\$1,000
Postage and Mailing						\$1,000				\$1,000
Supplies				\$1,000	\$1,022	\$1,000				\$3,022
LWSP Website Domain				\$180	\$132	\$180	\$147	\$180	\$180	\$629
Project Costs (Info/Education Materials)	8	\$100	\$248	\$2,500		\$2,500	\$30			\$5,178
Monitoring										
Monitoring- Boy Scouts	9	\$2,000	\$1,440	\$2,000	\$1,288	\$2,000		\$2,000	\$2,000	\$10,000
DNR River Planning Expense		\$5,625		\$7,500		\$7,500				\$20,625
USGS River Monitoring Station								\$16,000		\$16,000
DNR Lakes Planning Grant Expense						\$30,000				\$30,000
Donation of Services			\$4,500							\$4,500
SUBTOTAL		\$287,518	\$120,382	\$501,378	\$68,288	\$1,104,288	\$99,519	\$571,463	\$54,725	\$2,799,340
ENDING BALANCE:		\$8,881	\$0	\$71,328	\$0	\$128,842	\$12,680	\$300,708	\$387,724	
FINAL ENDING BALANCE *	10									

*Unaudited

4.12 The Current 2017-2021 Staff Time Allocations

Figure 20



4.2 The Proposed Non- Point Source Technical and Financial Assistance, Costs, and Authorities

4.21 The Proposed Technical and Financial Assistance Needs

The WDNR derived reduction goals for the Yellow River watershed are to reduce phosphorus by 54% to achieve the in-lake water quality goals.

To meet the WDNR pollution reduction goals in the next 20 years, the estimates of technical and financial resources needed are as follows:

- The equivalent of 1.0 Full time Employee (FTE).
- Technical support from Chippewa County LCFM employees/other cooperating agencies.
- A total revenue of \$10,000,000 to meet load reduction goals.

All cost share rates are calculated using current 2020 rates.

Table 15: STEPL Scenarios and Cost Share Rates

Scenario	# of Acres	Cost Share Rate	Total Cost
STEPL Scenario #1 High Residue + Buffer + Contour + NMP	18,377 acres	40\$/acre NMP** 188\$/acre Buffer	\$735,080 <u>\$ 55,278</u> \$790,358
STEPL Scenario #2 High Residue + Buffer + Contour + NMP	18,377 acres	40\$/acre NMP** 188\$/acre Buffer	\$735,080 <u>\$55,278</u> \$790,358
STEPL Scenario #3 High Residue + Buffer + Cover Crop + NMP	18,377 acres	40\$/acre NMP 188\$/acre Buffer 40\$/acre C. Crop**	\$735,080 \$55,278 <u>\$735,080</u> \$1,525,438
STEPL Scenario #4 High Residue + Buffer + Contour + NMP + Cover Crop	18,377 acres	40\$/acre NMP 188\$/acre Buffer 40\$/acre C. Crop**	\$735,080 \$55,278 <u>\$735,080</u> \$1,525,438

* = Buffer area = 35ft x 800 ft = 28,000 sq ft = 0.64 acres; each buffer treats/receives runoff from 40 cropland acres

** = Cost share rates for NMP or Cover Crop practices include less/no tillage to meet high (>60%) crop residue on fields

As previously outlined in this plan, the extent of implementation is directly proportionate to the level of community and agency support.

Feedlot Cost Estimates

Watershed	Number of Problem Feedlots	Acres of Problem Feedlots *	75% of total problem feedlots receive BMPs (Runoff Collection and Storage)	Feedlot BMPs* Cost Share Rate (average)	Total Cost
Lake Wissota	1	1.1	1	50,000\$/lot	\$50,000
Little Drywood	18	45.7	14	50,000\$/lot	\$700,000
Big Drywood	16	62.4	12	50,000\$/lot	\$600,000
Lotz Creek/Yellow River	44	129.4	33	50,000\$/lot	\$1,650,000
Pike Creek	15	34.4	11	50,000\$/lot	\$550,000
Otter Creek	3	17.4	2	50,000\$/lot	\$100,000
Total	97	290.4	73		\$3,650,000

* = Average Feedlot Cost and size was estimated by Chippewa Land Conservation Dept staff using appx 20 existing feedlots in the watershed

Plan Cost Summary

\$10 million = Total Cost for the 20-year plan = \$500,000/year

\$1.5 million = Cropland practices

\$3.6 million = Feedlot practices

\$4.9 million = Staff costs for: Technical Assistance, Education and Outreach, NR 151 compliance, Project Planning and Reporting, BMP verification, WQ monitoring.

4.22 The Cost Containment Strategy

Budget and cost share estimates were determined based on the following:

- The historical record of the best management practices installed in the adjacent LLW project area and the associated costs during the 2009-2017 project implementation period.
- The type of best management practice (structural or cropping) that would be funded.
- The anticipated number of farms that would be evaluated to determine compliance with NR151 performance standards, and the practices that would be installed with the funds.
- Cost share portions of each project will come from the landowner or local contributions from community donations.

To contain costs for cropping practices, the following measures will be used:

- To achieve maximum efficiency and environmental benefit, lowest cost upland cropping practices (e.g., contour farming, nutrient/residue management) will be administered as a priority per ATCP 50.42-
https://docs.legis.wisconsin.gov/code/admin_code/atcp/020/50/v/42
- Full farm treatments will be encouraged to meet NR151 cropland and livestock performance standards and prohibitions.
- Maximum cost share limits will be set to be consistent with flat rates used by the USDA as eligible under the EQIP program.

To contain costs for structural practices, the following measures will be used:

- A general excavating contractor with direct experience installing sediment basins, diversions, and wetland restorations in the project area will be contracted for all earth work.
- Project construction plans will be developed for all contracted work.
- Flat rates will be used for all wetland restorations and stream buffers.

The following cost containment measures will be used for both structural and cropping best management practices:

- To increase compliance with NR151 agricultural performance standards, all farms seeking funds will be required to participate in an NR151 evaluation to identify needs.
- Other sources of funding will be used instead of and in conjunction with these funds to gain maximum environmental benefit efficiency.
- Any complex designs exceeding \$30,000 will be put out for competitive bids.

4.23 The Fiscal Strategy and Financial Sources

To encourage participation in farm evaluations and certification program, and to optimize the use of available cost-share funds, the county will attempt to dovetail state funds with federal funds to increase the public cost-share rate for operations that seek to meet the state's agricultural performance standards and prohibitions.

In circumstances where cost-share funding is required to support non-voluntary enforcement action, the county will attempt to secure state grant funding available through state programs.

To optimize funds, CREP will be used for wetland restorations, stream buffers, and easements. TRM grants and other funding sources will be used to cost share cropping practices.

Cropping practices, to decrease P load using the least amount of funding, will be prioritized over livestock practices.

The LWSP recognizes that something is always limiting

- Time
- Money
- Skillsets
- Project Momentum

From 2009-2017, the average cost for phosphorus reduction was about \$2,846 per pound. However, most of the reductions were achieved via higher cost structural vs. lower cost cropping practices.

As in the past, the Lake Wissota Stewardship Project will rely on a broad range of funding sources from public and private sources to implement this twenty-year plan.

Table 16 documents the Lake Wissota Stewardship Project funding source timeline.

Table 16

	2021	2026	2031	2036	2040
Project Administration, Planning, and Coordination	LWIPA Community Foundation				
Conservation on the Land	CREP DATCP SEG DATCP Bond DNR TRM DNR MDV				
Monitoring	WDNR Lake Planning				
Outreach					

The Lake Wissota Stewardship Project will continue to rely on its associations with the Chippewa County Land Conservation and Forest Management Department, along with the rights granted in Wisconsin Administrative Code Chapter 92.

MDV Funding

Chippewa County LCFM currently receives multi-discharger variance funding. MDV funds are generated from some municipal and industrial point sources that discharge phosphorus pollution and elect to participate in the program to offset their water quality impacts with funding non-point source and phosphorus based reduction practices and controls. The LWSP plans to continue using MDV funds in the Yellow River watershed to fund non-point source phosphorus and sediment reduction practices.

Ice Age Trail Alliance

A large portion of the Ice Age Trail preferred corridor falls within the Yellow River Watershed between Otter Lake and the City of Cornell. If possible, the LWSP and LCFM will work with the Ice Age Trail Alliance to target landowners in the corridor for land acquisition, easements, conservation practices, and land retirement.

4.24 - Table 17 - Grant Application Timeline and Strategy:

Grant	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Large Scale TRM	x			x			x			x			x			x			x	
Lake Protection		x			x			x			x			x			x			x
River Protection			x			x			x		x		x		x			x		

Successful grant applications to DNR and other sources of funding will depend, in part, upon this plan’s content, including HUC 12 and critical area prioritization efforts, landowner interest and participation, ability to use TRM money to achieve phosphorus reductions and the total amount of money needed to reach implementation water quality goals.

4.25 The Financial Obstacles previously encountered in Implementation

- TRM Grants only cover 70% of Project Implementation
- Land is leased in short term 1–3-year contracts
- Increasing trend of cash grain annual tillage cropping replacing small dairy perennial pasture-based operations in watershed??

NR 151 implementation strategy

Existing runoff management standards have been established by the State of Wisconsin. Chapter NR 151 provides runoff management standards and prohibitions for agriculture. This plan recommends enforcement of the state runoff agricultural standards, when necessary, to help meet implementation goals and also create a level playing field for producers who meet NR 151 standards and those that do not. In instances of NR151 noncompliance or complaints, The LCFM and LWSP will use the MOU with the Wisconsin DNR included in appendix 4 and 5. A Notice of Intent (NOI) will be sent to the landowner or producer, an NR151 report will be completed and filed, and the producer or landowner will be offered cost share to come into NR151 compliance. NR151 compliance cost share funds will come from various sources, including TRM and NOD grants.

Chippewa County Land and Water Conservation and DNR will collaborate per the MOU when working with landowners in the Yellow River watershed to implement conservation practices, obtain compliance with the NR 151 standards and meet this plan's reduction goals. Landowners will be educated on programs and funding available to them as well as current state and local agricultural regulations. LCFM and LWSP will consult with DNR annually regarding the NR151 Implementation MOU.

Meetings between Chippewa County and WDNR Nonpoint Source staff to review and discuss NR151 implementation efforts in the Yellow River Watershed will be also completed annually or every other year. Items for review will include, but not be limited to, 1-6 below:

1. Do plan implementation efforts for agricultural cropland/operations in the watershed reflect the following priorities:
 - Priority 1 - Achieve compliance with NR 151 performance standards on a majority (>70%) of agricultural acres/operations in HUC 12 sub-watersheds*
 - Priority 2 – After a majority of agricultural cropland or operations in the watershed* are found in compliance with existing NR 151 standards, then adoption of additional practices on agricultural acres/operations already in compliance with NR 151 is completed to further reduce pollutant loads from agricultural sources in watershed.
- * = NR 151 Implementation/Compliance rates may vary within the watershed and require dividing the watershed into sub-basins.
2. If Priority 1 is not met, then how and when can plan implementation efforts change to meet Priority 1?
 3. Complete annual watershed inventory to determine current number agricultural cropland acres/farms - out of total number of cropland acres/farms in watershed -that are complying with NR151.
 4. Identify how many cropland acres/farms in watershed have received/been documented in compliance with NR 151 via letter.
 5. Review copies of NR 151 compliance letters with WDNR staff.
 6. Summarize NR 151 priorities, compliance inventory and documentation efforts within annual 9 key element plan progress reports.

Element 5 - The Information and Education Component

EPA guidance requires that a 9-Key Element Plan Provides:

“An information and education component used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the Agricultural Non-Point source management measures that will be implemented.”, (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Page 2-15).

5.1 The Information and Education Component

The Information & Education strategy for this plan includes the following: goals, messages, target audiences, delivery mechanisms.

A detailed summary of outreach activities, including target audiences, message, responsibility party, cost, etc., is developed annually by the Lake Wissota Project Team (Lake Wissota Stewardship Project; 2015 Outreach Activities). A similar approach will be used within the Yellow River watershed over this plan’s twenty-year schedule.

5.11 The Information and Education Strategy

Table 18 documents the Lake Wissota Stewardship Project; Information & Education Strategy”, (LCFM, 2010)

Goal 1: Increase public appreciation of the land and water resources in the Yellow River basin					
Message	Target Audience	Delivery Mechanism	Date	Party	Cost
There are diverse local recreational opportunities	General public, tourists	Tourism Guide	Annual	LWSP	\$500
Our land and water resources make this a great place to live	Landowners/ Growers in select HUC 12's	Lake Fairs, Booths	Annual	LWSP	\$500
Clean and plentiful water is a community asset	General Public, Landowner/ Growers, Shoreland Owners	Signs	Annual	LWSP	\$250
Goal 2: Increase public awareness that the Lake Wissota Stewardship Project is a community effort to improve water quality in Yellow River watershed streams and Moon Bay.					
Message	Target Audience	Delivery Mechanism	Date	Party	Cost
Everyone is responsible for improving the quality of our resource	General public, sponsors	Brochures, Meetings, Workshops, Booths	Annual	LWSP	\$500
Everyone can participate	Landowners, Growers, Shoreland owners	Website, Workshops	Annual	LWSP	\$500
We need your help	Sponsors, Landowners/ Growers in select HUC 12's	Meetings	Annual	LWSP	\$250
Progress is being made	All	Annual Report	Annual	LWSP	\$250
Goal 3: Increase public awareness of the local ecological and biodiversity					
Message	Target Audience	Delivery Mechanism	Date	Party	Cost
There are many native plant communities in the basin	Landowners	Lake Fairs, Booths	Annual	LWSP	\$250
Wetlands provide unique habitat and ecological functions	Landowners	Tours	Annual	LWSP	\$750
Many different species of wildlife live in the basin	General Public, landowners	Tours	Annual	LWSP	\$750
Goal 4: Inform agricultural landowners/growers of the plan objectives, milestones, timeline, and BMP project opportunities					
Message	Target Audience	Delivery Mechanism	Date	Party	Cost
Financial and technical assistance is available	Landowners/ Growers in select HUC 12s	Direct Mailings, Contacts	Annual	LWSP	\$2,500
Wetland Restorations and Stream buffers promote biodiversity	Landowners/ Growers in select HUC 12s	Direct Contact, Meetings	Annual	LWSP	\$2,500
Conservation easements are a financial incentive to permanently protect the investment	Landowners/ Growers in select HUC 12s	Direct Contacts, Meetings	Annual	LWSP	\$2,500
Goal 5: Raise awareness of NR151 Performance Standards and Prohibitions					
Message	Target Audience	Delivery Mechanism	Date	Party	Cost
TBD in 2022 Work Plan	Ag Producers	TBD in 2022 Work Plan	Annual	LWSP	TBD in 2022 Budget Plan
TBD in 2022 Work Plan	Rural Landowners	TBD in 2022 Work Plan	Annual	LWSP	TBD in 2022 Budget Plan
Goal 6: LWSP is a community driven initiative that is available to assist farmers and landowners to meet standards and water quality goals					

Message	Target Audience	Delivery Mechanism	Date	Party	Cost
TBD in 2022 Work Plan	Ag Producers	TBD in 2022 Work Plan	Annual	LWSP	TBD in 2022 Budget
TBD in 2022 Work Plan	Rural Landowners	TBD in 2022 Work Plan	Annual	LWSP	TBD in 2022 Budget
Goal 5: Lake front owners are critical to the community model for their contributions of time and money					
Message	Target Audience	Delivery Mechanism	Date	Party	Cost
TBD in 2022 Work Plan	TBD in 2022 Work Plan	TBD in 2022 Work Plan	Annual	LWSP	TBD in 2022 Budget

5.12 Direct Mailings

From 2009-2017, as project capacity increased, the Little Lake Wissota Stewardship Project systematically sent direct mailings to inform landowners of opportunities to install cost shared conservation practices. The direct mailings were completed on a sub watershed basis in the Little Lake Wissota Watershed and served to give anybody with improvable lands access to funding and cost sharing opportunities. There was about a 25% response rate to direct mailings. Direct mailings will be used in the Yellow River Watershed to distribute funds to eligible landowners.

5.13 Community Volunteer Events

Each year, the Lake Wissota Stewardship Project hosts a volunteer tree planting event with Jacob Leinenkugel Brewing Company through the “Canoes for A Cause” national event. Each year, the event has a site in the Yellow River and Little Lake Wissota Watershed.

The “Canoes for A Cause” event is held annually at a local venue on Lake Wissota. Participants are bused to 2-4 individual locations throughout the watershed to plant trees at newly contracted buffer installation projects.

Figures 21 and 22 show volunteers before and during a “Canoes for a Cause” tree planting event.



Figure 21



Figure 22

5.14 Environmental Watershed Curriculum

As part of the Duncan Creek Watershed Project, Chippewa County LCFM developed a water resource-based curriculum at a grade school level. This curriculum was implemented to campers at Wisconsin Farmers Union Kamp Kenwood on Lake Wissota in the fall of 2018. In 2019, the Chippewa County LCFM signed a 3-year contract with Wisconsin Farmers Union Foundation to develop and implement a watershed based education curriculum. This watershed curriculum was completed in 2019 and implementation will continue with the WFU Foundation in 2020 and 2021. This curriculum uses information from both the Little Lake Wissota and Yellow River 9-Key Element Plans.

5.15 Project Signage

In the fall of 2017, the Lake Wissota Stewardship manufactured 9 signs to recognize landowners for their commitment to water quality and help the public recognize conservation efforts in the watershed. Signs were installed at high traffic project locations along state and county highways in both the Little Lake Wissota and Yellow River Watersheds.

Figure 23 shows a sign installed in a high traffic area at a tree planting and wetland scrape.

Figure 23



5.2 The Proposed Information and Education Component

As the project moves into 2021, it is anticipated that more educational and informational components will be added to reflect this plan's phosphorus reduction goals and milestones.

Signs at the location of conservation projects will continue to be installed to recognize landowners for their permanent commitment to water quality in the watershed.

The Lake Wissota Stewardship Project team will continue to develop annual outreach activities within the Yellow River watershed HUC 12 sub-basins. There are no proposed changes or refinements from the existing watershed management plan approach.

The Lake Wissota Stewardship Project will continue to work with Leinenkugel's Brewing Company to hold the "Canoes for A Cause" volunteer tree planting event each spring and will be used to promote understanding of this plan by watershed residents.

Agricultural landowners and producers will be contacted for BMP installation in the following ways:

1. Small group targeted mailings
2. LCFM response to proposed manure expansion and expansion projects
3. LCFM response to AEA contract additions and certifications
4. CREP inquiries that NRCS forwards to LCFM
5. Small group meetings of landowners within selected Yellow River HUC 12's to focus upon critical area/high risk erosion fields.

The LWSP will, in 2022, compile and maintain a list of farm producers who lease land in the Yellow River Watershed to focus education and outreach efforts and to create a contact/coordination list for project participants that are non-producers and/or absentee landowners.

5.21 The Proposed Information and Education Component Schedule

Table 19 documents the Lake Wissota Stewardship Project Education/Outreach activities in the Yellow River Watershed 2021-2041.

Lake Wissota Stewardship Project Education/Outreach Activities in the Yellow River Watershed 2021-2041						
Activity	Target Audience	Cost	Timeline (Years)			Agencies
			0-5	5-10-	11-20	
Project Location Signage	General Public, Agricultural landowners	\$600/sign	2 signs	2 signs	2 signs	LWSP, LCFM
Website	General Public, Agricultural landowners	\$500	Develop	Upkeep	Upkeep	LWSP, LCFM, LWIPA
Facebook Page	General Public, Agricultural landowners	\$500	Develop	Upkeep	Upkeep	LWSP, LCFM, LWIPA
Annual Meeting	Project Participants, Donors, Lake Association, General Public	\$500/year	1 meeting	1 Meeting	1 Meeting	LWSP, LWIPA, LCFM
Public Booths	Event Attendees, Agricultural landowners	\$150/year	2 booths	2 booths	2 booths	LWSP, LCFM, LWIPA
Pamphlet	Donors, Lake Residents, General Public, Agricultural landowners	\$1000	Develop	Update	Update	LWSP, LCFM
Watershed Tour	General Public, Donors, Agricultural landowners	\$1000/tour	1 tour	1 tour	1 tour	LWSP, LCFM
Watershed Curriculum Implementation	Kamp Kenwood Attendees, Local Children	\$2000/year	3 camp seasons	3 camp seasons	3 camp seasons	LWSP, LCFM, WFU
Canoes for a Cause Volunteer Tree Planting Event	General Public, Agricultural landowners	\$1000/year	3 events	3 events	3 events	LWSP, LCFM
Direct Mailings	Potential Project Participants, Agricultural landowners	\$500/Year	4 Watersheds	4 Watersheds	8 Watersheds	LWSP, LCFM
Direct Contacts	Potential Project Participants, Agricultural landowners	\$500/year	4 Watersheds	4 Watersheds	8 Watersheds	LWSP, LCFM

Element 6 - The Schedule for Implementing the Management Measures

EPA guidance requires that a 9-Key Element Plan Provides:

“A schedule for implementing the Agricultural Non-Point source management measures identified in this plan that is reasonably expeditious.”, (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Page 2-15).

6.1 The Existing Schedule for Implementing the Management Measures

The table below shows the current LWSP project goals, components, and partners involved in completing those goals. Experience working with these partners helped to create an accurate implementation schedule into the future.

Table 20 documents the proposed goals and partners involved in implementing management measures in the Lake Wissota Watershed.

<u>Project Component</u>	<u>Goal</u>	<u>Partners Involved</u>
Project Planning/ Coordination/Reporting	-Complete annual work planning and budgeting, apply for grants, and track/evaluate progress	LCFM, LWIPA, Corporate Sponsors
Conservation on the Land	-Install Upland and Lowland conservation practices within priority HUC 12 sub-basins and in critical areas to reduce sediment and phosphorus loads to meet DNR derived reduction goals. Estimate reductions using STEPL modeling	LCFM, NRCS, FSA, DNR, Private Donors
Monitoring	-Continue to facilitate CLMN Lake monitoring in Lake Wissota -Continue to facilitate WAV Stream Monitoring in the Lake Wissota Watershed -Consult with DNR WQ Biologists to assess Yellow River tributaries and Lake Wissota/Moon Bay water quality conditions	DNR, Boy Scouts, Community Volunteers
Community Outreach	-Work with local educational institutions and environment-based non-profits to efficiently and effectively educate watershed residents	Local Educational Institutions, Non-Profits

6.2 The Proposed Schedule for Implementing the Management Measures

Since 2009, an annual work planning process has been conducted every December with the Lake Wissota Stewardship Project team (LWSP). The Project Team is comprised of Chippewa County LCFM and DNR agency personnel, Jacob Leinenkugel Brewing Co. management, Miller-Coors management, and other watershed landowners. The LWSP will assess progress and projects of the current year, compare those accomplishments to plan implementation milestones, and then develop a work plan for the upcoming year. Adjustments to the project implementation strategy will be discussed to meet this plan's phosphorus reduction goals by focusing on priority HUC 12 watersheds, critical areas and landowner/operator interest in adoption of soil and water conservation practices. The results of the planning session are then systematically implemented over the next 12 months. A sample work plan is included below. All work plan items were completed, and a 2021 Lake Wissota Stewardship Project work plan is now in implementation. Work plans during the implantation schedule will be very similar to the work plan shown below within table 29.

The revised goals for the next phase of the project, 2020-2041, are as follows:

- Reduce phosphorus and sediment loading in the watershed with conservation Practices, with a focus upon priority HUC 12 watersheds and critical cropland areas problem feedlots and other sources to achieve the plan's phosphorus reduction and water quality goals for Moon Bay and the Yellow River watershed.

- Continue to facilitate and complete quality lake and stream monitoring efforts within prioritized HUC 12's in the Yellow River watershed; focus monitoring in areas with substantial adoption of practices/landowner participation

- Increase public awareness of the economic and ecological importance of good surface water quality and how good land and water practices affect water quality and public health.

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6.21 Proposed Project Schedule Work Plan

In order to reach this plan's phosphorus and water quality goals in 20 years within the watershed and Moon Bay, the LWSP team will annually review and then replicate the schedule in Table 21 for the prioritized HUC 12 sub-watersheds in this plan.

There are no other proposed changes or refinements from the existing watershed Project Team strategy and approach.

6.22 Proposed Project Schedule and Implementation Measures

Table 22 documents the schedule and implementation milestones to help the LWSP meet this plan’s phosphorus load reductions and water quality goals for Moon Bay and the Yellow River watershed

Table 22

<u>Project Component</u>	<u>Goal</u>	<u>Partners Involved</u>	<u>Due Date</u>
Project Planning/ Coordination/Reporting	-Complete annual work planning and budgeting, apply for grants, and track/evaluate progress	LCFM, LWIPA, Corporate Sponsors	By January 15 th of each year
Conservation on the Land	-Install Upland and Lowland conservation practices, first within priority HUC 12 sub-basins and identified critical cropland areas and feedlots , to reduce sediment and phosphorus loads to levels at amounts defined in STEPL modeling	LCFM, NRCS, FSA, DNR, Private Donors	16,374 Lbs. P by 2025 32,748 Lbs. P by 2030 49,123 Lbs. P by 2040
Monitoring	-Continue to facilitate CLMN Lake monitoring in Lake Wissota -Continue to facilitate WAV Stream Monitoring in the Lake Wissota Watershed -Include DNR WQ biologists, as necessary to assist with monitoring efforts	DNR, Boy Scouts, Community Volunteers	MOUs by March of Each Year, all DNR CLMN/WAV Monitoring dates sampled by volunteers
Community Outreach	-Work with local educational institutions and environment-based non-profits to efficiently and effectively educate community members of all ages	Local Educational Institutions, Non-Profits	Fulfill yearly community outreach goals by December 31 st of each year

Table 23 documents some interim conservation practice milestones and watershed partners to achieve the Yellow River/Moon Bay watershed pollutant reduction and water quality goals.

In order to reach this plan’s phosphorus reduction and water quality goals in 20 years, the LWSP will need to annually review table 31 and 32 milestones, and then assess, track and verify cropland and feedlot conservation projects are completed and maintained in the watershed.

Table 23

Lake Wissota Stewardship Project BMP Installation Activities in the Yellow River Watershed (2021-2041)						
HUC 12 Implementation Priority: (1) Lotz (2) Big Drywood (3) Little Drywood (4) Pike (5) Otter (6) Lake Wissota						
Activity	Measured in	Funding Sources	Timeline (Years) (Acres Installed)			Agencies
			0-5	5-10	11-20	
Nutrient Management Plans	# of acres covered under a Nutrient Management Plan	CREP, DNR, USDA, EQUIP, TRM, SWRM	W1-1531 W2-1531 W3-1531 W4-1531 W5-1531 W6-1531	W1-1531 W2-1531 W3-1531 W4-1531 W5-1531 W6-1531	W1-3062 W2-3062 W3-3062 W4-3062 W5-3062 W6-3062	LWSP, LCFM, NRCS, DATCP, FSA, DNR
Buffer Plantings	# of acres of vegetated stream buffers, wetland scrapes, edge of field filter strips	CREP, DNR, USDA, EQUIP, TRM, SWRM	W1-1531 W2-1531 W3-1531 W4-1531 W5-1531 W6-1531	W1-1531 W2-1531 W3-1531 W4-1531 W5-1531 W6-1531	W1-3062 W2-3062 W3-3062 W4-3062 W5-3062 W6-3062	LWSP, LCFM, NRCS, DATCP, FSA, DNR
Cropping Practices - Soft	# of acres of reduced tillage, cover crops, high residue	CREP, DNR, USDA, EQUIP,	W1-1531 W2-1531	W1-1531 W2-1531	W1-3062 W2-3062	LWSP, LCFM, NRCS, DATCP,

	and/or contour farming	TRM, SWRM	W3-1531 W4-1531 W5-1531 W6-1531	W3-1531 W4-1531 W5-1531 W6-1531	W3-3062 W4-3062 W5-3062 W6-3062	FSA, DNR
Cropping Practices - Hard	# of Grassed Waterways, WASCOB's	CREP, DNR, USDA EQUIP, TRM, SWRM	W1-8 W2-8 W3-8 W4-8 W5-8 W6-8	W1-15 W2-15 W3-15 W4-15 W5-15 W6-15	W1-10 W2-10 W3-10 W4-10 W5-10 W6-10	LWSP, LCFM, NRCS, DATCP, FSA, DNR
Barnyard Practices	# of Feedlots with waste collection & mgmt. BMPs	CREP, DNR, USDA EQUIP, TRM, SWRM	See table below	See table below	See table below	LWSP, LCFM, NRCS, DATCP, FSA, DNR

Schedule and Implementation Levels for Feedlot Practices

Scenario	Interim Milestone – Number Feedlots Needing BMPs			
	Year 1-5	Year 6-10	Year 11-15	Year 16-20
1 - 5 feedlots	1	2	1	1
2 - 25 feedlots	5	7	8	5
3 - 50 feedlots	10	15	15	10
4- 73 feedlots	10	25	28	10

Note: Feedlot BMPs will be prioritized based upon HUC 12 ranked watersheds in plan

6.24 Project Implementation Evaluation

An annual work planning process by the LWSP will assesses the progress and projects of the current year and review a work plan for the upcoming year. Adjustments to the project milestones will be discussed and the results of the planning session will be systematically implemented. This work planning session will happen on a yearly basis. Adjustments to the plan's implementation schedule and interim milestones will be made by the LWSP in 2026, 2031, 2036, and 2041 to reflect the actual extent of cropland and feedlot conservation practices implemented in the watershed and also water quality monitoring results from Yellow River stream tributaries and Lake Wissota.

Element 7 - The Interim, Measurable Milestones for Implementation Success

EPA guidance requires that a 9-Key Element Plan Provides:

“A description of interim measurable milestones for determining whether Agricultural Non-Point source management measures or other control actions are being implemented.”, (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Page 2-15).

7.1 The Measurable Milestones for Implementation Success

The Lake Wissota Stewardship Project team (LWSP) evaluates progress of its four (4) main elements using both administrative monitoring and environmental monitoring. Administrative monitoring will be outlined in this element. Environmental monitoring will be outlined in Element 9.

The LWSP will implement annual administrative monitoring to meet plan objectives by evaluating if activities outlined in the LWSP annual work plan and budget are met or not met. Details of the annual performance will be document in an “Annual performance report”. The 2018-2021 LWSP Work Plans, Budgets, and Annual Performance reports are included in the appendix of this plan.

Administrative implementation tracking will be completed for the following project components:

- 1) Administrative
- 2) Conservation on the Land Monitoring
- 3) Environmental Monitoring
- 4) Community Outreach Monitoring

The LWSP will evaluate if it is achieving program activities as established in the annual work plans for program implementation.

7.11 Administrative Tracking:

Administrative tracking of plan implementation and measurable milestones by the LWSP will be documented in the annual report evaluation of activities as planned under community outreach, monitoring, and conservation on the land.

The LWSP will monitor interim changes in each HUC 12 sub-basin at 5-year or more frequent intervals by:

- 1) Monitoring/evaluating land use and land cover changes
- 2) Recording the location of cropland and feedlot BMPs and verifying implementation
- 3) Monitoring agricultural trends in the watershed (e.g., numbers of cash grain or large animal feeding operations, working with DNR to use satellite imagery to estimate crop residue levels)
- 4) Implementation and Compliance with NR151 Performance Standards and Prohibitions

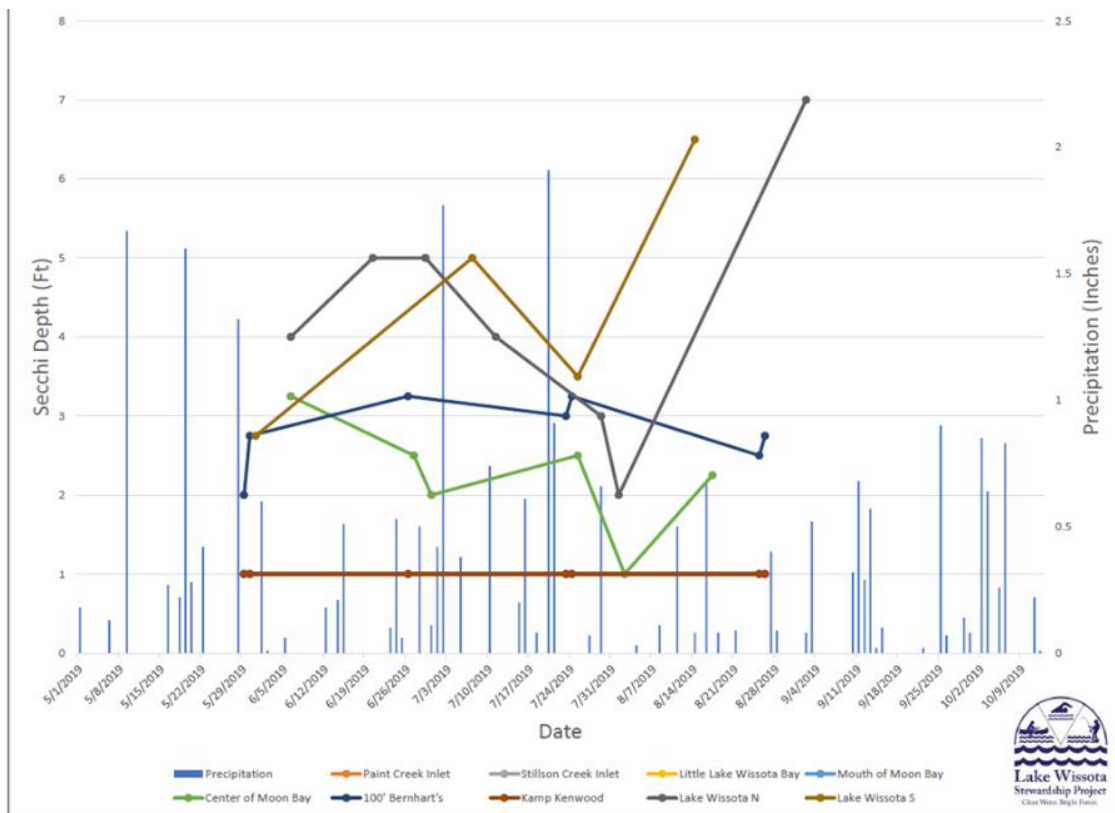
7.12 Environmental Monitoring

The monitoring component, as outlined in element 9, is tracked in the Wisconsin DNR CLMN water quality database and internally in an Excel Spreadsheet developed by the LWSP team. The internal spreadsheet ensures the LWSP team can see trends, visualize the data and make amendments to this plan milestones, over time.

Interim success of the environmental monitoring component will be based upon if planned lake and stream monitoring activities are being annual implemented as outlined in the annual work plan.

Figure 24 documents the Secchi Disk monitoring results from 2020 on Moon Bay.

Figure 24



7.13 Community Outreach Monitoring

The education and outreach component for this plan will be tracked by the LWSP team with a yearly assessment of outreach activities.

Interim success of the community outreach component will be based upon if planned community outreach activities are being annual implemented as outlined in the annual work plan.

7.14 Conservation on the Land Monitoring

The conservation on the land component is currently tracked through CREP Environmental Benefit summaries, and a project tracking sheet. The project tracking sheet is where the LWSP team will record results for each conservation practice from the Environmental Benefit Sheets. Phosphorus and sediment BMPs and reductions will be tracked on a project-by-project basis..

Table 24 documents the Lake Wissota Stewardship Project – Master Monitoring Database (First page only).

Table 24

Little Lake Wissota Stewardship Project - Master Monitoring Database (6/12/2017)										
Landowner	Location	SB	WT	# of Acres	# of Trees	Easement	Year	Phosphorus Reduction (lbs.)	Sediment Reduction (tons)	Groundwater Infiltration (gal.)
G. Krumenauer	T28N R6W Sect. 26	✓		9.0	2700	Y	2009	15.0	7.2	
G. Krumenauer	T28N R6W Sect. 26		✓	8.8		Y	2009	10.0	6.6	1,300,000
2009 Totals				17.8	2700			25.0	13.8	1,300,000
R. Schafer	T28N R6W Sect. 23	✓		6.5	2500	Y	2010	12.3	5.0	
R. Schafer	T28N R6W Sect. 23		✓	3.7		Y	2010	3.1	0.5	2,433,935
2010 Totals				10.2	2500			15.4	5.5	2,433,935
S. Olson	T28N R6W Sect. 22	✓		10.1	7800	Y	2011	28.3	8.8	
M. Gilles	T28N R6W Sect. 11	✓		4.4	1500	Y	2011	30.0	12.4	
M. Gilles	T28N R6W Sect. 11		✓	17.9		Y	2011	34.0	18.9	4,678,301
P. Snyder	T28N R6W Sect. 23	✓		2.2	1100		2011	23.3	10.0	
D. Mayer	T28N R7W Sect. 30	✓		2.9			2011	16.0	6.0	
2011 Totals				37.5	10400			151.6	56.1	4,678,301
J. Mower	T28N R6W Sect. 26	✓		5.5	2750	Y	2012	30.6	13.0	
C. Chapek	T28N R6W Sect. 24	✓	✓	3.7	250	Y	2012	1.1	0.1	287,827
W. Dohms	T28N R6W Sect. 10		✓				2012	6.5	2.2	889,050
J. Jones	T28N R7W Sect. 22		✓				2012	1.0	0.1	259,887
Wm Brick	T28N R6W Sect. 36	✓		6.9	500	Y	2012	2.4	0.3	814,813
J. Boyesa	T28N R7W Sect. 35	✓		5.2		Y	2012	4.8	1.5	1,148,152
E. Goettl	T28N R6W Sect. 25		✓				2012	3.5	1.5	301,501
J. Bachman	T28N R7W Sect. 30	✓		1.8		Y	2012	1.6	0.6	988,481
J. Peck	T28N R7W Sect. 21	✓					2012	2.8	1.2	377,421
T. Weiss	T28N R7W Sect. 36	✓		11.1		Y	2012	5.5	1.6	841,025
2012 Totals				34.2	3500			59.8	22.1	5,853,107
C. Evjen	T28N R7W Sect. 14		✓				2013	1.8	0.3	653,406
J. Melville	T28N R7W Sect. 28	✓		3.3		Y	2013	1.6	1.2	1,812,268
K. Lancellotti	T28N R7W Sect. 29	✓		2.6	500	Y	2013	1.6	1.2	983,144
J. Kries	T28N R7W Sect. 16	✓		6.0		Y	2013	2.2	1.0	404,102
B. Oberle	T28N R6W Sect. 21	✓		0.9		Y	2013	6.3	2.2	2,759,248
S. Ramszler	T28N R6W Sect. 17	✓		1.5		Y	2013	2.5	1.5	1,271,846
2013 Totals				14.3	500			16.0	7.4	7,884,014

Figure 25 documents the approximate lbs. of P reduction needed to achieve the plan’s phosphorus reduction and water quality goals in twenty (20) years, compared to the amount of reduction required per year to reach the goal.

Figure 25

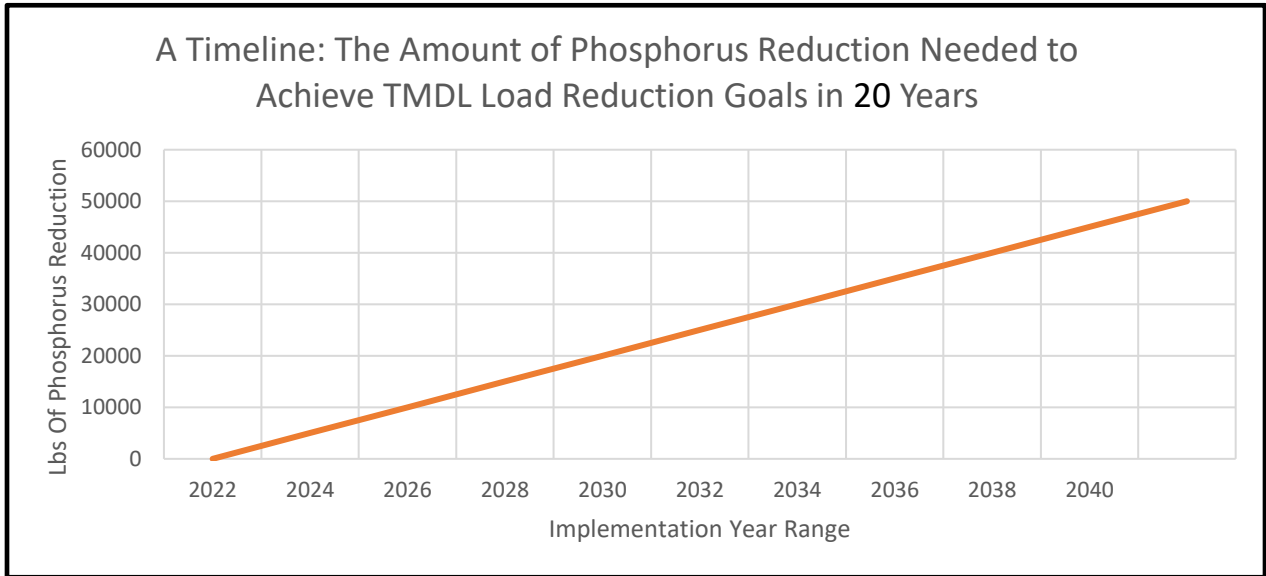
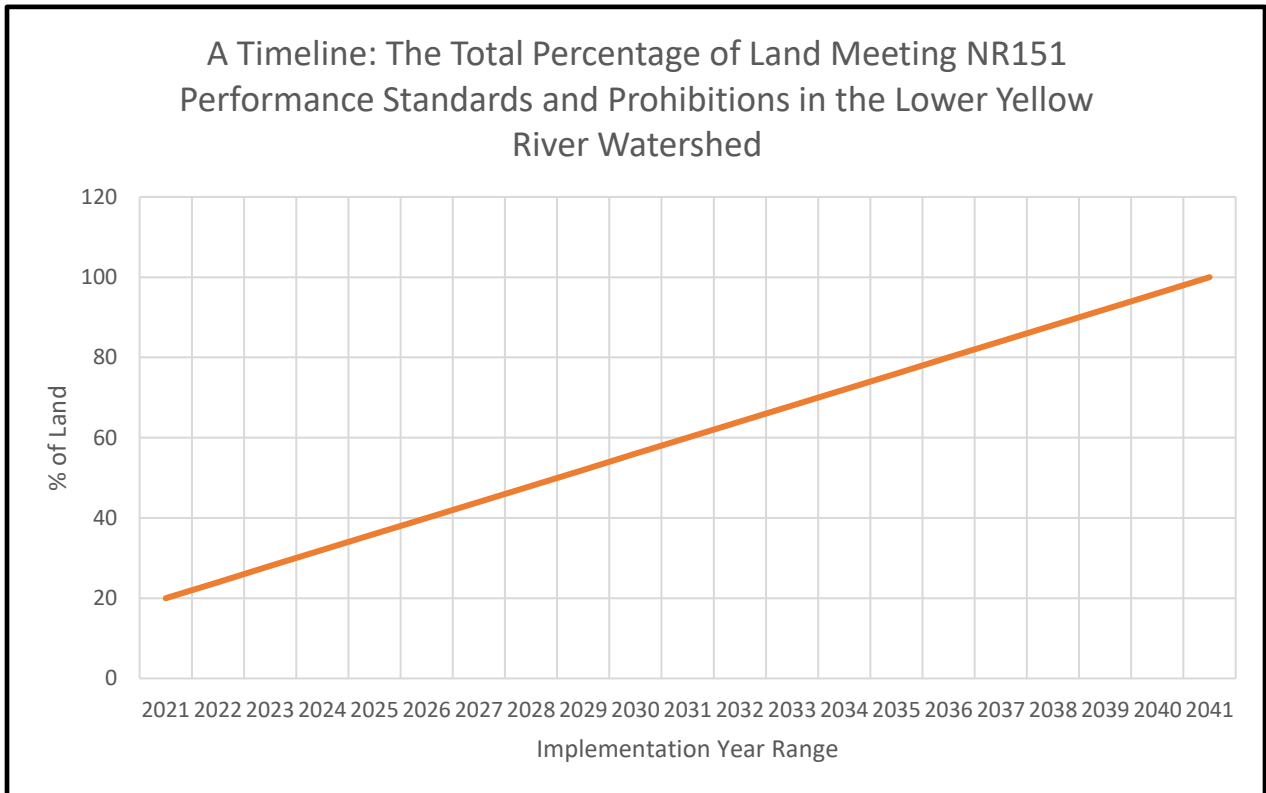


Figure 26 documents the timeline needed to reach NR151 Performance standards



Element 8 - The Criteria to Determine if Load Reductions Are Being Achieved

EPA guidance requires that a 9-Key Element Plan Provides:

“A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.”, (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Page 2-15).

8.1.1 The Agricultural Non-Point Source Criteria to Determine if Load Reductions are being Achieved

The Lake Wissota Stewardship Project (LWSP) will determine if this plan’s load reductions are being achieved by:

- 1) Monitoring water quality in Moon Bay and on streams in the Yellow River watershed
- 2) Monitoring the number offarm operations (cropland and/or feedlots) evaluated to meet NR151 agricultural standards and the extent of compliance with NR151
- 3) Monitoring land use, land cover and crop residue/tillage levels used to generate modeled pollutant loads
- 4) Monitor Feedlots and runoff collection/control BMPs to confirm no discharge/runoff to surface waters
- 5) Monitor conservation on the land locations and pollutant loads

The LWSP will remodel pollutant loads every 5 years (2026, 2031, 2036, 2041) to assess if load reduction goals are being met.

When the Little Lake Wissota Stewardship Project model was developed, it was immediately obvious that quantifying the load reductions from individual conservation projects and comparing it against TMDL goals or equivalent water quality-based reduction goals was crucial.

Streambank buffer and wetland restoration pollution reductions were estimated using the USDA/DATCP CREP Environmental Benefit Report Summary.

Infiltration estimates were calculated using the Soil Survey of Chippewa County, Wisconsin, (1989) and USDA TR-55 Urban Hydrology for Small Watersheds.

The Lake Wissota Stewardship Project “Master Monitoring Database” will help track best management practices, number of cropland acres, numbers of feedlots with runoff control BMPs, year installed, and pollution reduction for phosphorus and sediment throughout the Lower Yellow River watershed.

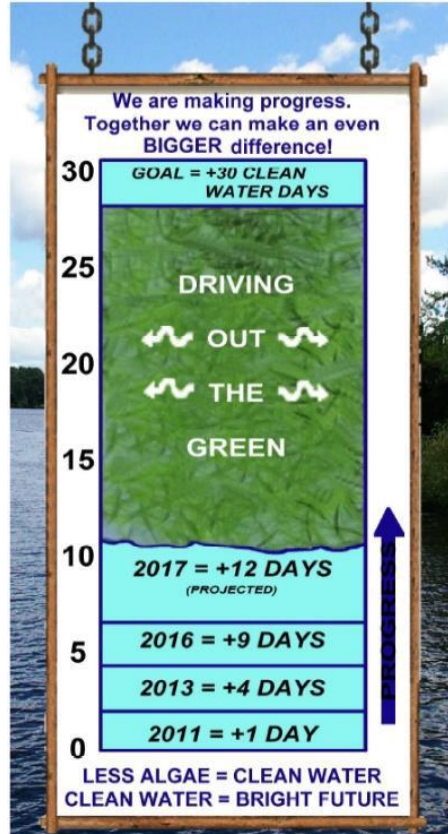
Table 25 documents an excerpt of the Lake Wissota Stewardship Project Master Monitoring Database. This database tracks project environmental impacts on a project-by-project and year-by-year basis.

Little Lake Wissota Stewardship Project - Master Monitoring Database (6/12/2017)										
Landowner	Location	DB	WT	# of Acres	# of Trees	Excesses	Year	Phosphorus Reduction (lbs.)	Sediment Reduction (tons)	Groundwater Infiltration (gal.)
G. Krummhauser	720N RW Sect. 20	✓		8.8	2700	Y	2009	15.0	7.2	1,300,000
G. Krummhauser	720N RW Sect. 20	✓		8.8		Y	2009	10.0	6.6	1,300,000
2009 Totals				17.6	2700			25.0	13.8	1,300,000
B. Schafer	720N RW Sect. 23	✓		6.5	2500	Y	2010	12.1	5.0	
B. Schafer	720N RW Sect. 23	✓		3.7		Y	2010	3.1	0.5	2,433,935
2010 Totals				10.2	2500			15.4	5.5	2,433,935
S. Olson	720N RW Sect. 22	✓		10.1	7800	Y	2011	28.3	8.8	
M. Gillet	720N RW Sect. 11	✓		4.4	1500	Y	2011	30.0	12.4	
M. Gillet	720N RW Sect. 11	✓		17.9		Y	2011	54.0	18.9	4,678,301
P. Snyder	720N RW Sect. 23	✓		2.2	1100		2011	23.3	10.0	
D. Mayer	720N RW Sect. 20	✓		2.8			2011	16.0	6.0	
2011 Totals				37.5	10400			151.6	56.1	4,678,301
L. Mower	720N RW Sect. 26	✓		5.5	2750	Y	2012	30.6	13.0	
E. Chapak	720N RW Sect. 14	✓		3.7	250	Y	2012	1.1	0.1	287,817
W. Dehnis	720N RW Sect. 10	✓					2012	6.5	2.2	889,050
J. James	720N RW Sect. 22	✓					2012	1.0	0.1	259,887
Wm Brick	720N RW Sect. 36	✓		6.9	500	Y	2012	2.4	0.9	814,833
J. Boyea	720N RW Sect. 35	✓		5.2		Y	2012	4.8	1.5	1,148,152
J. Goettl	720N RW Sect. 29	✓					2012	3.5	1.5	301,501
B. Bachman	720N RW Sect. 30	✓		1.8		Y	2012	1.6	0.6	913,491
J. Peck	720N RW Sect. 21	✓					2012	2.8	1.2	377,421
T. Weiss	720N RW Sect. 36	✓		11.1		Y	2012	5.5	1.8	841,025
2012 Totals				54.2	3600			99.8	32.1	5,851,107
C. Eujen	720N RW Sect. 14	✓					2013	1.8	0.3	653,406
L. Morville	720N RW Sect. 28	✓		1.3		Y	2013	1.6	1.2	1,812,208
K. Landrine	720N RW Sect. 29	✓		2.0	500	Y	2013	1.6	1.2	983,144
J. Kriss	720N RW Sect. 16	✓		6.0		Y	2013	2.2	1.0	404,102
B. Oberle	720N RW Sect. 21	✓		0.9		Y	2013	6.3	2.2	2,759,248
B. Runymer	720N RW Sect. 17	✓		1.5		Y	2013	2.5	1.5	1,271,646
2013 Totals				14.1	500			16.0	7.4	7,884,014

Results of the Master Monitoring Database were analyzed to be accurate, if not low, by an independent, site specific study conducted by a private lake consulting firm in 2015.

The Lake Wissota Stewardship Project also tracks and communicates its progress in “Clean Water Days.” Clean water days are a way to communicate the pollutant load reductions achieved through the project to the public.

Figure 27 shows the “Driving Out the Green” graphic used to demonstrate gains in “Clean Water Days” through projects installed by the Lake Wissota Stewardship Project.



“Clean Water Days” were calculated by Wisconsin DNR by relating the associated chlorophyll response from nutrient loading to the lake. Clean Water Days apply to times when water quality is not limited by algae growth, generally from June-September. For this plan, clean water days will be defined as days when chlorophyll-a concentrations are less than 20ug/L.

A Driving out the green graphic and measurement method will be developed with DNR and LCFM based on desired chlorophyll concentrations described in a 2018 DNR Memo related to Moon Bay and Yellow River Watershed.

“Clean Water Days” are calculated for the Yellow River Watershed and Moon Bay with the following assumptions:

- There are 30 days per year that Moon Bay is unsafe to swim in due to algae blooms – between June 1 and September 30 summertime period
- 3,000 lbs. of phosphorus, as outlined in the DNR Memo, need to be reduced.
- 3,000 lbs. reduction and 30 unsafe days divide to 100 lbs. of phosphorus input per unsafe day.
- One” Clean Water Day” = 100 lbs. of phosphorus reduction from the Master Monitoring Database.

The Lake Wissota Stewardship Project will work with WDNR in 2021 to develop clean water day estimations for Moon Bay of Lake Wissota based on Chlorophyll concentration goals outlined in the 2018 DNR Memo. This memo predicts a 54% TP reductions in the watershed will result in 30% or less of summer days when chlorophyll-a concentrations are > 20 ug/L.

The LWSP will continue to apply CREP modeling evaluation criteria as required by USDA. We recognize that this will be to illustrate pollution load reductions to the public but will not tie back to STEPL modeled load reductions.

Water quality monitoring – for total phosphorus and chlorophyll-A within Moon Bay and total phosphorus within streams leading to the lake (see section 9 of plan) will help confirm if estimated phosphorus reductions from practices implemented in the watershed are occurring over this plan’s twenty year schedule. . Monitoring will be focused within high priority HUC 12 sub-basins first, and then lower priority HUC 12 sub-basins in the watershed second. Monitoring will be completed in consultation with DNR and will be completed based upon the extent and types of BMP adoption within priority Yellow River HUC 12 sub-basins..

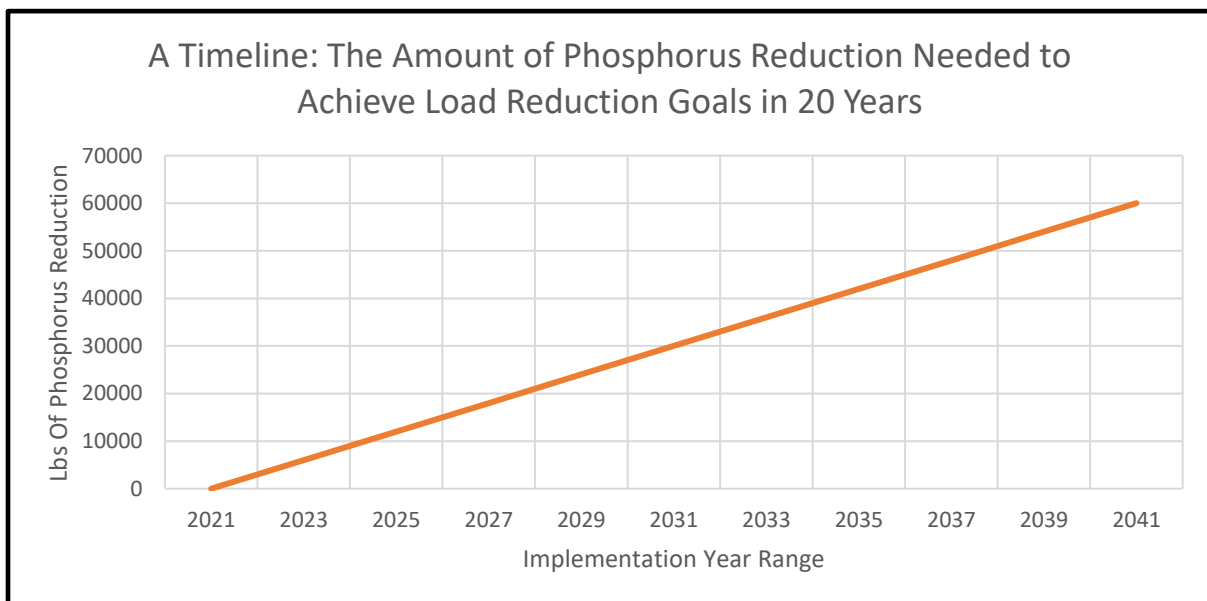
In order to strengthen the set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made towards attaining this plan’s phosphorus and water quality goals, the LWSP team will complete an annual review of BMP implementation and progress within this plan’s high priority HUC 12 sub-basins first, and then remaining lower priority HUC 12 sub-basins. The LWSP team will also develop evaluate plan implementation using the plan’s outreach and education milestones for the same HUC 12 sub-basins.

In early 2018, the LWSP team set goals for the amount of phosphorus, sediment, and

water infiltration changes to expect in the next 10 years in both the Yellow River Sub watersheds and the Little Lake Wissota Watershed. These yearly benchmarks will serve as a clear and concise way for the LWSP team to evaluate plan implementation and performance. These goals are shown in the table below.

Since 2019, the LWSP has been working with WI DNR to establish a total phosphorus stream monitoring program within the Lower Yellow River watershed and Moon Bay. The DNR has indicated it supports using stream and lake monitoring (i.e., total phosphorus and chlorophyll concentration results), to measure changes in pollutant loads over this plan’s 20-year schedule. The DNR, as staff and budget resources allow, will plan and help complete this monitoring work.

The LWSP will also rerun the STEPL Model in 2025, 2031, 2035 and 2041 with updated data sets and implementation records re-assess pollution reduction for priority and then remaining HUC 12 sub-basins in the Yellow River watershed.



The proposed implementation schedule for this plan and the Lake Wissota Stewardship Project will be twenty (20) years. Over this time span, individual farms (cropland and/or feedlots), within the prioritized HUC 12 watersheds, will be assessed to determine the location and efficiency of existing BMPs, critical areas for causing nonpoint source pollution and opportunities for adopting the agricultural practices described in this plan. Farm operations in the watershed will also be assessed by Chippewa County and the DNR to determine whether they are in compliance with the State of Wisconsin’s agriculture performance standards, in accordance with the Department of Natural Resources, Chapter NR 151.

All BMPs that are contracted under the Lake Wissota Stewardship Project will be planned, designed, and installed by certified staff with the appropriate training. This rule ensures

that qualified staff are involved in the decision-making process and insures that selected BMPs and their application is appropriate for the existing conditions. When a farm operator has agreed to the installation of a BMP, they will be required to sign a cost-share assistance agreement, an operations and management agreement, and have their farm evaluated for the NR151 standards. This ensures that the farm operator understands their responsibility for the proper and continued operation of the BMP.

As the Lake Wissota Stewardship Project progresses, it will be important to monitor the functionality of all BMPs periodically after their installation and over the plan's twenty-year schedule. Over time, BMPs can become less efficient at achieving designed pollutant reductions due to several factors. According to the U.S. Environmental Protection Agency Technical memo #1 , natural variability, lack of proper maintenance, and unforeseen consequences are primary causes of BMP depreciation. https://www.epa.gov/sites/production/files/2015-10/documents/tech_memo_1_oct15.pdf

There are several key implementation milestones in this plan that will require careful tracking and monitoring to determine how much progress is being made and if plan milestones are being achieved within the Yellow River HUC 12 sub-basins. Those milestones include:

- The number and types of conservation practices installed in high priority HUC 12s to address critical areas within a HUC 12 and whether the extent of conservation practices measures are or are not meeting plan milestones by Year 5.
- The number and types of conservation measures installed in lower priority HUC 12s and whether the extent of conservation practices are or are not meeting plan milestones by Year 10
- In-stream and/or Moon Bay water quality monitoring within HUC 12s that meet or are close to meeting this plan's 5 and 10 year practice milestones to confirm if a stream or lake shows a positive water quality response after adoption of conservation measures by Years 7 and 15.

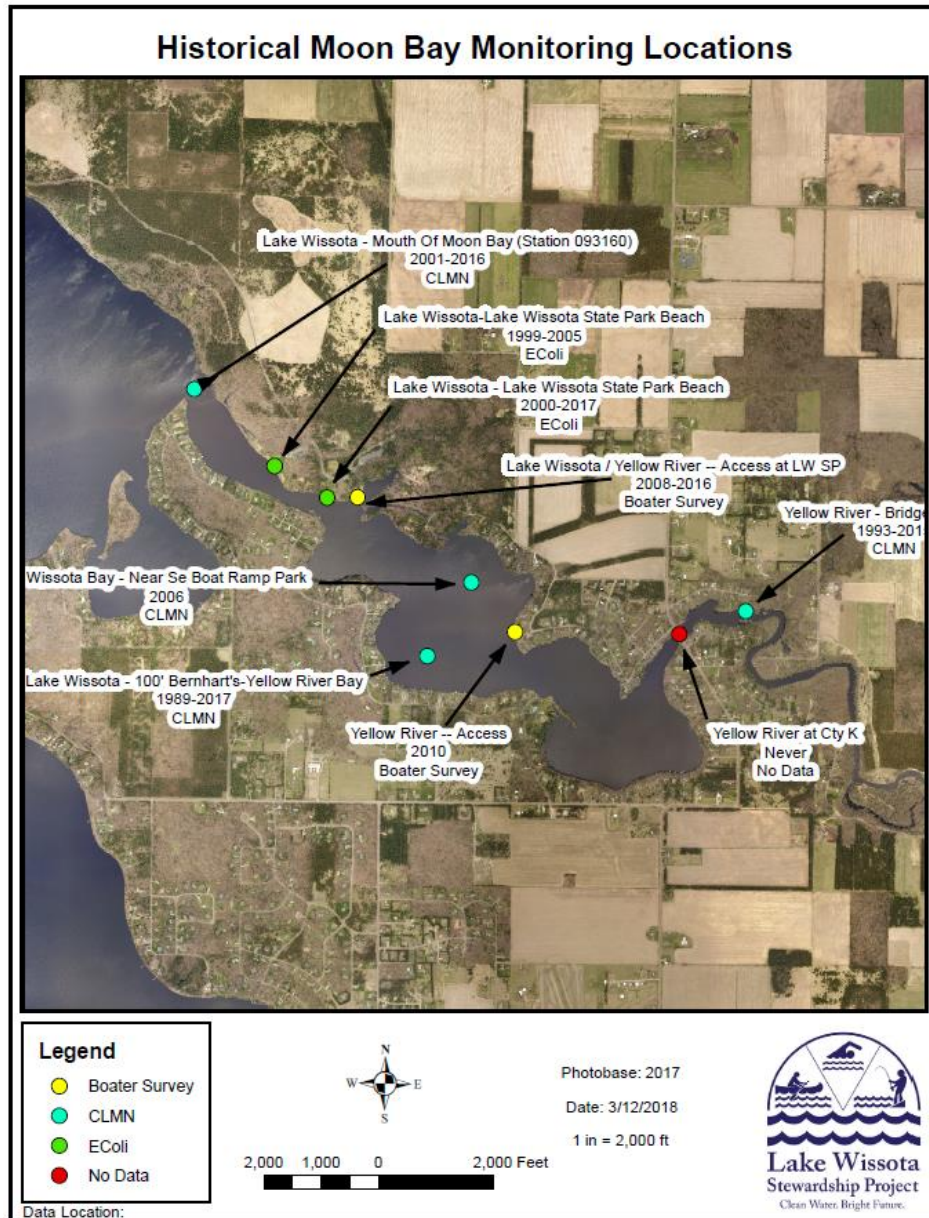
The Lake Wissota Stewardship Project team will take the lead responsibility of monitoring plan implementation progress by tracking the following plan components and periodically reviewing and using some of the BMP depreciation methods described within EPA technical memo #1:

1. Information and education activities and participation.
2. Number and extent of installed BMPs in HUC 12 sub-basins and corresponding pollution reduction levels
3. BMP maintenance and depreciation
- 4.. Administrative review.

Those sites to be sampled and monitored, under agreement by the participating troop under this project, are shown on the following map.

Map 15 shows locations of historical monitoring sites on Moon Bay. Sites monitored from 2018 to present are the Mouth of Moon Bay, Wissota Bay Near Boat Ramp, 100' Berhart's, and a new monitoring site in the bay south of the Yellow River at Cty K station.

Map 15



All sites are monitored two (2) times per month beginning approximately April 15 and ending approximately September 15.

Secchi disk and temperature readings are taken at each site during every monitoring event.

Water quality samples for total phosphorus and chlorophyll are taken four (4) times throughout the summer months (June, July, August, and September?) approximately 30 days apart. Total phosphorus and chlorophyll samples are taken at the time that Secchi disk and temperature readings are made. Water quality samples are processed and submitted to the State Lab of Hygiene following prescribed procedures.

The data collected is entered into the Wisconsin Department of Natural Resources Citizen Lake Monitoring Network database.

Figure 29 shows a Wisconsin DNR staff member teaching CLMN methods to local community volunteers in the Winter of 2018.

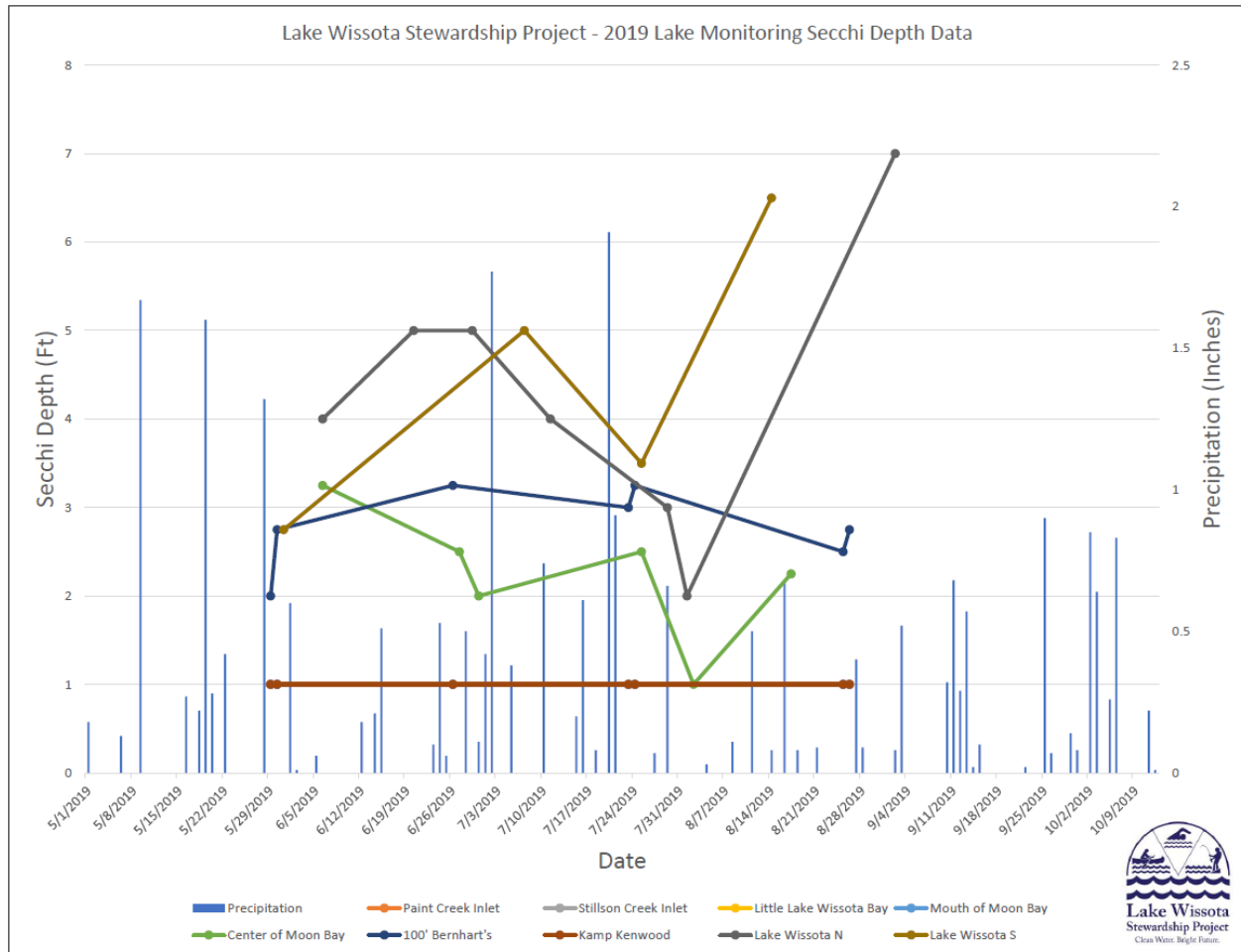
Figure 29



As in the past, The Department of Land Conservation & Forest Management will continue to pursue volunteers to monitor Lake Wissota through the DNR Citizen Lake Monitoring Network program.

Figure 30 shows the 2018 Lake Wissota Secchi data collected by local Boy Scout Troops and community volunteers. Precipitation added to X-axis to put data in context.

Figure 30



Note: Data in the above graph is from 2019. 2020 CLMN data is not yet on the DNR Surface Water Data Viewer at the time that this plan is being written. Updated surface water data can be found here: <https://dnr.wisconsin.gov/topic/SurfaceWater/swdv>

Table 26 – Secchi Disk Interim Milestones

Secchi Disk Interim Milestones			
Current Secchi (Average Depth)	Year 5	Year 10	Year 20
3ft	4ft	5ft	6ft

The CLMN program does not allow volunteers to take chlorophyll samples before they take secchi data for 2 years. One site has taken chlorophyll samples since 2005. The below table shows the data set since 2005.

Figure 31 Shows Chlorophyll A Results as taken on Moon Bay at the 100' Bernharts Station

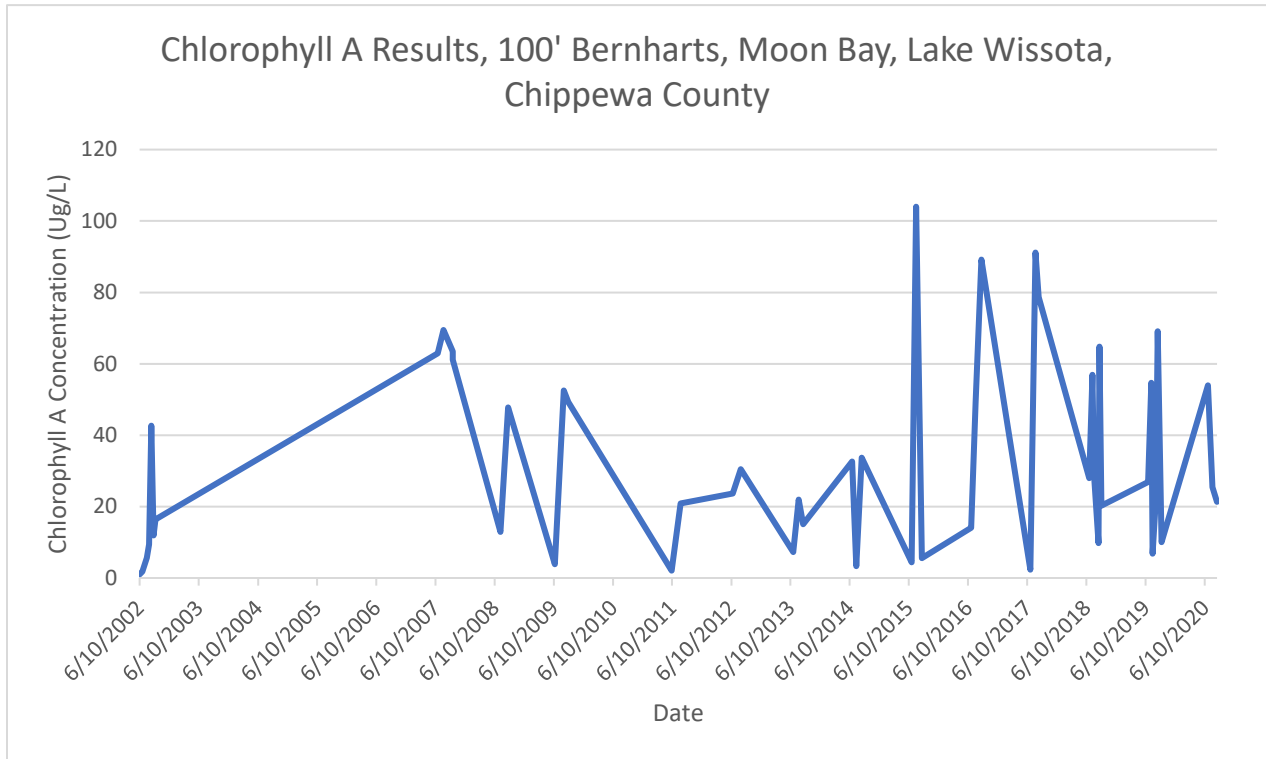


Table 27 – Chlorophyll A Interim Milestones

Chlorophyll A Interim Milestones			
Chlorophyll-A	Year 5	Year 10	Year 20
30 ug/L (2019)	27 ug/L	24 ug/L	19 Ug/L (20 ug/L Basin Goal)

9.12 Stream Monitoring

The Lake Wissota Stewardship Project Team has also been working with Wisconsin DNR staff since the early parts of 2018 to initiate and complete Targeted Watershed Assessment (TWA) for total phosphorus and biological sampling in the Lower Yellow River watershed. The TWA design involves monitoring at the HUC 12 scale, with approximately five to six sites sampled per watershed (HUC 12), at which chemistry, macroinvertebrates, fish, habitat, and flows/water level data are collected. These core indicators will be supplemented by pour point water chemistry grab samples during the growing season (May through October) from 2019-2021 for Total Phosphorus (TP). Such monitoring, when complete, will form a baseline data set that can be used to compare with future monitoring results, over this plan's 20-year schedule.

Additional background information on TWA methods and results from completed TWAs can be found here:

<https://dnr.wisconsin.gov/topic/SurfaceWater/wqmplan>

<https://dnr.wi.gov/topic/surfaceWater/monitoring/strategy/Appendix%20G%20Wisconsins%20Targeted%20Watershed%20Approach.pdf> .

The locations for existing water sampling stations in the Yellow River Watershed are described below. Samples are collected by volunteers and sent to the State Lab of Hygiene for analysis of water chemistry parameters. Locations are shown on the following map.

If WDNR is not able to fund/conduct TP monitoring after completing the TWA in 2021, the LWSP will apply for grant funding to continue TP monitoring in the Yellow River Watershed to monitor trends in water quality and to evaluate environmental impacts from adoption of BMPs in selected HUC 12 watersheds, over time.

Map 20 shows the phosphorus and biological monitoring locations for the 2019-2021 in the Yellow River Watershed.

Map 16 – LWSP Stream Monitoring Locations

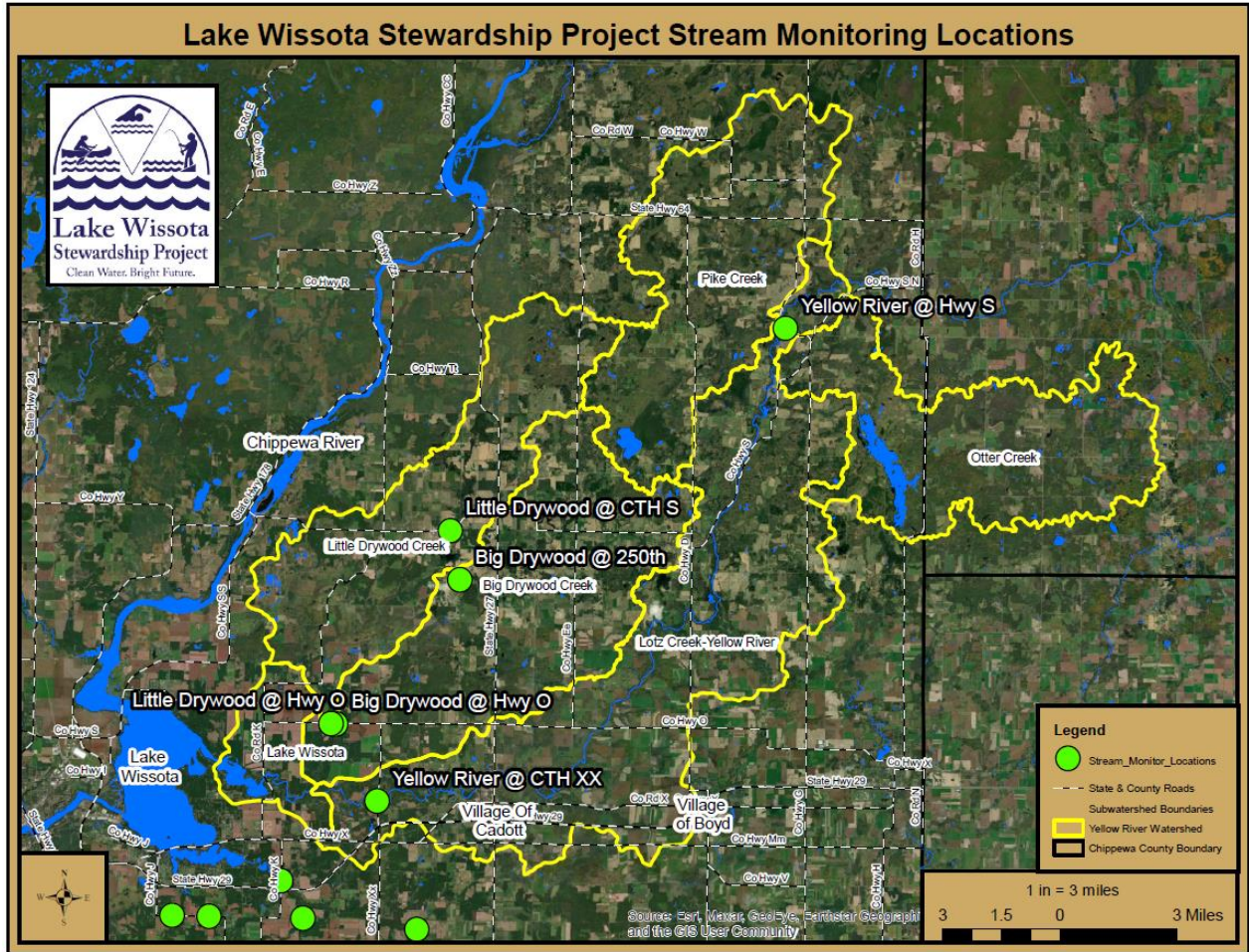
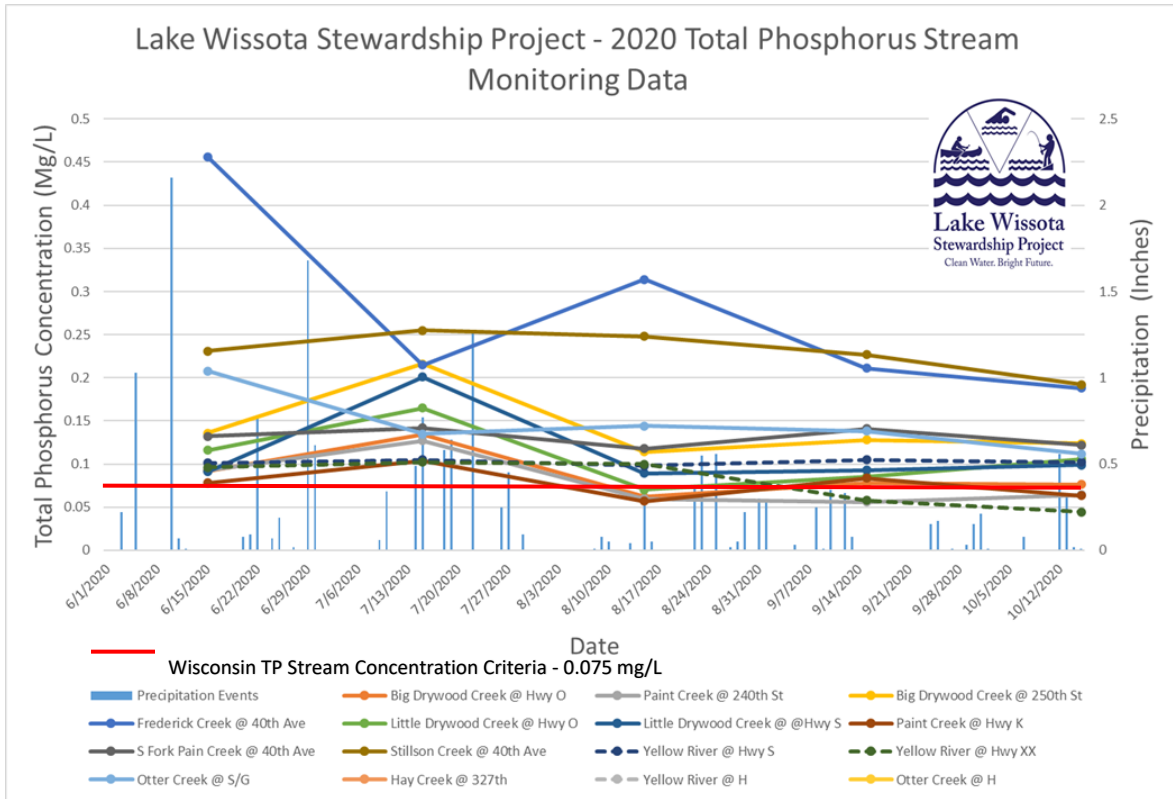


Figure 32 shows the 2020 LWSP total phosphorus data. Precipitation added to X-axis to put data in context. General trends from this data set show that most streams were above Phosphorus standards in 202 and, when compared, are similar to results from Little Lake Wissota results immediately adjacent to the Yellow River Watershed.

Figure 32



Current surface water data can be found here:

<https://dnr.wisconsin.gov/topic/SurfaceWater/swdv>

Detailed water quality reports for all stream monitoring sites in the Yellow River Watershed can be found in Appendix 6.

Table 28 – Table showing interim milestones for TP stream monitoring values

	Current TP (mg/L)	Target TP (mg/L)	Year 5	Year 10	Year 11-20
Site 1 – Yellow River at CTH XX	Average Determined in Oct 2022	.075	TBD	TBD	.075
Site 2 – Little Drywood @ Hwy O	Average Determined in Oct 2022	.075	TBD	TBD	.075
Site 3 - Big Drywood @ Hwy O	Average Determined in Oct 2022	.075	TBD	TBD	.075
Site 4 - Big Drywood @ 250th	Average Determined in Oct 2022	.075	TBD	TBD	.075
Site 5 - Little Drywood @ CTH S	Average Determined in Oct 2022	.075	TBD	TBD	.075
Site 6 Yellow River at HWY S	Average Determined in Oct 2022	.075	TBD	TBD	.075

*= All TP values are expressed as median of samples taken between May-Oct months

TBD= To Be Determined. Stream TP sampling results can vary over time based upon climate, stream flow, and type/extent of practices implemented and maintained upgradient of sampling site(s). Evaluating stream TP concentrations will require looking at multiple years of sampling results for trends/patterns of increasing or decreasing TP levels within the streams.

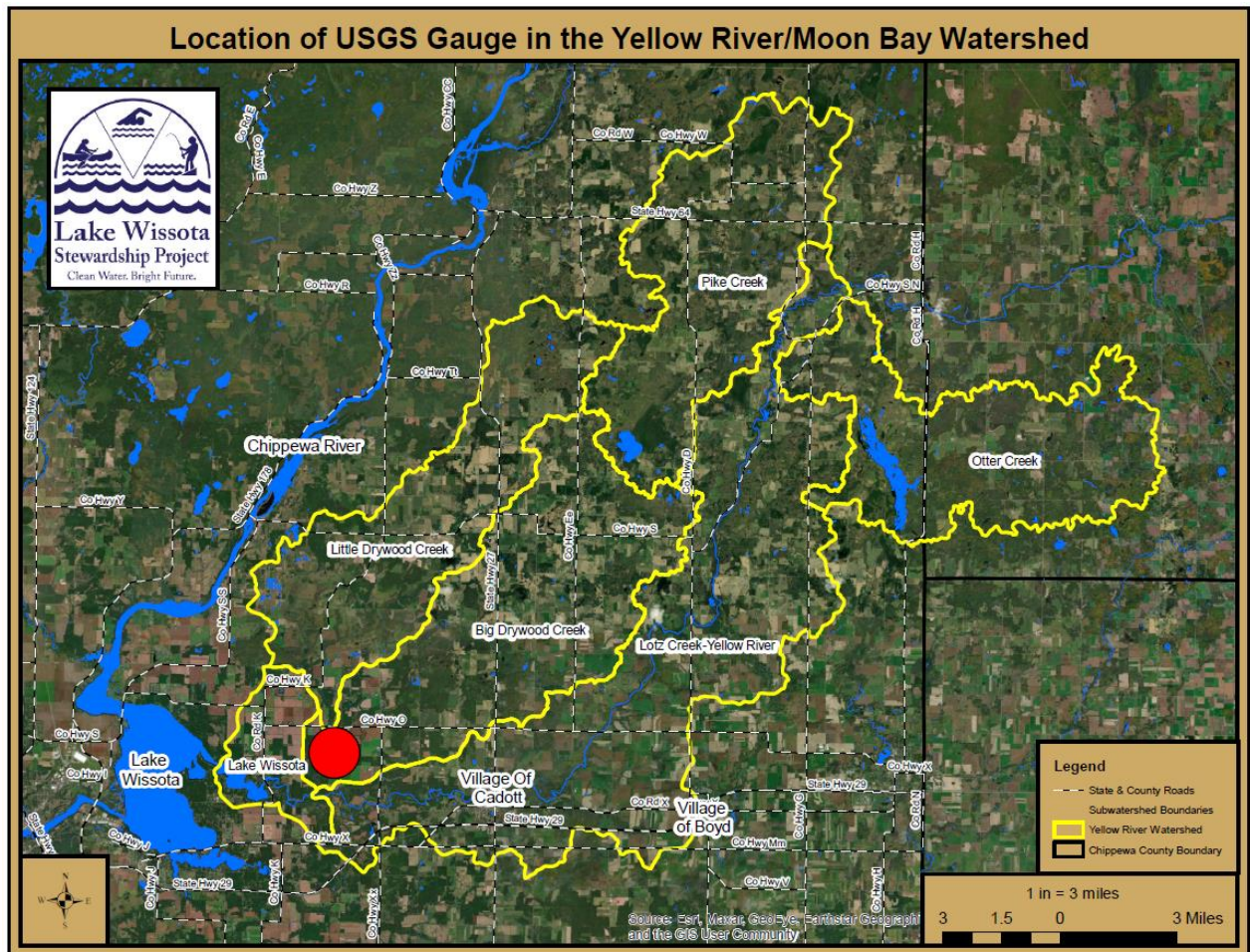
9.13 USGS Gauge Station

The Chippewa County Dept of Land Conservation and Forest Management has budgeted and contracted the installation of a USGS gauge in the Yellow River Watershed in 2021. The gauge was installed in the spring of 2021 within the Big Drywood Creek HUC 12 sub-basin. It will serve a dual purpose as a monitoring asset and a community outreach/education tool.

In stream water volumes will be paired with concentration data to define pollutant loading rates for the Big Drywood Creek Watershed and will help to estimate pollutant loading within the Yellow River watershed area. Such measurements will also be used to further refine/calibrate STEPL modeled phosphorus loads for the HUC 12 sub-watersheds shown in this plan.

The LWSP acknowledges that direct modeling results cannot be transferred model to model, but intends to use percent reductions between models to show pollution reduction as a percentage.

Map 17 shows the location of the USGS Gauge in the Yellow River Watershed



A link to live USGS data for this gauge can be found at the following link:
https://waterdata.usgs.gov/wi/nwis/uv/?site_no=05364128&PARAMeter_cd=00065,00060

9.14 Dock Monitoring

Starting in the summer of 2018, the Lake Wissota Stewardship Project has worked with the Lake Wissota Improvement and Protection Association to implement an “End of the Dock” observation program. Lakefront property owners go to the end of their dock at a consistent time interval. During the sampling events, the landowners fill out a lake perception rating that is consistent with the CLMN lake perception rating parameters.

Rating Parameters are outlined in the table below. Results are reported in an online environment and compiled at the end of the year to examine trends.

Table 29 shows the monitoring parameters for volunteers to report water conditions on a weekly basis from the end of their docks.

Table 29

Appearance	1=Clear
	2= Murky
Water Color	1= Blue
	2=Green
	3= Brown
	4= Red
	5= Yellow
Perception	1= Beautiful, could not be any nicer
	2= Very minor aesthetic problems; excellent for swimming and boating enjoyment
	3= Swimming and aesthetic enjoyment of lake slightly impaired because of high algae levels
	4= Desire to swim & level of enjoyment of lake substantially reduced because of algae; would not swim, but boating is Ok
	5= Swimming and aesthetic enjoyment of lake substantially reduced because of algae levels
Lake Level 2	1= High
	2= Normal
	3= Low
Wind Direction	N= Wind from North
	NE= Wind from North-east
	E= Wind from East
	SE= Wind from South-east
	S= Wind from South
	SW= Wind from South-west
	W= Wind from West
	W

Figure 33 and 34 show an algae bloom on Lake Wissota, taken by a dock monitoring volunteer.

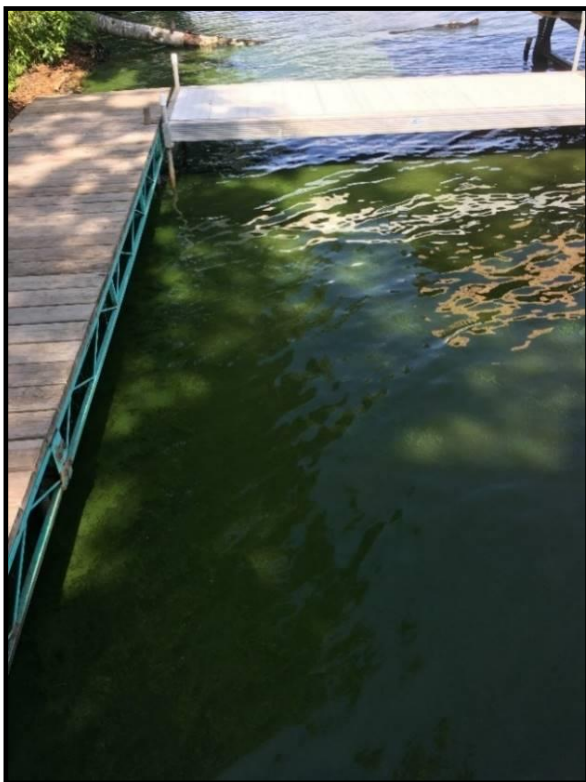
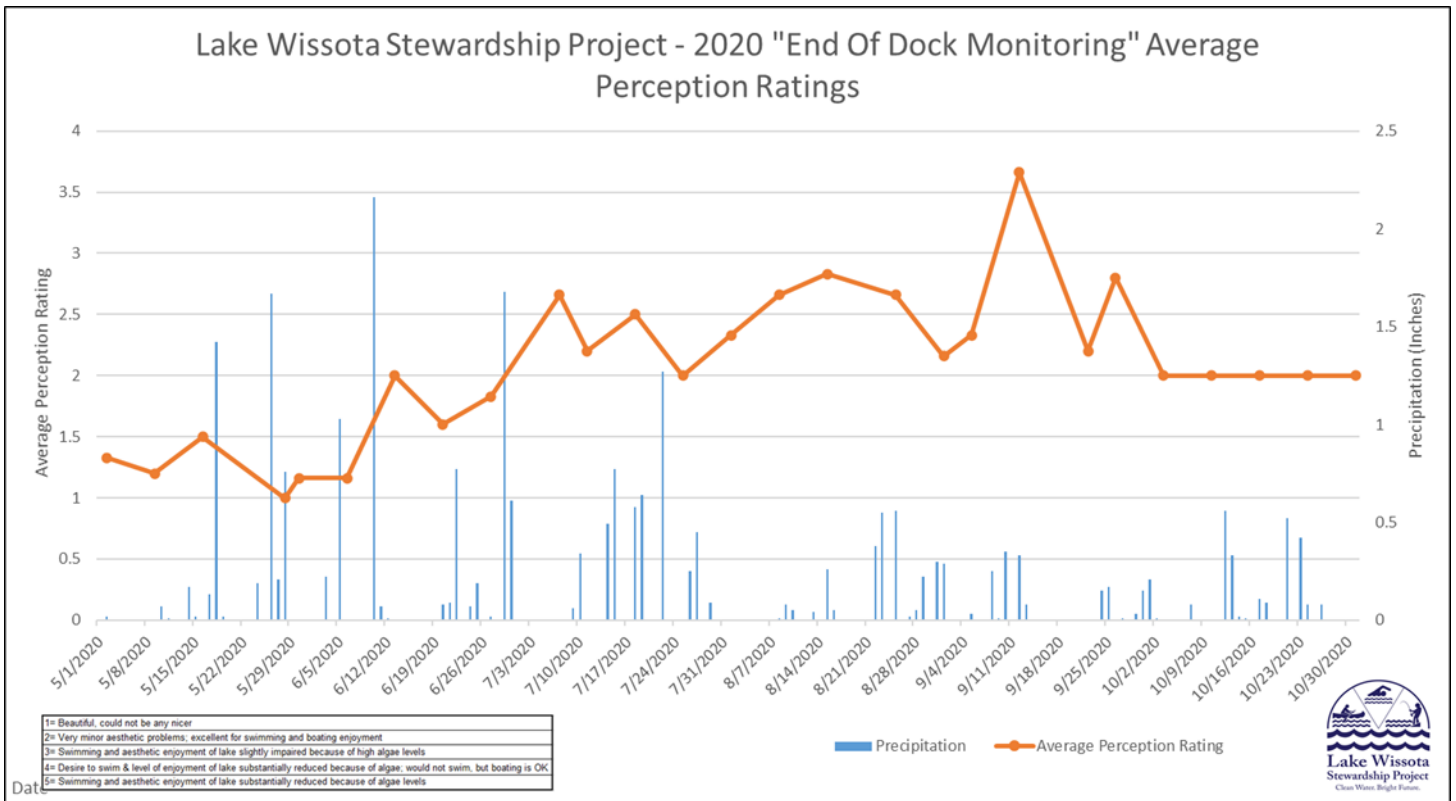


Figure 33



Figure 34

Figure 35 – End of Dock Monitoring Data 2020



9.15 Weather Monitoring

Chippewa County Land Conservation and Forest Management has deployed 2 remote weather stations into agricultural cropland settings (spring 2021).

Objectives in collecting and disseminating weather data include:

- 1) Assist with agricultural decision making, especially awareness of soil and weather conditions that are risky for contributing sediment and nutrients to surface water and / or nutrients to groundwater (precipitation, soil temperature, soil moisture, evapotranspiration, etc.); and
- 2) Increase understanding of climate change and impact upon local food production and land use management.

The target audience for this information includes farmers, crop consultants, school system science teachers, environmental professionals, and others.

WatchDog 2900ET remote weather stations are located on Rosholt sandy loam in the Town of Eagle Point, and on Almena / Spencer silt loam in the Town of Goetz. The Town of Goetz weather station is located in the Yellow River Watershed. Follow the internet links provided below to access each:

1. Central Chippewa County (Co Y, Town of Eagle Point) (Rosholt sandy loam)

<https://www.SpecConnect.net/currentconditions/publicview?serialnumber=290026351&title=Current+Conditions&units=F.in.mph.df.psi&rfhours=24>

2. Eastern Chippewa County (110th Ave, Town of Goetz) (Almena / Spencer silt loam)

<https://www.SpecConnect.net/currentconditions/publicview?serialnumber=290026365&title=Current+Conditions&units=F.in.mph.df.psi&rfhours=24>

Once every hour current condition weather values are updated and posted onto these sites.

Weather values are logged every 15 minutes into an on-going archive.

Measured weather parameters include air temperature, wind direction and speed, 24 hr. precipitation, relative humidity, dew point, heat index, 24 hr. estimated evapotranspiration, soil temperature and soil moisture at 6 inches and 18 inches deep.

Figure 36 – Weather Station in the Yellow River Watershed



9.16 Water Quality Monitoring Progress Evaluation

This plan recognizes that estimated pollutant load reductions and expected improvement in water quality or aquatic habitat may not occur immediately following implementation of practices due to several factors (described below) that will need to be taken into consideration when evaluating water quality data. These factors, in addition to climatic and stream flow variation that occurs during stream sampling can affect or mask progress that plan implementation has made elsewhere. Consultation with the DNR and Water Quality biologists will be critical when evaluating water quality or aquatic habitat monitoring results. Employing a multi-year trend analysis will be necessary when evaluating stream TP concentration levels.

If the stream target values/goals for water quality improvement are not being achieved over time, then the water quality targets or timetable for pollutant reduction for the Yellow River HUC 12 sub-basins will need to be re-evaluated by WDNR and LWSP staff and adjusted, as necessary.

The following criteria will be evaluated when water quality and aquatic habitat monitoring is completed after implementation of practices in the watershed:

- Changes in land use or crop rotations within the same watershed where practices are implemented (i.e., increase in cattle numbers, tillage intensity, corn silage acres, and/or urban areas can negatively impact stream or lake quality and water quality improvement efforts)
- Location in watershed where land use changes or crop rotations occur. (Where are these changes occurring in relation to implemented practices and sampling sites?)
- Watershed size, location where practices are implemented and location of monitoring sites.
- Climate, precipitation, and soil conditions that occurred before and during monitoring periods. (Climate and weather patterns can significantly affect growing season, soil conditions, and water quality)
- Frequency and timing of monitoring.
- Percent of watershed area (acres) or facilities (number) meeting NR 151 performance standards and prohibitions.
- Percent of watershed area (acres) or facilities (number) that implement and maintain implemented practices over time.
- Extent of gully erosion on crop fields within watershed over time. How many are maintained in perennial vegetation vs. plowed under each year?
- How “Legacy” sediments already within the stream and watershed may be contributing P and sediment loads to stream.
- Presence and extent of drain tiles in watershed area in relation to monitoring locations. Do these drainage systems contribute significant P and sediment loads to receiving streams?
- Does monitored stream meet IBI and habitat criteria but does not meet TMDL water quality criteria?
- Are targets reasonable? Load reductions predicted by models could be overly optimistic

Appendix 1

Objective 3

Develop and implement a climate change flood control stream and wetland buffer initiative to mitigate the impacts of extreme weather events associated with climate change, with the objective of reducing runoff controlling flood peaks, and limit nonpoint source pollution.

Apply the initiative to augment and expand the scope and utility of the WI Conservation Reserve Enhancement Program (CREP) using the administrative framework of that program.

Action 1

Create a conceptual proposal for a pilot project using permanent conservation easements and advance a funding request through the County Capital Improvement Program (CIP) planning process.

Objective 4

With interested lake associations and WDNR, determine interest and feasibility of advancing a basin-wide management approach to manage water quality on the impounded flowages of the Chippewa River.

Objective 5

Support state and local efforts to pursue water quality objectives through the development and implementation of Total Maximum Daily Load (TMDL) limits in designated EPA 319 watersheds.

Action 1

Develop and seek approval of an EPA Nine Key Element watershed implementation plan for Little Lake Wissota.

- Systematically implement the watershed plan using the established administrative framework of the Lake Wissota Stewardship Project.
- Systematically evaluate the progress that is being made during and at the end of the prescribed project period (2018-2023).

Action 2

With the Lake Wissota Improvement & Protection Association, co-sponsor and participate in an EPA Nine Key Element watershed planning process to develop water resource management and pollution load reduction goals and water quality objectives for Moon Bay of Lake Wissota.

- Develop, enter, and if appropriate, periodically renew formal working agreements and service contracts with project sponsors and participating municipalities and funding agencies.

Action 3

With the Lake Wissota Improvement & Protection Association, administer the Lake Wissota Stewardship Project as the water resource management mechanism to account for, reduce, and monitor point and nonpoint source pollutant loads to Little Lake Wissota, and to meet any established TMD pollution load reduction goals and water quality management objectives for Moon Bay of Lake Wissota.

- Support efforts to actively solicit corporate and business co-sponsors using the existing public/private sector watershed business model.
- Actively pursue state and federal grants, private grant sources, and community contributions to meet planned program objectives.

Objective 6

Administer a joint storm water management program, that meets EPA and NR 216 storm water permit requirements, with affected municipalities in the Chippewa Falls Urban Area to meet requirements of General Storm Water WPDES Permit #WI-S050075-2.

Action 1

Administer components of the joint program following process and commitments defined in the Chippewa Falls Urban Area Storm Water Plan, the Chippewa County Stormwater and Construction Site Erosion Control Ordinance, and associated Chapter 66.03 agreement between Chippewa County, the Village of Lake Hallie, and the Towns of Eagle Point, Anson, and Lafayette.

Objective 7

Administer the NR 151 storm water nonpoint pollution control performance standards in select circumstances using the authority of Wisconsin Stats. 92, 281, and Administrative Rules NR 103, NR 115, and NR 216.

Action 1

Review and revise the existing working agreement between Chippewa County and WDNR as it applies to storm water plan review in unincorporated areas, subject to NR216 storm water permit requirements.

Objective 8

Recognize and better define the linkages between public health, climate change, land use, and nonpoint source pollution.

Action 1

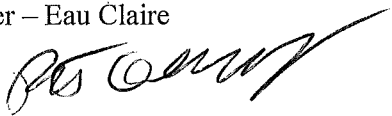
Establish structured and ongoing communication between the Chippewa County LCFM Committee, Planning & Zoning Committee, and the Chippewa County Health & Human Services Board, and associated departments, to identify and address issues related to environmental public health.

Appendix 2

CORRESPONDENCE/MEMORANDUM

DATE: 2 October 2018

TO: Jodi Lepsch and Chris Willger – Eau Claire

FROM: Pay Oldenburg – Eau Claire 

SUBJECT: Yellow River/Moon Bay EPA 9-Key Element Plan Goal Setting

This report summarizes the derivation of recommended water quality goals for Moon Bay on Lake Wissota in Chippewa County Wisconsin. A 9-Key Element Plan is currently being developed for the Yellow River Watershed which drains into Moon Bay.

Lake Wissota is on Wisconsin's 303(d) list of impaired waters for phosphorus related impairments. Lake Wissota is currently categorized as a stratified reservoir with an applicable phosphorus criterion of 30 $\mu\text{g/L}$ (mean summer residence time \sim 19 days).

Moon Bay has been assessed and listed separately for phosphorus related impairments. The summer mean phosphorus in Moon Bay is 106 $\mu\text{g/L}$ with a mean chlorophyll of 41 $\mu\text{g/L}$. The 2016 listing details for Moon Bay are cited below.

Table 1. Moon Bay 303(d) listing details

Pollutant	Listed For	Impairments	Current Use	Listing Status
Total Phosphorus	Recreation	Eutrophication	Full Body Contact - Swimming, Boating	303d Listed
Attainable Use	Priority	Designated Use	WATERS ID	Listing Date
Full Body Contact - Swimming, Boating	Low	Full Body Contact - Swimming, Boating	1521808	04/01/2008

The Yellow River is the major tributary to Moon Bay. Relatively high flows from the Yellow River contributed to a low average summer hydraulic residence time for the bay of \sim 9 days, which contrasts with the higher hydraulic residence time of Lake Wissota. Flow from the Yellow River, the generally shallow nature of Moon Bay, and general east-west orientation of the bay to the prevailing winds limits the time Moon Bay is stratified during the summer.

The reservoir phosphorus criteria are based on limiting the frequency of algal blooms based on in-lake phosphorus concentrations. Data from Moon Bay has demonstrated nuisance algal blooms in the lake, calling for reductions in in-lake phosphorus concentrations. Nuisance algal blooms are defined as exceeding 20 $\mu\text{g/L}$ chlorophyll a. For stratified reservoirs, the impairment threshold is 5% of days of nuisance algal blooms during the sampling season. For non-stratified reservoirs, the impairment threshold is 30% of days of nuisance algal blooms during the sampling season (WDNR 2015). Moon Bay experiences nuisance algal blooms on \sim 80% of days. In addition, the World Health Organization reports exceeding a density of 100,000 cyanobacterial cells per ml (which is equivalent to approximately 50 $\mu\text{g/L}$ of chlorophyll a, if cyanobacteria dominate) as a guideline for a high illness risk in recreational waters (WHO 2003). It is estimated that Lake Wissota experiences algal blooms in excess of 50 $\mu\text{g/L}$ chlorophyll a on \sim 40% of days during the sampling season.

Several alternate goals for Moon Bay were evaluated:

1. 30 µg/L TP (promulgated criteria for stratified reservoirs, i.e. main body of Lake Wissota)
2. Allow for 5% of days with chlorophyll (CHL) > 20 µg/L (algal target for stratified reservoirs)
3. 40 µg/L TP (promulgated criteria for mixed reservoirs)
4. Allow for 30% of days with CHL > 20 µg/L (algal target for mixed reservoirs)

A simplified export coefficient approach can be used to provide an estimate of the phosphorus loads coming from various sources throughout the watershed. Land cover in the basin was derived from Wisland 2.0 Level 2 and are depicted in the table below. Associated land cover export coefficients were primarily developed from the Wisconsin Lake Modeling Suite (WiLMS) software. The WiLMS “most likely” values were derived from values published in Panuska and Lillie (1995), Corsi et al (1998) and Minnesota Pollutant Control Agency (MPCA, 2004).

Table 2. Yellow River watershed land cover and estimated phosphorus loads.

Land Cover	Area (km ²)	Export (kg/ha/yr)	Data Source	Estimated Load (kg/yr)	Controllable Source?
Developed, High Intensity	1.0	1.5	WiLMS	144	Yes
Developed, Low Intensity	11.6	0.5	WiLMS	578	Yes
Crop Rotation	208.8	1	WiLMS	20,881	Yes
Forage Grassland	74.6	0.3	WiLMS	2,239	Yes
Idle Grassland	33.0	0.17	MPCA	562	No
Coniferous Forest	61.3	0.09	WiLMS	552	No
Broad-leaved Deciduous Forest	455.9	0.09	WiLMS	4,104	No
Open Water	17.1	0.1	WiLMS	171	No
Floating Aquatic Herbaceous Vegetation	0.7	0.1	WiLMS	7	No
Emergent/Wet Meadow	41.9	0.1	WiLMS	419	No
Lowland Scrub/Shrub	40.0	0.1	WiLMS	400	No
Forested Wetland	214.4	0.09	WiLMS	1,930	No
Barren	0.1	1	WiLMS	8	Yes
Shrubland	0.2	0.13	MPCA	2	No

Using this approach, the estimated nonpoint phosphorus load to Moon Bay is estimated at 31,994 kg/yr or 70,535 lbs/year. James (2004) estimated the external phosphorus load into Moon at 58,532 kg/yr based on monitoring from April 2001 – March 2003. However, these monitoring years had higher than normal precipitation, 4.35-8.65” above normal depending on station. Similarly, stream flows in adjacent watersheds were above normal. Flows during 2001-2002 were ~40% above the 20-year average at both the USGS gages on the Jump River at Sheldon and the Black River at Neillsville. Wetter weather likely explains in part the discrepancy between these two loading estimates.

Steady-state modeling was conducted using a spreadsheet version of Wisconsin Lake Modeling Suite. The models were based on loading estimates derived from the export coefficient outlined above, average runoff and evaporation rates for Chippewa County and lake bathymetry described in James. Based on this exercise, three models fit the data and provided results similar to the 106 µg/L long term summer average phosphorus value for Moon Bay (model numbers 5, 7 and 9 in attached results). These same models were evaluated against the 2001-2003 flow and phosphorus loading estimates. Again, these three

models were able to simulate the monitored in-lake phosphorus of 122 $\mu\text{g/L}$ from 2001-2002. These models were then used to form the basis for the phosphorus loading reduction goals. Some of the goal scenarios require a back-calculation of in-lake phosphorus goals from chlorophyll data. The BATHTUB model described in James provided a relationship in-lake phosphorus and chlorophyll concentration. The procedures for determining algal bloom frequency based on monitoring data are provided in the 2016 version of WisCALM (DNR 2015).

Figure 1. In-lake total phosphorus response to changes in external loading.

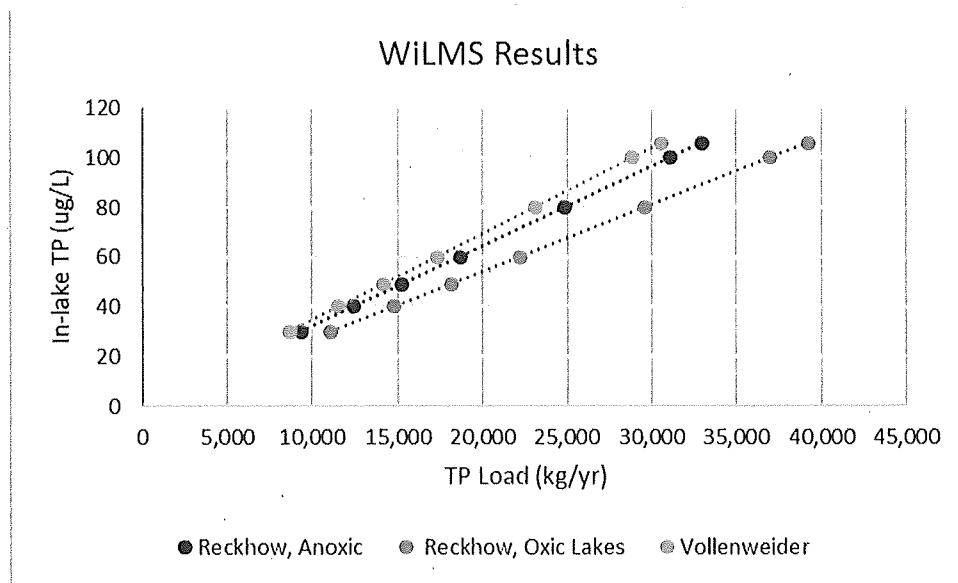
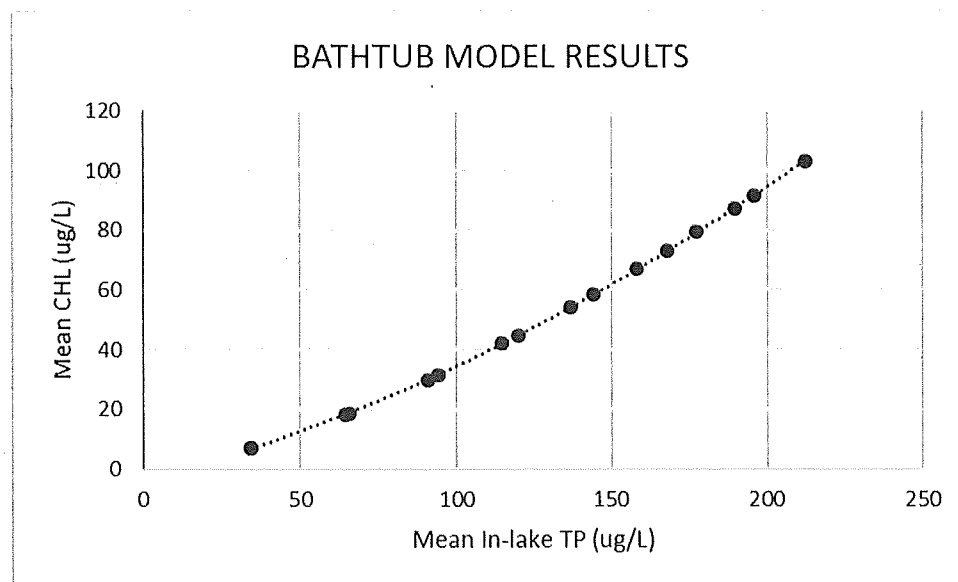


Figure 2. Mean in-lake chlorophyll versus in lake total phosphorus.



For scenarios 1 & 3, the relationship in Figure 1 was used to determine percent reduction needed to meet the desired in-lake phosphorus concentration of either 30 or 40 $\mu\text{g/L}$. As the slopes of the lines are very

similar, all three models resulted in similar percent reductions, even if the total loads were somewhat similar.

The mean chlorophyll concentration corresponding to a given in-lake mean phosphorous concentration was determined based on the relationship in Figure 2. The percentage of days exceeding 20 µg/L chlorophyll was then calculated based on the WisCALM approach.

For scenarios 2 & 4, the mean chlorophyll necessary to meet the associated bloom frequency was back-calculated based on the WisCALM approach. Once the mean chlorophyll was determined, the corresponding in-lake phosphorous concentration and reduction needed was determined based on the relationships in Figures 1 and 2.

The results of the different scenarios are outlined below:

Table 3. Lake goals.

Parameter	Current	Scenario 1	Scenario 2	Scenario 3	Scenario 4
TP	106	30	27	40	49
% Reduction	0%	72%	75%	62%	54%
Mean CHL	41.4	5.4	4.5	8.9	12.3
% Days with CHL>20 µg/L	79%	8%	5%	19%	30%

Because of the short residence time and mixed nature of Moon Bay, it is recommended that water quality goals be based on algal bloom frequency in Moon Bay (scenario 4). The selected chlorophyll target is consistent with those recommended for other eutrophic reservoir systems in Wisconsin (e.g. Petenwell/Castle Rock).

The percent reductions given in Table 3 are based on the total load, a portion of which is derived from natural background sources and likely uncontrollable. Table 2 categorizes the various land uses by whether or not they are controllable. Based on the classifications and export coefficients in Table 2, a 72% reduction from the controllable sources would be needed to meet the total load reduction of 54% of Scenario 4.

REFERENCES

- Corsi, S.R., Graczyk, D.J., Owens, D.W., and Bannerman, R.T.. 1998. Unit-Area loads of suspended sediment, suspended solids, and total phosphorus from small watersheds in Wisconsin. U.S. Geological Survey Fact Sheet FS 195-97.
- James, W.F., 2004. Phosphorus Loading and Trophic Status of Lakes in the Yellow River Watershed, West-Central Wisconsin. Eau Galle Aquatic Ecology Laboratory, U.S. Army Corps of Engineers.
- Minnesota Pollution Control Agency (MPCA). 2004. Detailed Assessment of Phosphorus Sources to Minnesota Watersheds (Appendix I). Prepared by Barr Engineering Company.
- Panuska, J.C. and R.A. Lillie. 1995. Phosphorus Loadings from Wisconsin Watersheds: Recommended Phosphorus Export Coefficients for Agricultural and Forested Watersheds. WDNR Research Findings Report No. 38. PUBL-RS-738 95. 8p.

Smith, R.A., Schwarz, G.E. and Alexander, R.B. 1997, Regional interpretation of water-quality monitoring data, Water Resources Research, v. 33, no. 12, pp. 2781-2798

Wisconsin Department of Natural Resources (WDNR). 2015. Wisconsin 2016 Consolidated Assessment and Listing Methodology (WisCALM) for CWA Section 303(d) and 305(b) Integrated Reporting. Guidance # 3200-2015-01.

WISCONSIN LAKE MODEL SPREADSHEET

VERSION 2.01 - AUGUST 1996

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Although this model has been tested by WDNR, no warranty is expressed or implied. See user's manual prior model use.

LAKE ID Moon Bay

To auto load wtrshd data, enter county ID, hold CTRL and type L.

WATERSHED COUNTY IDENT. NUMBER = 9CO. NAME: Chippewa

HYDROLOGIC AND MORPHOMETRIC MODULE

	ENGLISH	METRIC
TRIB. DRAINAGE AREA =	286764.0Ac.	1.16E+09m ²
TOTAL UNIT RUNOFF =	9.3In.	0.236m
ANNUAL RUNOFF VOLUME =	222242.1Ac-Ft.	2.74E+08m ³
LAKE SURFACE AREA <As> =	357.0Ac.	1.44E+06m ²
LAKE VOLUME <V> =	4376.0Ac-ft.	5.40E+06m ³
LAKE MEAN DEPTH <z> =	12.26Ft.	3.74m
PRECIP. - EVAP. =	3.4In.	0.09m
HYDRAULIC LOADING =	222343.3Ac-Ft/Yr	2.74E+08m ³ /Yr
AREAL WATER LOAD <qs> =	6.23E+02Ft/Yr.	1.90E+02m/Yr
LAKE FLUSHING RATE <p> =	50.81/Yr Tw =	0.02Yr

PHOSPHORUS LOADING MODULE

--LOADING (Kg/Ha-Yr)--

LAND USE	AREA (AC)	MOST			LOADING PERCENT
		LOW	LIKELY	HIGH	
ROW CROP AG	51598.0	0.50	1.00	3.00	64.5
MIXED AG	0.0	0.80	0.80	1.40	0.0
PASTURE/GRASS	18443.0	0.10	0.30	0.50	6.9
HD URBAN	237.0	1.00	1.30	2.00	0.4
MD URBAN	2856.0	0.40	0.50	0.80	1.8
RURAL RES.	0.0	0.05	0.10	0.25	0.0
WETLANDS	77646.0	0.10	0.10	0.10	9.7
FOREST	127830.0	0.05	0.09	0.18	14.4
IDLE GRASSLAND	8154.0	0.09	0.17	0.34	1.7
OTHER LAND USE 2	0.0	0.00	0.00	0.00	0.0
LAKE SURFACE	357.0	0.10	0.27	1.00	0.1

POINT SOURCE WATER LOADING (m ³ /Yr) =				0.00E+00	---
POINT SOURCE PHOS. (Kg/Yr)		0.00	0.00	0.00	0.0
SEP. TANK OUTPUT (kg/cp-yr)		0.30	0.50	0.80	---
# capita-years =	2856.00	----	----	----	---
% P. RETAINED BY SOIL =		98	90	80	---
SEP. TANK LOADING (Kg/Yr)		17.14	142.80	456.96	0.4
TOTAL LOADINGS (Lb) =		39248.6	71350.9	180052.3	100.0
TOTAL LOADINGS (Kg) =		17803.0	32364.6	81671.2	100.0
AREAL LOADING (Lb/Ac-Yr) =		110	200	504	
AREAL LOADING (mg/m ² -yr) =		12322	22401	56529	
% TOTAL PHOSPHORUS REDUCTION =					0

PHOSPHORUS PREDICTION MODULE

THE OBSERVED SPRING TOTAL PHOSPHORUS = mg/m³
 THE OBSERVED GROWING SEASON PHOSPHORUS = 106 mg/m³

Enter the spring and/or the growing season P concentration.
 The lake models predict either an SPO or a GSM P concentration.
 A predicted phosphorus concentration will appear only for those
 models where the observed value has been entered. An "NA" is
 returned if a model is not calculated.

Spring Overturn P conc = SPO; Growing Season Mean P conc = GSM

LAKE PHOSPHORUS MODELS	PREDICTED TOTAL PHOSPHORUS (mg/m ³)		
1. WALKER, 1987 RESERVOIR MODEL (GSM)			92
	50	92	231
2. CANFIELD-BACHMANN, 1981, NATURAL LAKE MODEL (SPO)			#N/A
3. CANFIELD-BACHMANN, 1981, ARTIFICIAL LAKE MODEL (SPO)			#N/A
4. RECKHOW, 1979, NATURAL LAKE MODEL (GSM)			94
	51	94	236
5. RECKHOW, 1977, ANOXIC LAKE MODEL (GSM)			104
	57	104	263
6. RECKHOW, 1977 OXIC LAKES qs < 50 m/yr (GSM)			#N/A
	#N/A	#N/A	#N/A
7. RECKHOW, 1977 OXIC LAKES qs > 50 m/yr (GSM)			88
	48	88	221
8. WALKER 1977, GENERAL LAKE MODEL (SPO)			#N/A
	#N/A	#N/A	#N/A
9. VOLLENWEIDER, 1975 LAKE MODEL (SPO and GSM)			112
10. DILLON-RIGLER-KIRCHNER, 1975 LAKE MODEL (SPO)			#N/A
P. RETENTION COEFF. <R> qs < 10 m/yr			#N/A
P. RETENTION COEFF. <R> qs >= 10 m/yr			0.09

UNCERTAINTY ANALYSIS MODULE

LAKE RESPONSE MODEL	PREDICTED MINUS OBSERVED (mg/m ³)	PERCENT DIFF.	80	PERCENT CONFIDENCE INTERVAL
1. WALKER, 1987 RESERVOIR	92	#DIV/0!	48	203
2. CANFIELD-BACHMANN, 1981	#N/A	#N/A	#N/A	#N/A
3. CANFIELD-BACHMANN, 1981	#N/A	#N/A	#N/A	#N/A
4. RECKHOW, 1979 GENERAL	-12	-11	46	210
5. RECKHOW, 1977 ANOXIC	-2	-2	56	230
6. RECKHOW, 1977 qs<50m/yr	#N/A	#N/A	#N/A	#N/A
7. RECKHOW, 1977 qs>50m/yr	-18	-17	58	187
8. WALKER, 1977 GENERAL	#N/A	#N/A	#N/A	#N/A
9. VOLLENWEIDER, 1975	6	6	--	--
10. DILLON-RIGLER-KIRCHNER	#N/A	#N/A	--	--

<= Range within which 95% of the observations should fall.

See user's manual discussion on the use of these models.

PARAMETER RANGE MODULE

Model input values MUST be within the ranges listed below.
 WILMS displays FIT if inputs satisfy conditions; NO FIT if not.

PARAMETERS			
AREAL WATER LOADING <qs=z/Tw> =		1.90E+02m/yr	
INFLOW PHOSPHORUS CONC.<LTw/z> =		0.118mg/l	
MEAN DEPTH <z> =		3.74m	
FLUSHING RATE <p> =		50.81/yr	
HYDRAULIC RETENTION TIME <Tw> =		0.02yr	
AREAL PHOSPHORUS LOADING <L> =		22401.04mg/m ² -yr	
P = PREDICTED IN LAKE PHOS. CONCENTRATION mg/m ³			
1. WALKER, 1985 RESERVOIR MODEL			(41)
1.5 < z < 58 m	0.13 < Tw < 1.91 yr	<NO FIT>	
0.014 < LTw/z < 1.047 mg/l		P=	92
2. CANFIELD-BACHMANN, 1981 NATURAL LAKE MODEL			(290)
4 < P < 2600 mg/m ³	30 < L < 7600 mg/m ² -yr	#N/A	
0.2 < z < 307 m	0.001 < p < 183/yr	P=	#N/A
3. CANFIELD-BACHMANN, 1981 ARTIFICIAL LAKE MODEL			(433)
6 < P < 1500 mg/m ³	40 < L < 820,000 mg/m ² /yr	#N/A	
0.6 < z < 59 m	0.019 < p < 1800/Yr	P=	#N/A
4. RECKHOW, 1979 NATURAL LAKE MODEL			(47)
4 < P < 135 mg/m ³	70 < L < 31,400 mg/m ² -yr	<NO FIT>	
0.75 < qs < 187 m/yr		P=	94
5. RECKHOW, 1977 ANOXIC LAKE MODEL			(21)
17 < P < 610 mg/m ³	0.024 < LTw/z < 0.621mg/l	<FIT>	
		P=	104
6. RECKHOW, 1977 OXIC LAKES qs < 50 m/yr			(33)
P < 60 mg/m ³	LTw/z < .298	#N/A	
mg/l		P=	#N/A
7. RECKHOW, 1977 LAKES WITH qs > 50 m/yr			(28)
P < 135 mg/m ³	LTw/z < 0.178 mg/l	<FIT>	
Tw < 0.25 yr	z < 13 m	P=	88
8. WALKER, 1977 GENERAL LAKE MODEL			(105)
P < 900 mg/m ³	LTw/z < 1.0	#N/A	
mg/l		P=	#N/A
9. VOLLENWEIDER, 1975 GENERAL LAKE MODEL			(FIT)
NOT AVAILABLE			P= 112
10. DILLON, RIGLER, KIRCHNER, 1975 LAKE MODEL			(15)
P < 15 mg/m ³	107 < L < 2210 mg/m ² -yr	#N/A	
1.5 < qs < 223 m/yr	0.21 < p < 63/yr	P=	#N/A

WATERSHED LOAD BACK CALCULATION MODULE

This section will calculate predicted phosphorus loads for each model given an in-lake phosphorus concentration.

Enter the spring and/or the growing season P concentration. WIILMS will calculate a watershed load using the appropriate models. An "NA" is returned if the model requires either a spring overturn or growing season mean phosphorus concentration and one is not provided.

NOTE: To calculate the Canfield-Bachmann models, the user MUST enter the spring phos. concentration, hold CTL and PRESS "C".

OBSERVED SPRING OVERTURN TOT. PHOS. (SPO) = 0 mg/m³
 OBSERVED GROWING SEASON MEAN PHOS. (GSM) = 106 mg/m³

LAKE PHOSPHORUS MODELS	PREDICTED PHOSPHORUS LOAD (Kg/Yr)
1. WALKER, 1987, RESERVOIR MODEL (GSM)	37409
2. CANFIELD-BACHMANN, 1981, NATURAL LAKE MODEL (SPO)	#N/A
3. CANFIELD-BACHMANN, 1981, ARTIFICIAL LAKE MODEL (SPO)	#N/A
4. RECKHOW, 1979, NATURAL LAKE MODEL (GSM)	36662
5. RECKHOW, 1977, ANOXIC LAKE MODEL (GSM)	32949
6. RECKHOW, 1977 OXIC LAKES qs < 50 m/yr (GSM)	#N/A
7. RECKHOW, 1977 OXIC LAKES qs > 50 m/yr (GSM)	39198
8. WALKER 1977, GENERAL LAKE MODEL (SPO)	#N/A
9. VOLLENWEIDER, 1975 LAKE MODEL (SPO and GSM)	30603
10. DILLON-RIGLER-KIRCHNER, 1975 LAKE MODEL (SPO)	#N/A
P. RETENTION COEFF. <R> qs < 10 m/yr	#N/A
P. RETENTION COEFF. <R> qs >= 10 m/yr	0.09

Appendix 3

CONCLUSIONS

Water quality indicators (i.e., total P, chlorophyll, and Secchi transparency) for both Little Wissota and Moon Bay of Lake Wissota reflected eutrophic conditions and sensitivity to external P loads from the Yellow River, Paint, and Drywood Creeks. Tributary flows and external P loading to Moon Bay from the Yellow River and Drywood Creek was particularly high due to the relatively high volume of runoff from these large watersheds. Flow-weighted concentrations of total and soluble reactive P were greater than 0.09 mg/L and 0.03 mg/L, respectively, for the Yellow River entering Moon Bay during the summer period. Although P loads from Drywood Creek were much lower compared to the Yellow River, flow-weighted concentrations of total and soluble reactive P were the highest of all the tributaries monitored at ~0.145 mg/L and ~0.100 mg/L respectively. Phosphorus loading to Little Wissota Bay from Paint Creek was much lower compared to external P loads to Moon Bay. However, flow-weighted concentrations of total and soluble reactive P for Paint Creek inflows were also high at greater than 0.085 mg/L and 0.045 mg/L.

For most lakes examined in the Yellow River watershed, mean summer chlorophyll was markedly higher in 2001 than in 2002 even though P loading characteristics and P concentrations in the surface waters were similar. Lowest concentrations of chlorophyll typically occurred during the early summer of 2002. Seasonal differences may be attributed to enhanced grazing pressure or hydrological perturbations (i.e., variations in flushing) that occurred during 2002. However, clear explanations for these year-to-year differences in chlorophyll concentration are not apparent.

Summer mean concentrations of total P and chlorophyll were 0.115 mg/L and 42 mg/m³, respectively, for Moon Bay and 0.068 mg/L and 28 mg/m³, respectively, for Little Wissota Bay in 2001. Hypolimnetic anoxia with associated increases in concentrations of total P developed in the bottom waters of both bays during summer 2001, but not in 2002. Laboratory-derived rates of internal P loading from profundal sediments in both bays were very high under anoxic conditions (range = 17 – 38 mg m⁻² d⁻¹), suggesting they could become an important source of P to the water column under conditions of prolonged anoxia. However, summer patterns in 2001 and 2002 did not suggest the occurrence of significant vertical transport of hypolimnetic P to the epilimnion for either bay.

Water quality indicators of both bays were responsive to simulated P loading reductions from tributary inflows, suggesting water quality improvement with decreases in P loading. In addition to external P loading sensitivity, algal biomass was also regulated by a high flushing rate in Moon Bay. Had residence time been great in this bay due, for instance, to draught conditions, chlorophyll could have been much higher than values observed for the summer of 2001. Although internal P loading from profundal sediments did not appear to be an important flux to the epilimnetic P budget of either bay during the study period, it may become a more important contribution to the epilimnion during prolonged drought conditions coupled with strong thermal stability and extensive hypolimnetic anoxia in the future. Currently, however, P management for water quality improvement should focus on reductions in external P loadings to each bay.

Eutrophic Chequamegon Flowage was also sensitive to simulated external P loading reduction, suggesting concomitant reductions in chlorophyll and improvement of Secchi transparency with decreased external P loading from the Yellow River. Laboratory-derived rates of P release from profundal sediments were also very high under anoxic conditions. Intermittent development of anoxia in the bottom waters of the deep basin of the lake and the accumulation of P in the hypolimnion suggested linkages to diffusive P flux from sediments under anoxic conditions. These patterns coupled with a relatively low Osgood Index and high residence time suggested additional susceptibility of the epilimnetic P budget to internal P loading and vertical P transport. Poor response to external P loading reductions in the future could be indicative of internal P loading contributions sustaining productivity in the lake. However, as with the other lakes in the Yellow River basin, management plans should make reducing external P loading to the lake the first priority for P control.

Otter Lake exhibited substantial hypolimnetic anoxia and the buildup of very high concentrations of total P in the bottom waters throughout the growing season, indicating marked internal P flux from profundal sediments. Total P concentrations in the bottom waters exceeded 3 mg/L by early August. Rates of P release from sediments measured in the laboratory were also very high at $\sim 20 \text{ mg m}^{-2} \text{ d}^{-1}$. However, more information is needed on the distribution of P throughout the water column in order to better assess the importance of vertical P transport to the P economy of the epilimnion. As with other lakes, Otter Lake was very sensitive to changes in P loading. Simulated P loading reductions were accompanied by marked improvements in predicted chlorophyll concentrations and Secchi transparency.

Pike Lake exhibited similar extensive hypolimnetic anoxia and high concentrations of P in the bottom waters. However, water quality indicators suggested that the lake is mesotrophic, compared to other much more eutrophic lakes in the Yellow River Basin. Although laboratory-derived rates of P release were high under anoxic conditions and P accumulated in the hypolimnion during the summer, lack of higher concentrations of chlorophyll and total P in the surface waters suggested that vertical P transport to the epilimnion is probably minor during the summer. The mean summer chlorophyll concentration was only 9-10 mg/m^3 and the mean total P concentration was only 0.022 - 0.029 mg/L. Lake management plans will need to consider the impact of riparian development around the lake and direct overland runoff to the P budget since there are no defined tributary inflows to the lake. The role of vertical P transport from the hypolimnion to the epilimnion will also need to be considered in future management of the lake. Although P concentrations were high in the hypolimnion, transport to the surface may not be an important factor to the productivity of the system.

REFERENCES

Ameel, J.J., Axler, R.P., and Owen, C.J. 1993. Persulfate digestion for determination of total nitrogen and phosphorus in low nutrient water. *Am. Environ. Lab.* (October, 1993):8-10.

APHA (American Public Health Association). 1998. *Standard Methods for the Examination of Water and Wastewater*. 20th ed. American Public Health Association, American Water Works Association, Water Environment Federation.

Appendix 4

The Red Cedar River Basin Project

The Red Cedar River Basin Project began in 1995 as a pilot project in the State of Wisconsin. This project was initiated jointly by the DNR and UW-Extension. A goal of this project is to involve local partners in water quality planning and programming on a watershed scale with its main focus on reducing phosphorus input to the Red Cedar River. This project has since evolved into the formation of a Steering Committee that involves stakeholders including participation and leadership from local industry, farmers, academics, conservation groups, environmentalists, wastewater treatment plants, and local governments. The Steering Committee has developed the following vision:

"To improve and preserve water quality in the Red Cedar River Basin by identifying and understanding the problems and promoting education and cost-effective, innovative water management solutions."

Figure 9 - Red Cedar River Basin



The purpose of the steering committee is to provide representation of stakeholders in the Red Cedar River Basin in 1) identifying water quality issues, problems, and basin needs; 2) seeking management alternatives, formulating solutions and coordinating implementation; and 3) prioritizing water quality projects and goals. Initially a series of public meetings were held to discuss and gather input on the Red Cedar River Basin. As a result a list of water quality issues and concerns such as agricultural runoff, storm water management, land use, and shoreland management were identified. This list has been used as a foundation for activities and projects of the Red Cedar River Basin Steering Committee.

Land and Water Resource Issues, Goals and Objectives

Land and water resource staff and the Partner Team worked together to identify important resource issues within the Lower Chippewa River Basin. These nine issues reflect the highest resource concerns of Department staff, the Basin Partner Team, and the public who attended open houses.

For each of the issues, staff and the Partner Team developed goals and objectives that were identified as most valuable for the resource needs of the Lower Chippewa River Basin. These goals and objectives are specific to the Basin but also reflect the Department's Strategic Goals, Strategic Implementation Plan and the Fisheries, Wildlife and Habitat Management Plan for Wisconsin - 2001 through 2007.

Priorities and Work Planning

The nine issues are listed in order of relative importance based on input from DNR staff, the Partner Team and the public. The DNR has the skills, knowledge and resources to address many of these issues, goals and objectives; for some, other agencies or entities are more appropriate. Considerations for work effort expended by the WDNR on these issues will include the ability of the department to play a role in addressing the issue, the resource benefit that can be accomplished related to the issue and the timeliness of the issue for achieving results.

Watershed Data Bases as Decision-making Tools

Beginning in December 1999, Basin Water Team staff began the process of developing a database for housing the extensive inventory information that has been collected on the surface water resources of the basin. Previously, much of this information has been scattered and difficult to locate.

The watershed database will allow far better utilization of resource information. It can be queried to locate specific information and reports can be generated directly from the database. Links can be created between watershed database information and other databases or geographic information systems.

It is anticipated that when the database is completely functioning, it will be a key tool for work planning. It will assist in identifying specific inventory and management activities, and locations where these activities are needed to achieve the goals and objective for identified priority issues.

In addition, groundwater and other databases, as identified in Chapter 3 of this report, will be utilized for work planning.

1996 Water Quality Management Plan

The watershed discussions and management recommendations found in the 1996 Lower Chippewa River Water Quality Management Plan will continue to be an important for workplanning and decision-making, until they are updated in coming years.

Comment Codes within the Basin Goals and Objectives

Where the Basin Goal and Objectives are substantially similar to goals and objectives identified in other plans, comment codes identify these plans as follows:

- **I, II, III and IV:** The Department's Strategic goals, listed as I, II, III and IV above.
- **SIP:** The Department's Strategic Implementation Plan.
- **FWH:** The Fisheries, Wildlife and Habitat Management Plan for Wisconsin for 2001 through 2007.

Issues, Goals and Objectives

- A. **Habitat: Loss, impairment, and fragmentation of native habitats have jeopardized the ecosystem function of sustaining, balanced communities of aquatic (groundwater and surface water) and terrestrial, animal and plant populations.**

Goal 1: Manage for a biologically diverse, balanced and healthy aquatic ecosystem, which meets fishable and swimmable standards and the WDNR strategic objectives for biodiversity. Support databases for aquatic systems.

Objective 1

Implement and promote shoreland habitat protection and restoration activities.

Performance Measures

- a. At the end of 2003, two new shoreland restoration demonstration projects are successfully completed.
- b. A Basin pilot shoreland restoration training workshop is completed in 2002.
- c. Interpretive signs are installed at three restoration sites by June 2002.
- d. Conduct at least one public tour annually at the Lake Wissota State Park Shoreland Habitat Restoration Demonstration site.

Goal 2: Identify and protect critical spawning, reproductive, and nursery habitat in Wisconsin lakes, streams and rivers. [FWH]

Objective 1

Conduct studies on the free-flowing portions of the Chippewa and Red Cedar Rivers to better understand the populations, movement and critical habitat of Channel and Flathead Catfish. Recent baseline monitoring documented a low density, but quality sized flathead catfish fishery, and a strong population of channel catfish in the lower Red Cedar and lower Chippewa Rivers.

This study will provide a baseline of information on catfish populations, prior to implementation of new flow regimes in 2003, as a result of the Lower Chippewa River FERC Settlement Agreement. Significant changes in river flow will improve habitat conditions for all river species, and will likely significantly improve recreational and angling opportunities.

Performance Measures

- | | |
|---|--------------------|
| a. Collect aging data and mortality estimates | June 2003 |
| b. Collect a population estimate on the lower Red Cedar River. | June 2003 |
| c. Obtain movement and harvest information by angler tag returns. | June 2003-On Going |
| d. Final Report and Entry into FH database. | March 2004 |

Objective 2

Conduct a Habitat Use Assessment for the shovelnose sturgeon and blue sucker on the Lower Chippewa and lower Red Cedar River. Regional fisheries staff will collect seasonal movement and habitat selectivity information using radio telemetry and pit tags on shovelnose sturgeon and blue sucker. This assessment will replicate an assessment conducted in the 1960's and will answer many critical questions about two species for which there is very little comprehensive information available in Wisconsin or the nation.

Performance Measures

- a. Fieldwork will be completed in 2002.
- b. Data analysis and report writing will be completed by March of 2003.
- c. Publication of results and distribution to fisheries biologists throughout the state as well as the upper Midwest.

Objective 3

Survey selected cold water resources each year to evaluate the status of trout populations, the effectiveness of past stocking, and to identify sites with native fish where non-native fish like brown trout or hatchery fish should not be introduced. Survey sites are selected to assess the need for fish passage, the effects of flow regime changes, the effects of past stocking, and to maintain reference sites.

Performance Measures

- a. Trout populations in 12 to 15 cold water streams are surveyed annually.

Goal 3: Improve critical habitat sites in the basin with stream bank protection or in-stream habitat restoration to enhance sport fisheries. [FWH]

Objective 1

Restore degraded stream banks on selected streams to stabilize banks, reduce long term erosion and create improved habitat for trout populations. Maintain or repair previously stabilized banks to extend their habitat functions.

Performance Measures

- a. Restore and/or repair 3200 feet on Cady Creek (LC03), 2100 feet on Elk Creek (LC13) and 2000 feet on McCann Creek (LC21) during FY'02.
- b. Restore and/or repair 3800 feet on Elk Creek (LC13), 3200 feet on Trimble Creek (LC23) and 800 feet on the Eau Galle River (LC03) during FY'03.
- c. Post-restoration trout population surveys will indicate success of this project.

Other desired actions**Habitat protection and improvement**

- a. Promote incentive programs for habitat protection or improvement in cooperation with other agencies.
- b. DNR staffs work with other agencies, non-governmental organizations and local governments in preparing comprehensive plans based on the *Ecosystem Decision Management Model (SIP)*.
- c. Identify and prioritize threatened or sensitive biological communities in the Basin where feasibility studies are needed.
- d. Address ecosystem management through Managed Forest Law (MFL) and Forest Stewardship Plan writing.
- e. Focus on habitat restoration to improve natural reproduction of game and fish species, reducing the need for stocking programs.
- f. Characterize the fish, mussel, and aquatic insect community in 5 sites per GMU in critical river and stream habitats on an annual basis. [FWH]
- g. Reduce flathead catfish harvest. Manage it as a trophy sportfish.

Land Acquisition

- h. Secure fee title or permanent easements in order to allow habitat restoration to occur in a timely manner.
- i. Identify opportunities to protect, enhance or restore threatened ecosystems through the Acquisition 2050 Plan. [FWH]
- j. Acquire lands identified as high priority within existing Streambank Protection, Wildlife, Fishery and Natural Areas.
- k. Achieve land acquisition objectives for the Western Prairie Habitat Restoration Area and the Lower Chippewa State Natural Area. [FWH]

Shorelands

- l. Assist local units of government in planning and protection of sensitive shoreland areas.
- m. Promote use of Forestry Best Management Practices in riparian areas. [FWH]

Wetlands

- n. Identify and prioritize wetlands in need of protection, restoration and enhancement. [FWH]
- o. Protect wetland complexes with exceptionally high value through acquisition, incentives and other innovative strategies by federal, state and local government and not-for-profit conservation organizations. [FWH]
- p. Improve coordination with army corps of engineers during wetland permitting processes.
- q. Fisheries, Invert, Aquatic Macrophyte and water quality monitoring of major floodplain lakes and sloughs of the Chippewa River.

B. Sediment and Nutrient Sources: Excessive sedimentation to surface waters and the release of nutrients (nitrogen and phosphorus) from point and nonpoint sources into the Lower Chippewa River Basin are degrading surface and groundwater for beneficial uses and threaten natural, diverse aquatic communities.

Goal 1: Achieve water quality improvement for 303(d) Impaired Waters through the TMDL process. [FWH]

Objective 1

Conduct a nutrient study of the Yellow River watershed to develop a TMDL recommendation for Lake Wissota. This study will include nutrient sampling, flow monitoring, load determination, water quality modeling of Moon Bay, with "BATH TUB" to determine nutrient sensitivity, and "SWAT" modeling analysis of the watershed, to determine nutrient loading distribution.

Performance Measures

- a. Stream monitoring data for the first two years of this project will be summarized in a report prepared in 2003 by the COE.
- b. Monitoring data and modeling results will be summarized in reports prepared by USGS and COE during 2003.
- c. All of the monitoring and modeling data will be incorporated into development of the TMDL, which will be completed in 2004.

Objective 2

- a. Conduct a nutrient study in the Rice Lake and Red Cedar Lake Watersheds in Barron and Sawyer counties to develop TMDL recommendations for the Red Cedar Basin. This study will include monitoring of in-flowing nutrient loads and in-lake water quality conditions, determination of nutrient loads and hydrologic budgets, completion on "BATHTUB" modeling of the lakes and "SWAT" modeling of the watershed, to develop management goals and implementation strategies.
- b. Conduct a study of the level of phosphorus present in groundwater within the Red Cedar Basin. TMDL development for Tainter Lake needs to account for the influence of all sources of phosphorus. The setting of a water quality goal and the ability to achieve it depends on the level of phosphorus control possible. There is some current evidence to indicate that both deep and shallow aquifers may have unexpectedly high levels of P (near 1 ppm). This study will examine a number of wells in the Basin for phosphorus concentration. If high levels are common throughout the basin then additional work may be needed in the second year of the biennium to further quantify that source.

Performance Measures

Objective 2a:

- a. Monitoring is completed by September 2002.
- b. Monitoring data and modeling results will be summarized in reports prepared by USGS and COE during 2003.
- c. Management goals and implementation strategies will be completed during FY'03, and the monitoring and modeling reports for these lakes will be incorporated into the Tainter Lake TMDL.
- d. Complete the Red Cedar Basin TMDL by the end of 2006.

Objective 2b:

- a. A written report detailing the extent of high phosphorus-bearing groundwater in the basin is completed at the end of FY'02.

Objective 3

Complete a TMDL plan for Half Moon Lake in Eau Claire County.

Performance Measure

- a. A draft plan for the Half Moon Lake TMDL is completed by December 2001.
- b. A final plan for the Half Moon Lake TMDL is completed by July 2002.

Objective 4

Seek funding for monitoring other 303(d) Impaired Waters.

Performance Measures

- a. Conduct two years of lake and stream monitoring for Mead Lake, a 303(d) Impaired Water, following receipt of funding.
- b. Update 303(d) impaired waters list for the basin by April 2002.

Goal 2: Qualified local units of government seek available grants or other sources of financial support for pollution control activities.

Objective 1

Identify local units of government or communities that are qualified to apply for Target Runoff Management (TRM) and Urban Nonpoint Source grants, and opportunities for resource benefit through these grant programs. Assist identified local units of government in competing for grant funding.

Performance Measures

- a. Qualified local units of government complete grant applications and compete effectively for grant funding.

Other actions

- a. Promote landowner participation in nutrient management planning.
- b. Promote the use of best management practices for small farms to reduce surface water impairment.
- c. Work cooperatively with county governmental units to effectively administer and enforce nutrient and sediment controls.
- d. Work cooperatively with local units of government, developers and individuals to effectively administer and enforce construction site erosion control permits and stormwater control ordinances.
- e. Promote effective control of erosion at construction sites, through training sessions for contractors, developers and local units of government.
- f. Control the discharge of sediment and nutrients from point sources through regulatory programs.
- g. Assist counties in the update of land & water resource plans.

C. Development: Rural landscape and associated natural communities are being transformed into rural residential areas, compromising the biological integrity of the landscape and creating forest fire protection issues. Growth and development of business and industry on urban perimeters encroaches on green space, destroys wildlife habitat, impacts wildlife distribution, and alters infiltration and drainage patterns, with resulting flood hazards and water quality impairments.

Goal 1: Identify and implement strategies to buffer the effects of rural residential development adjacent to sensitive habitat [FWH].

Objectives

Provide relevant resource monitoring or inventory data to local units of government within the basin that are developing comprehensive land use plans under the Smart Growth program.

Performance Measures

- a. West Central Regional Planning Commission receives resource data for communities that they are contracted with for Smart Growth planning assistance, including the cities of Rice Lake and Thorp, and the towns of Cleveland, Bloomer and Goetz in Chippewa County.

Other Actions

- a. Assist communities with stormwater planning.
- b. Assist communities with sewer service area planning.
- c. Promote forest fire awareness in wildland/urban interface areas.

D. Drinking Water and Groundwater: Agricultural and industrial practices, as well as urban/rural development threaten a high quality and plentiful groundwater resource in the Lower Chippewa Basin

Goal 1: Protect drinking water and groundwater quality from agricultural, industrial and urban/rural development activities. [II, III]

Objective 1

The Safe Drinking Water Act requires states to implement a Source Water Assessment Program to protect public health by preventing contamination of public water supplies. Each public water system requires an assessment, which includes 1) delineation of assessment area boundaries; 2) inventory of significant potential sources of contamination within the boundaries and 3) a susceptibility determination for each well.

Performance Measures

- a. Complete the ongoing survey of potential contaminant sources for public water supplies, by completing the survey of transient non-community systems by December 2001.
- b. Complete the ongoing digitizing of potential contaminant sources for public water supplies, by completing digitizing of other-than-municipal community systems and non-transient non-community systems by December 2001.
- c. Complete data entry of public well information (depends upon completion of data entry template by the Bureau of Drinking Water).
- d. Complete Source Water Assessment Reports for all public water supply systems in the Basin by 2007.

Objective 2

Assist local units of government in developing public wellhead protection plans.

Performance Measure

- a. DNR staff will promote wellhead protection plans as part of their annual inspection of all municipal waterworks.
- b. At least one new wellhead protection plan is approved annually for the next five years.

Objective 3

Assist local units of government and landowners to promote proper well abandonment techniques.

Performance Measure

- a. DNR staff will contact all county zoning offices annually, that not already offering cost-sharing programs for well abandonment to promote such programs.
- b. DNR staff will track the number of wells properly abandoned in each county annually, to assess well abandonment program effectiveness.

Objective 4

Promote public awareness of well construction advisory areas and atrazine prohibition areas.

Performance Measure

- a. List all advisory areas and atrazine prohibition areas on the DNR website by 2003.

Objective 5

Counties become qualified to issue their own well and pump installation permits, to assure timely and effective groundwater protection during these activities. When qualified, the DNR can delegate this responsibility to these counties.

Performance Measure

- a. DNR staff assists at least one county annually to qualify for delegation of issuance of well and pump installation permits.
- b. DNR staffs monitor all counties with delegated permit authority to assure compliance.

Objective 6

Basin Water Team members and partners become more informed about groundwater quality issues in the basin. This includes a review of the numerous past and current water sampling programs and resulting data, to understand the extent of groundwater contamination from nitrates, pesticides or other contaminants, and any trends that can be discerned. It also includes an understanding of the range of preventive and corrective measures that are available to address groundwater quality.

Performance Measures

- a. A small Subteam group will present information and lead a discussion on groundwater issues for a Water Team Meeting by August 2001.
- b. At the direction of the Water Team, a selected Subteam will prepare a follow-up report for the Water Team by December 2001, to include specific recommendations for reducing the level of contaminants currently found in public and private wells in the basin.

Goal 2: Protect drinking water and groundwater quantity from agricultural, industrial and urban/rural development uses and activities. [II, III]

Objective 1

Identify inventory needs for high capacity wells, and complete needed inventories.

Performance Measure

- a. Inventory of high capacity wells is completed by 2003.

Objective 2

Work with communities and citizens to promote water conservation practices. Conservation practices can include reduction of water loss due to leaking pipes, changes in citizen water use for activities such as lawn watering or car washing, and development of ordinances to limit excessive water use.

Performance Measure

- a. DNR staff will assist at least one priority community annually in the development and promotion of new or improved water conservation practices.
- b. DNR staff will track annually the change in water use per capita in communities that initiate water conservation practices.

Other Actions

- a. Work with local units of government to promote stormwater planning to effectively develop, administer and enforce stormwater control ordinances, in accordance with established rules (NR151). Work with other agencies (COM), to incorporate safe infiltration of stormwater and groundwater recharge, in accordance with existing performance standards (NR 151) and technical standards as they are developed.
- b. Provide continuing education for well drillers and pump installers.
- c. Provide sewage treatment plant operator certification training and waterworks training.
- d. Promote proper disposal of wastes (oil, pesticides, paints, solvents etc.) and proper application of commercial fertilizers.
- e. Team with Remediation and Repair and Solid Waste program staff, as well as other state agencies like DATCP, Commerce and DOT, to identify contaminated wells and insure groundwater contamination remediation.
- f. Decrease the % of drinking wells not meeting Maximum Contaminant Levels.

E. Inventory and Monitoring: Efficient and effective resource management depends on knowledge of the current condition of each resource and whether the resource is stable, improving or declining. Basic inventory and monitoring data collection is incomplete and is needed for resource management decisions.

Goal 1: Sufficient inventory data is available for sound resource management decisions.

Objective 1

Implement a basin-wide "Wadable Stream Monitoring Program". See Appendix 10, Basin Monitoring and Management Schedules and Plans, for more detailed information.

Performance Measures

- a. Sample 50 to 65 sites per year, 10-15 sites per watershed on a 5-year rotational basis to obtain spatial and temporal coverage of the entire basin.
- b. Collect stream habitat and fish community data, temperature and macroinvertebrate samples using standardized protocols, to assess local, regional and statewide status and trends of stream integrity.
- c. Sample four "least-impacted" reference streams annually for long-term trend comparisons.
- d. Enter field data generated each year into the Statewide Fish and Habitat Database and into the Basin Watershed Tables database.

Objective 2

Implement "Nonwadable Baseline Monitoring" at selected sites on the Lower Chippewa, Lower Eau Claire and Upper and Lower Red Cedar Rivers. See Appendix 10, Basin Monitoring and Management Schedules and Plans, for more detailed information.

Performance Measures

- a. Conduct baseline nonwadable stream monitoring using protocols identified in the January 2001 nonwadeable baseline monitoring guidance.
- b. Enter field data generated each year into the Statewide Fish and Habitat Database and into the Basin Watershed Tables database.
- c. Complete a final report by March 2002 for sites on the Eau Claire River.

Objective 3

Implement basin-wide "Lakes Monitoring Program". See Appendix 10, Basin Monitoring Schedules and Plans, for more detailed information.

Performance Measures

- a. Sample 4 to 7 lakes per year within the basin on a 5-year rotational basis to obtain spatial and temporal coverage of the entire basin.
- b. Collect a suite of biological and physical parameters, using standardized protocols to assess local, regional and statewide status and trends of lake ecosystem integrity.
- c. Enter field data generated each year into the Basin Watershed Tables database.

Objective 4

Conduct a comprehensive fisheries and habitat survey of the Yellow River and its tributaries from the dam at Chequamegon Waters Flowage downstream to Lake Wissota, including the Paint Creek and Drywood Creek subwatersheds. The study will include a baseline monitoring component for wadable streams, a baseline monitoring project for nonwadable streams, and a comprehensive, warmwater streams survey. See Appendix 10, Basin Monitoring Schedules and Plans for more detailed information.

Performance Measures

- a. Completion of all survey elements during FY'02 and FY'03.
- b. Entry of field data generated into the statewide database system by the end of FY'03.
- c. Completion of watershed report by FY'03.

Objectives 5

Conduct monitoring activities at prioritized dam sites to assess dam impacts on water resources and environmental conditions, and to develop a management strategy.

Performance Measures

- See Dams issue for performance measures identified for this objective.

Other desired actions

- a. Evaluate and report the impact of harvest and regulations on sportfish large river systems by 2007.
- b. Creel Census Recommended for lower 17.5 miles of the Red Cedar River from Menomonie downstream to the mouth 2003-2004. Priority ranking is high.
- c. Creel Census Recommended for lower 61 miles of the Chippewa River from Dells Dam to Lake Pepin 2003-2004. Priority ranking is high.
- d. Integrate monitoring and inventory activities between programs for efficient use of staff and resources.

- e. Reduce and/or eliminate the backlog of unanalyzed, unreported survey data, to improve trend evaluation capability.
- f. Develop trends indexing for lakes, rivers, streams, and groundwater.
- g. Develop data sharing agreements with local units of government, other institutions, and partners involved in land use planning and help them apply the data to local decisions. [FWH]
- h. Collaborate with researchers from area Universities in collection of field data.
- i. Conduct a post-evaluation of the Colfax IEM project.
- j. Develop and improve the capacity to use the Aquatic and Terrestrial Resource Inventory (ATRI) system, and to search and download Natural Heritage Inventory information and data on the Internet to support land use and management decisions. [II, FWH]

F. Dams: There is a need to reduce the number of streams impacted by aging smaller dams, which no longer serve their original function. Many present safety hazards and cause habitat impairment, including altered temperature regimes, create barriers to fishery populations and movement, and affect water quality. Identification of the departmental role in community decision-making is necessary.

Goal 1: Improve stream habitat and public safety by removal, modification or operational changes of small dams that no longer serve their original function. Restore the ecological integrity of flowing waters through dam removal or modification.

Objectives

- a. Develop a prioritized list of dams in need of inspection, based on established inspection schedules and the potential for resource improvement.
- b. Conduct monitoring activities at prioritized dam sites to assess dam impacts on water resources and environmental conditions.
- c. Develop management recommendations and alternatives for monitored dam sites.
- d. Assist interested communities in making dam repair or removal decisions.
- e. Remove dams on state-owned property where removal is the recommended action based on monitoring.

Performance Measures

- a. A prioritized list of dams for inspection and monitoring is developed by April, 2001.
- b. Monitoring is completed at prioritized dams between April and August 2001. Dams where more intensive monitoring is needed are identified, and monitoring at these sites is completed by October 2002.
- c. A written report is completed which details the extent of potential for environmental improvement through dam removal or modification on selected streams by December 2002.
- d. Educational and public involvement activities are planned and implemented for at least one interested community by June 2002.
- e. At one or more dam sites annually, the ecological integrity of flowing waters is improved through removal, modification or operational changes.

Hydropower dams and their operations have the potential to impact river ecology and recreational use opportunities. The FERC relicensing process provides unique and timely opportunities to minimize these impacts.

Goal 1: Minimize impacts of hydropower operations (FERC) on large river ecosystems of the basin.

Objective 1:

- a. At least one DNR staff member, trained and experienced in the FERC relicensing process, participates in each FERC relicensing proceeding.
- b. Hydropower operations comply with FERC Settlement Agreements.

Performance Measures

- a. DNR fisheries and habitat recommendations are incorporated into the Red Cedar River FERC Settlement Agreement in 2003.
- b. Issue 401 certification for the Chippewa River hydropower projects within 180 days of the signing date of the Lower Chippewa River Settlement Agreement and for the Red Cedar River hydropower projects by 2003.

G. Education: Changing resource issues and needs in the Lower Chippewa basin require an integrated, dynamic educational strategy to address the public need for resource information. Successful resource management depends on a well-informed public that understands resource problems and potential solutions.

Goal 1: An integrated educational strategy fosters public understanding of resource problems and potential solutions of the Lower Chippewa Basin. [I]

Objective 1

The Lower Chippewa River State of the Basin Report is an educational tool for the public.

Performance Measures

- a. The report is available on the web and contains active links to other relevant web sites by August 2001.
- b. Hard copies of the report are available at all public libraries, LWCD, UWEX and DNR offices in the Basin.

Objective 2

An education team consisting of DNR staff and Partnership members will draft an educational strategy that addresses the educational needs of land, forestry and water programs.

Performance Measures

- a. A draft educational strategy is completed by July 2002.
- b. Incorporate components of the basin education strategy into DNR and UW-Extension Lower Chippewa River Basin web sites, in cooperation with the UW-EX Basin Educator.

Goal 2: Educational initiatives target specific resource needs in the basin.

Objective 1

Implement and promote shoreland habitat protection and restoration activities.

Performance Measures

- a. See Goal 1, Habitat Issue.

Other Actions

- a. Utilize the resources of the Bureau of Communication and Education in developing an educational strategy and materials (<http://intranet.dnr.state.wi.us/int/caer/cc/>).

- b. Promote "EEK" (<http://www.dnr.state.wi.us/org/caer/ce/eeek/>), "Into the Outdoors", and other educational programs already in place.
- c. Increase departmental interactions, workshop presentations and partnerships with local youth educators.
- d. Promote Lakes Partnership education strategies.
- e. Provide forestry education related to sustainable forestry, fire protection and fire management techniques for prairie maintenance.
- f. Provide construction site erosion control education

H. Recreation: Access to privately owned lands and public water for outdoor recreation, hunting and fishing is diminishing as land ownership and land uses change. Public land and water is also impacted by increased recreational use pressure and user conflicts.

Goal 1: The public has adequate access to land for outdoor recreation through a combination of public and privately owned lands that are managed sustainably for compatible recreational uses and environmental protection uses. [IV]

Objective 1

Work with partners and DOT to coordinate the completion of the Chippewa Valley Trail System providing a continuous corridor from Brunet Island State Park at Cornell through Chippewa Falls and Eau Claire along the Chippewa and Red Cedar Rivers to Menomonie.

Performance Measures

- Completion of the Chippewa Valley Trail System by 2005.

Goal 2: Provide a variety of fishing opportunities for experienced and novice anglers by managing for a variety of sport fisheries consistent with statewide guidelines and regulations categories. Improve sport fishing by protecting, maintaining and restoring critical habitat for natural sport fish stocks and their associated aquatic communities.

Objectives and Performance Measures

See the Habitat Issue, Goals 1-3.

Other Actions

- a. Support access to sport fishing and other recreational opportunities for all citizens.
- b. Consider outdoors recreational needs in making land acquisition decisions.
- c. Promote incentive programs for public access on private lands for recreation.
- d. Assist local units of government in developing management plans to ensure compatible use opportunities for the available resources.
- e. Improve access to large rivers and lakes and streams.

I. Staff/Agency Concerns: The need and demand for resource management and environmental protection services is increasing, but available staff and funding have not kept pace.

Goal 1: Citizens, who live, work and recreate in the Lower Chippewa Basin are represented in and share responsibility for resource management decisions.

Objective

The GMU Partnership team represents a wide range of interested partners, has clear goals and shares responsibilities for managing the Basin's resources.

Performance Measures

- a. The number and diversity of partnership team members will be maintained or increased.

Goal 2: Adequate program and professional support is provided to allow staff to focus on utilizing their expertise and experience in carrying out their work responsibilities.

Needs

- Regional staff support is provided for clerical tasks, data entry, and other routine activities.
- Regional staff and support are provided for GIS mapping and database development.

Appendix 5

**ADDENDUM TO THE CHIPPEWA COUNTY OPERATIONAL AGREEMENT
BETWEEN DNR & CHIPPEWA COUNTY LAND CONSERVATION DEPARTMENT
FOR THE
ADMINISTRATION AND IMPLEMENTATION OF AGRICULTURAL
NONPOINT POLLUTION PERFORMANCE STANDARDS AND PROHIBITIONS
UNDER NR151 AND NR243**

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Appendix A. Working with Landowners to Implement
Agricultural Performance Standards and Prohibitions Under NR 151

Overview and Flow Chart

- Letter Type A
- Letter Type B
- Letter Type C
- Letter Type D
- Letter Type E

Purpose

This memorandum of understanding is an addendum to a multi-agency operational agreement that exist between the Chippewa County Land Conservation Committee, WI Department of Natural Resources, WI Department of Agriculture, Trade and Consumer Protection, Chippewa County Extension and USDA Natural Resources Conservation Service (date).

This MOU has been developed by the Chippewa County Land Conservation Committee (LCC) and the Wisconsin Department of Natural Resources (DNR) to clarify their respective roles and responsibilities as needed to:

- Implement and enforce agricultural nonpoint pollution performance standards and prohibitions established in ch. NR 151, Wis. Adm. Code.
- Implement ch. NR 243, Wis. Adm. Code as it applies to the permitting of livestock operations and the investigation of livestock facility complaints.
- Systematically phase out the Duncan Creek Priority Watershed Project, initiated and implemented under ch. NR 120, Wis. Adm. Code.

This agreement defines the commitment of each party to conduct administrative tasks that have been defined by Wisconsin conservation agencies as standardized components of a program delivery system. The standardized components are in a guidance document titled *Implementation Strategy for NR 151 Agricultural Performance Standards and Prohibitions*¹ (hereafter referred to as the State-wide Implementation Strategy).

Specifically, this agreement clarifies how the DNR and the County will:

- Incorporate the State-wide Implementation Strategy into routine agency operations.
- Systematically evaluate and define the level of agency commitment to the NR 151 and NR 243 workload using a county-sponsored annual needs assessment and interagency work planning process.
- Conduct information and education activities.
- Systematically select and evaluate parcels to determine compliance with standards and prohibitions.
- Prepare compliance reports and notify landowners of compliance status.
- Provide technical assistance and cost-sharing funding as needed to allow landowners to meet performance standards and prohibitions.
- Issue notice letters under NR 151.09 and NR 151.095 as appropriate.
- Monitor compliance.
- Conduct enforcement activities.
- Develop annual reports.

¹ *This document was prepared jointly by WI Dept. of Natural Resources, WI Dept. of Agriculture, Trade, and Consumer Protection, the WI Land and Water Conservation Association, and the WI Association of Land Conservation Employees (April, 2002). It has been approved by the Wisconsin Land and Water Conservation Board as Appendix E to the Land and Water Resources Management Plan Guidelines. The document can be found at <http://dnr.wi.gov/org/water/wm/nps/rules/NR151strategy.htm>.*

A. As a basis for this agreement, the parties agree:

1. State statutes and associated administrative rules establish the requirement that agricultural performance standards and prohibitions, established in NR151, must be implemented. (ss. 92.07, 92.10, 92.105, 92.14 and 281.16, Wis. Stats., chs. NR 151 and ATCP 50, Wis. Adm. Code.)
2. The responsibility and authority to administer and implement the agricultural performance standards and prohibitions has been delegated through State statutes and administrative rules to DNR, DATCP, and local municipalities, including the County Land Conservation Committees.
3. DNR is the state agency responsible for administering NR 243, and for implementing NR 151.09, and NR 151.095. Notes in NR 151.09(2) and NR 151.095(2) state the DNR's intent to rely on County Land Conservation Committees to fully implement performance standards and prohibitions and to develop intergovernmental agreements to guide implementation.
4. DATCP is the lead state agency responsible for administering staffing grants under ATCP 50.26 for base level conservation, priority watershed activities and performance standards & prohibitions compliance.
5. DNR has authority, but limited funding, to support staff under Targeted Runoff Management grants.
6. The Chippewa County Land Conservation Committee employs qualified staff with the necessary contracting, planning, and engineering expertise needed to implement the NR151 standards.
7. Implementation of agricultural nonpoint standards and prohibitions is contingent upon the availability of trained technical staff and public cost share. Without funding and staff support for contracting and technical assistance, few, if any, contracts will be executed, or conservation practices constructed to implement performance standards and prohibitions.
8. Chippewa County and the DNR share common goals and objectives toward water resources management and nonpoint source pollution control.
9. Chippewa County and DNR have an existing operational agreement that encourages interagency cooperation to pursue common resource management objectives.
10. To optimize use of available State and County staff and program funding, it is in the mutual interest of the County and DNR to clarify program responsibilities and to make commitments necessary to implement State law and administrative rules.
11. This agreement will be reviewed annually. Either party may cancel its agreement with 90 days written notice.

I. Component 1: Plan the Implementation Approach

A. The parties agree:

1. The State-wide Implementation Strategy provides a structural framework that can be used to discuss and plan how the parties will cooperate to implement the agricultural performance standards and prohibitions.
2. This memorandum of understanding and the County Land and Water Plan can be used as the means to document procedures for implementing NR 151.
3. Guidance prepared by DNR and incorporated as an appendix to this agreement (*Working with Landowners to Implement Agricultural Performance Standards & Prohibitions Under NR 151*), is useful for making formal correspondence with landowners concerning compliance issues.
4. The agricultural performance standards and prohibitions are designed to achieve water quality standards by limiting nonpoint source water pollution.
5. NR 151.004 contains a process for developing targeted performance standards where implementation of statewide performance standards and prohibitions may not be sufficient to meet water quality standards.
6. Sections NR151.09, NR 151.095, ATCP 50.04 and ATCP 50.08 require agricultural landowners and operators to meet agricultural nonpoint performance standards and manure management prohibitions. These requirements are contingent upon sufficient cost sharing for existing facilities and practices.

B. Chippewa County will:

1. Use this memorandum of understanding to coordinate implementation of agricultural performance standards and prohibitions.
2. Implement select portions of the administrative rules and components of the State-wide Implementation Strategy, as defined in this agreement.
3. Revise the County Land and Water Resource Management Plan by August 1, 2004, and include a comprehensive strategy to ensure compliance with the performance standards and prohibitions required by NR151.
4. Focus NR 151 implementation activities on new and expanding cropland practices and livestock facilities.
5. Cooperate with DNR to identify priority areas where the county may apply for funding under the Targeted Runoff Management Program to alleviate violations of performance standards and prohibitions that result in significant pollutant loadings or impacts to waters of the State.

6. Cooperate with DNR in identifying the need for targeted performance standards.

C. DNR will:

1. Use this memorandum of understanding to coordinate implementation of agricultural performance standards and prohibitions.
2. Implement select portions of the administrative rules and components of the State-wide Implementation Strategy, as defined in this agreement.
3. Assign an agency representative to actively participate in the County Land and Water Resource Management planning process and provide input into the development of the County strategy to implement agricultural nonpoint performance standards and prohibitions.
4. Target its efforts, including education, evaluation, issuing notification letters under NR 151.09 and NR 15.095, and enforcement, toward:
 - a. Areas draining to Outstanding and Exceptional Resource Waters. In doing so, the Department's efforts will be directed toward *achieving* compliance for new and expanding cropland practices and livestock facilities and at *maintaining* compliance for all existing and new practices and facilities.
 - b. Areas draining to waters on the federal list of impaired water bodies (303d list), waters not meeting water quality standards or designated uses and source water protection areas. In doing do, the Department's efforts will be directed toward *achieving and maintaining* compliance for all existing and new practices and facilities.
5. Work jointly with Chippewa County to set mutual priorities for implementing agricultural performance standards and prohibitions.
6. Provide Chippewa County with guidance needed to fulfill its agreed-upon roles and responsibilities to implement portions of NR 151.
7. Conduct high priority implementation activities as needed to supplement county roles and responsibilities agreed upon in this agreement.
8. Discuss with DATCP ways in which the staffing funds from state agencies may be adjusted to categorize local county land conservation department efforts, and provide grant incentives, based upon the scope of implementation responsibilities assumed.
9. Pursue mechanisms to provide some level of county staff funding for implementing Targeted Runoff Management projects.
10. When appropriate, identify the need for targeted performance standards.

II. Component 2: Define Level of Agencies' Commitment to NR151 Workload

A. The parties agree:

1. There must be a mutual understanding of each agency's responsibilities and level of commitment in carrying out implementation of agricultural performance standards and prohibitions, including implementation and enforcement activities identified under NR151.09 and NR151.095.
2. The extent of each agency's commitment is dependent upon the availability of public funds and agency priorities and, therefore, may be expected to change through time.

B. Chippewa County will:

1. Sponsor an annual interagency work planning session, following procedures in the interagency operational agreement. Through this process, the County will formally solicit, document, and record the level of agency and county commitment towards carrying out the NR151 workload, under Components 3-10 of this agreement.

Note: Through this process, the County will seek to determine the number of full-time staff positions, (FTE), assigned by each agency (County, State, and Federal), the technical qualifications of each staff position assigned, activities to be conducted by the assigned position, and the financial resources to be committed.

C. DNR will:

1. Assign an agency representative and actively participate in the County LCC's annual interagency work planning session.
2. Use this work planning process, in conjunction with the DNR work planning process, to make staff commitments toward implementation of NR 151 workload for the upcoming year.
3. Identify site specific projects determined by the agency to be priorities, for onsite farm evaluations, cost-share funding, issuing notification letters under NR 151.09 and NR 151.095, and enforcement action when appropriate.

III. Component 3: Conduct Information and Education Activities

A. The parties agree:

1. That a structured information and educational program is a critical component of an agricultural nonpoint pollution control program.
2. An effective program will:
 - a. Educate landowners about the Wisconsin agricultural performance standards and prohibitions, applicable conservation practices, and cost-share grant opportunities.
 - b. Promote implementation of conservation practices necessary to meet performance standards and prohibitions.

- c. Inform landowners about procedures and agency roles to be used statewide and locally for ensuring compliance with the performance standards and prohibitions.
- d. Establish expectations for compliance and consequences for non-compliance.
- e. Define target audiences, educational messages for each target audience, methods and activities to deliver the educational message to each target audience, anticipated unit costs for each activity, a proposed regional or statewide budget and a proposed implementation schedule.

B. Chippewa County will:

1. Provide structured input into the development of a state-wide and regional information and education program to be designed by DNR to support and augment NR151 implementation efforts.
2. Before August 1, 2004, using funding allocated through the Duncan Creek Priority Watershed Project, develop a local information and education plan to support NR 151 implementation as outlined in this agreement.
3. Within the limits of State funding allocated, implement information and education activities as scheduled through the County's LCC's annual work plan and financed through the County budget process.

C. DNR will:

1. Develop a statewide information and education program, activity schedule and budget to support state and county efforts to implement NR 151.
2. Work with University of Wisconsin-Extension and DATCP to identify and develop information and education materials and activities needed on a statewide basis, and to make the materials accessible to Chippewa County for use and dissemination.
3. Provide input into the planning of the Chippewa County information and education program.
4. *Participate in work planning for the Lower Chippewa Basin educator to assure that time is allocated to information and education activities (planning, materials development, dissemination) needed to implement NR 151 in Chippewa County. Before January 1, 2005, develop a structured work plan for a regional information and education project.*
5. Assist Chippewa County and the basin educator, where possible, with implementation of the I&E program.

IV. Component 4a: Determine Current Compliance through Records Inventory

A. The parties agree:

1. Many crop and livestock producers in Chippewa County, working independently or through public agencies, have adopted conservation practices as part of routine operations.
2. Since 1990, a significant public investment has been made (through the WI Nonpoint Source Water Pollution Abatement Program, the WI Soil and Water Resource Management Program, and the Chippewa County Land Conservation Program) to assist owners of croplands and livestock facilities to install best management practices to control agricultural nonpoint source pollution.
3. As a result of this conservation work, there are many croplands and livestock facilities that fully or partially comply with the agricultural performance standards and prohibitions.
4. Sections NR151.09(3)(b) and NR 151.095(4)(b) require existing cropland practices and livestock facilities that achieve compliance with performance standards and prohibitions to remain in compliance regardless of public cost share.
5. Sections NR 151.09(3)(d) and NR 151.095(4)(d) require new cropland practices and livestock facilities to comply with performance standards and prohibitions regardless of cost share.
6. To establish a baseline for program implementation, it is in the public's interest that documentation be made of the location of cropland practices and livestock facilities that were in compliance as of October 1, 2002, and to inform the landowners, in writing, of the compliance determination and the requirements to maintain compliance.
7. To date, there has been no effort to conduct a systematic review of public records to document the location of cropland practices and livestock facilities that were in existence as of the effective date of the rule, or to determine their compliance status.
8. Without an effort to review public records and determine compliance, cropland owners and livestock operators will not be aware of their current compliance status or their obligations to meet or maintain the agricultural nonpoint performance standards and prohibitions, either with or without cost share.
9. State cost-share agreements, subject to contractual obligations of active operation and maintenance plans on or after October 1, 2002, can be used to document the extent of current compliance achieved through previous public investments.
10. Chippewa County will use the tax parcel as the basic geographic unit for evaluating and reporting compliance. Where a tax parcel contains more than one livestock facility or cropland practice, the evaluation and reporting system will contain information to distinguish between facilities and practices based on whether they are new, existing, in compliance and out of compliance.

B. Chippewa County will:

1. Before July 1, 2004, use State-funded priority watershed staff to compile a list of current State cost-share agreements, subject to contractual obligations of an active operation and maintenance plan in effect on or after October 1, 2002.
2. Before July 1, 2005 use State funded priority watershed staff to review these state cost share agreements and associated records to determine:
 - a. The status of contract completion, including: the installation of conservation practices; required operation and maintenance periods; the implementation of associated operation and maintenance plans.
 - b. The date of the last site visit conducted to verify or confirm compliance with terms of existing conservation contracts.
3. From the records review, make a preliminary determination as to the location of cropland practices and livestock facilities that were clearly in compliance with all performance standards and prohibitions applicable to the parcel.
4. From the records review, identify the location of parcels and operations that have records that are inconclusive and warrant an on-site evaluation to determine compliance under Component 4b.

Note: The County will evaluate whole tax parcels, as maintained on the Chippewa County Real Property Tax Listing, to determine the extent of compliance with each agricultural nonpoint performance standard and prohibition which may apply to that parcel.

5. Document results of the compliance determination on standardized evaluation forms and compliance status report formats developed by the County.

C. DNR will:

1. Review Chippewa County records evaluation forms and compliance status report forms for consistency with status determination and notification requirements under NR 151.09 and NR 151.095.
2. Provide information to Chippewa County from the DNR CAOS database as it pertains to any Duncan Creek Priority Watershed and targeted runoff management project cost-share contracts.
3. With regard to large scale livestock operations permitted under chapter NR 243:
 - a. Compile records of existing WPDES permits for Concentrated Animal Feeding Operations (CAFO) and evaluate these records to determine compliance with NR 151 agricultural performance standards and prohibitions. (Note: As of March 31, 2004 DNR has issued WPDES permits to Jenio-Turkey Store and Five Star Dairy)
 - b. When coverage applies, incorporate into WPDES permits standards that equal or exceed the requirements of NR151. (Note: The WPDES permit does not cover cropped fields where manure is not applied)

- c. Follow the compliance strategy and provide the County with copies of inspection check sheets and inspection letters sent to the facility. (Note: This strategy calls for two inspections every five years.)
- d. Provide the County with copies of portions of the WPDES permit application that describe a facility's manure storage, animal yards, and locations.
- e. Provide the County with copies of the manure management plan and its amendments that describe field locations, restrictions, manure application rates, and verification that fields meet "T".

Note: The manure management prohibitions are contained in the permit, nutrient management through the manure management plan requires meeting N&P recommendation of UW Ext., meeting "T" is shown by 590 farm plan or some other approved equivalent, clean water diversions are met with the "zero" discharge up to the 25 year storm. Manure storage is met with requirement of NRCS standard and review of plans before construction and required monitoring by operator.

Component 4b: Determine Compliance through On-Site Evaluation

A. The parties agree:

- 1. On-site evaluations are often necessary to document current resource conditions and current management practices, as a basis for determining compliance.
- 2. The accuracy of on-site evaluations will be enhanced if formal evaluation procedures and protocol are established, and standardized evaluation forms are adopted.
- 3. Greater consistency in conducting on-site evaluations can be achieved if a structured training program is established to educate staff about the standards, evaluation procedures, and requirements for program documentation.
- 4. The protocol and process for responding to public animal waste complaints, registered under NR243, has been previously established and is routinely administered through the cooperation of the DNR and the LCC (DNR/DATCP MOU, 1987).
- 5. New or expanding livestock facilities subject to regulations under NR 243 or the Chippewa County Manure Storage Ordinance should be evaluated for compliance with performance standards and prohibitions. The evaluation should be conducted prior to issuance of the state or county permits.

B. Chippewa County will:

- 1. Conduct on-site evaluations for whole tax parcels, as maintained on the Chippewa County Real Property Tax Listing, to determine the extent of compliance with each agricultural nonpoint performance standard and prohibition which may apply to that parcel.
- 2. Before December 31, 2005, as part of the Duncan Creek Priority Watershed close-out schedule, conduct on-site evaluations to complete a baseline inventory of compliance for all cost-share agreement holders.

3. Beginning June 1, 2004, within the limits of staff funding allocated by the State, systematically conduct onsite compliance evaluations for livestock facilities and cropping practices that meet any of the following criteria:
 - a. Apply for State cost-share funds, administered by Chippewa County
 - b. Request on-site evaluations through the Chippewa County Voluntary Farm Evaluation and Certification Program
 - c. Seek permits issued through the Chippewa County Animal Waste Storage Ordinance.
 - d. Are subject to a public complaint, submitted to the County or DNR .
4. Beginning June 1, 2004, ((date) NR243 M.O.U. protocol) systematically respond to public complaints, which allege that there is violation of state agricultural nonpoint performance standards and prohibitions, or which allege that there is an agricultural nonpoint discharge that may have an impact on waters of the state.
5. Within limits of State funding, attempt to conduct and document a minimum of 10-15 on-site livestock evaluations per year, and a minimum of 30-300 onsite cropland tax parcel evaluations per year.
6. Consult with DNR concerning non-routine evaluations, including evaluations of livestock facilities that are expanding and require DNR WPDES or county permits.

C. DNR will:

1. As part of the County LCC's annual work planning process have the opportunity to provide:
 - a. The location of livestock facilities and cropland parcels where, if standards are not implemented, there is a high potential for nonpoint discharge which may result in a significant impact to waters of the state.
 - b. Correspondence to the County requesting that an onsite evaluation be conducted, and a report be generated, to determine and to document the extent of current compliance.
2. Provide a structured training framework and training opportunities to educate DNR and County staff about the agricultural performance standards and prohibitions, procedures for making compliance determinations, and policy aspects of program administration.
3. Assist in developing and administering training about the use of management practices to achieve and maintain compliance with performance standards and prohibitions.
4. Assist in the identification of environmental models, site review checklists, and other assessment tools used to evaluate compliance. Assist in providing training.
5. Develop and provide standardized example evaluation forms and a companion electronic form/software application.

6. Provide assistance to the county in making status determinations for high priority or potentially controversial situations, such as those that may require notification (See Attachment A, Letter Types C and D), lead to enforcement actions or may potentially be handled by the DNR under NR 243.
7. Establish and implement a quality assurance program to establish and maintain a predefined standard of administrative performance.
8. Beginning June 1, 2004, (using 1987 NR243 M.O.U. protocol) systematically respond to public complaints registered under NR243, which allege that there is violation of state agricultural nonpoint performance standards and prohibitions, or which allege that there is an agricultural nonpoint discharge that may have an impact on waters of the state.
9. Consult with Chippewa County concerning non-routine evaluations, including evaluations of livestock facilities that are expanding and require DNR WPDES or county permits.

V. Component 5: Prepare Report and Notify Landowners of Compliance Status

A. The parties agree:

1. To be valid, the results of a record review and/or on-site compliance evaluation must be documented and be based upon confirmed facts.
2. A standardized report format will allow for the systematic collection and reporting of evaluation results and will provide consistency through time.
3. A local process, independent of a formal administrative appeal under chapter 227, Wis. Stats., can be used to provide for a structured review of any local decision pertaining to an initial finding of compliance or other decision involving the interpretation of NR 151 or ATCP 50.
4. Farm evaluation forms, compliance status reports and associated correspondence are public records that should be retained by a custodial agency.
5. The compliance status report is a document that can be used to inform the landowner about the compliance status of his/her operation, seek confirmation of information used to determine current compliance, and, if necessary, resolve disagreements regarding compliance status.
6. The information included in a compliance status report provides important baseline information needed to determine and to secure and allocate funding and technical assistance to address on-farm conservation needs.
7. A geographic data base and record keeping system is necessary to provide ready access to compliance reports completed over time.
Note: The record-keeping system is the basis for a detailed accounting of the compliance history for each parcel evaluated. Information required for each tax parcel includes: location; receiving water; status (new; existing; in compliance; not in compliance) for each performance standard and prohibition applicable to the parcel; cost-share requirements; cost-share availability; notification history; compliance deadline; best management practice application & certification history; compliance history.

8. Mapping can be used to show the cumulative location of cropland parcels and livestock facilities that have been evaluated, and the associated compliance status of these lands and facilities.

B. Chippewa County will:

1. Establish a local process to provide for reconsideration of local administrative decisions regarding findings of compliance as established in a compliance report. The LCC will be the administrative body that reconsiders decisions made by County staff in implementing NR 151.
2. Prepare a compliance status report to document the results of each record review and on-site evaluation conducted for a livestock facility or cropping practice. The compliance status report will include the following information:
 - a. Parcel status (new versus existing)
 - b. The current compliance status of individual tax parcels with reference to each of the performance standards and prohibitions.
 - c. Corrective measure options and rough cost estimates to comply with each of the performance standards and prohibitions for which a parcel is not in compliance.
 - d. Status of eligibility (costs eligible) for public cost sharing.
 - e. Grant funding sources and technical assistance available from Federal, State, and local sources, and third party service providers.
 - f. An explanation of conditions that apply if public cost share funds are used.
 - g. Signature lines indicating landowner agreement or disagreement with report findings.
 - h. The purpose of the report, the implications for achieving and maintaining compliance.
 - i. Process and procedures to discuss evaluation results with county and or state.
 - j. If appropriate, a copy of performance standards and prohibitions and technical design standards.
3. Provide a copy of the compliance status report and review it with each landowner to explain the content of the report and procedures available to contest the findings or request a reevaluation. In doing so, the County will use the administrative process outlined in the flowchart included in Appendix A. This includes preparing, signing and delivering to landowners Letter Types A and B from Appendix A.
4. In circumstances where the facts and findings of the compliance status report are not agreed to by the landowner, gather additional information and/or provide the landowner with written procedures and a timeframe to pursue reconsideration of local decisions.
5. In circumstances where livestock facilities or cropping practices are not in compliance, assess the relative pollution threat associated with the noncompliance and make a determination regarding the allocation of staff and financial resources under Section 6 of this agreement.
6. Keep and maintain public records, as the custodial authority, following requirements of the Wisconsin Open Records Law.

7. Develop and maintain a geographically-based recordkeeping system and database to record the location where farm evaluations have been conducted and where compliance status reports have been issued. At a minimum, the database will contain the following information:
 - a. Location of parcel(s) evaluated as included in the compliance status report, recorded by Town, Range, Section and $\frac{1}{4}$ $\frac{1}{4}$ section.
 - b. Watershed where parcel is located
 - c. Owner of land at time of notification.
 - d. Date of compliance report.
 - e. Date compliance report mailed to landowner.
 - f. End date for landowner request of status report appeal or reconsideration.
 - g. Date of request for reconsideration of compliance report (if submitted).
 - h. Date letter mailed to landowner.

8. Upon completion of the process, record the compliance status of each livestock facility and cropping practice on the Chippewa County Track Index. The public documents to be formally recorded will be restricted to the following:
 - a. Public cost-share and stipulation agreements.
 - b. Letters of compliance issued to document that all standards and prohibitions specified under NR151 are met (Status Letter B).
 - c. Letters of compliance issued to document that select standards and prohibitions specified on a cost-share or stipulation agreement are met (Status Letter E).

9. Develop and maintain a GIS web-based index map showing:
 - a. The location of all tax parcels where compliance reports have been issued.
 - b. The locations where letters (Letter Type A, B) have been sent.
 - c. The date of the last revision.
 - d. The compliance status of the parcel.

10. Upon completion of the administrative process, issue and record a letter of compliance for each livestock facility and cropping practice, referenced to the appropriate tax parcel through the Chippewa County Track Index.

C. DNR will:

1. Co-sign Letter Types A and B in cases where it concurs with the County's findings.
2. Provide support to Chippewa County in explaining compliance determinations that DNR assisted in developing.

Via. Component 6A: Secure Funding and Technical Assistance

A. The parties agree:

1. Previous commitments for cost-share funding have been made through cost-share agreements signed under the Duncan Creek Priority Watershed Project.

2. Section 281.16(3), Wis. Stats., and sections NR151.09(3)(c), and NR151.095(4)(d) prohibit the State or municipalities from requiring that “existing” practices and facilities , which were not in compliance with the agricultural performance standards and prohibitions on the effective date of the rule, to come into compliance through State regulation or local ordinance unless public cost share funds are provided for eligible costs.
3. NR151.09(3) and NR151.095(4) identify compliance requirements for owners and operators of cropland practices and livestock facilities based on whether the practices and facilities determined to be “existing” or “new”, and whether cost sharing is required and made available to the landowner or operator.
4. NR151 defines cost share availability requirements for funding administered by DNR under 281.65, Stats. ATCP 50 defines cost-share availability from any other source. These requirements must be clearly understood to ensure that proper determinations of cost-share availability, are made by DNR and County staff.
5. Cost-share funds to pursue compliance are now available from a combination of public and private non-profit grant sources, including: the Duncan Creek Priority Watershed Project, the DATCP Soil and Water Management Program (SWRM), the DNR Targeted Runoff Management Program (TRM), USDA cost-share and land set-aside programs and nonprofit organizations.
6. Developing cost-share funding proposals and grant contracts from single or multiple grant sources, requires significant knowledge of multiple grant programs, administrative rules, and contracting requirements.

B. Chippewa County will:

1. In circumstances where a cost share contract in the Duncan Creek Priority Watershed has not been fully implemented and where nonpoint performance standards and prohibitions are currently met, offer the producer the option of pursuing the contract, as previously agreed to, or the option of amending the contract to remove conservation practices which are not necessary to achieve compliance. The County will remove practices only if consistent with the priority watershed plan.

Note: The option for removing contracted procedures will not be extended to “critical sites”, previously identified by DNR as necessary to meet watershed plan pollution reduction goals.

2. Through its fiscal policy and grants management strategy, reserve a portion of state cost-share funds available through the DATCP Land and Water grants program for applicants that participate in the Chippewa County Voluntary Farm Evaluation and Certification Program. These funds will be allocated where:
 - a. Croplands or livestock facilities that have not met the agricultural nonpoint standards and prohibitions since their effective dates; or

- b. Agricultural nonpoint standards are now met and where additional conservation practices will achieve significant public water quality benefits, including circumstances where:
 - i. the pollutant source has no applicable standard, or where
 - ii. the existing nonpoint standards are not adequate to meet the State water quality standards or management objective for the water body.
- 3. Through its fiscal policy and grants management strategy, reserve a portion of state cost-share funding through the DATCP Land and Water grants program for cropland practices and livestock facilities that choose to not voluntarily come into compliance with standards and prohibitions, as determined through an evaluation conducted in response to a public complaint or a request submitted by DNR.
- 4. Within the limits of State staffing grants, apply for additional cost-share funds available through the DNR TRM grant program to provide offers of cost-share to achieve compliance with NR 151.
- 5. Convey to the responsible USDA agencies (NRCS and FSA) the County's preference to prioritize and allocate a portion of Federal cost share funds to applicants that participate in the Chippewa County Voluntary Farm Evaluation Program that do not, as yet, fully meet the State's agricultural nonpoint performance standards and prohibitions.
- 6. Within the limits of State staffing grants, pursue new sources of local, state and federal funds for applicants that participate in the Chippewa County Voluntary Farm Evaluation Program if required to implement performance standards and prohibitions.
- 7. Evaluate the availability of County staff to implement NR151.09 and NR151.095, and allocate effort based upon the availability of State staffing grants and/or direct reimbursement provided by DNR and/or DATCP for the purpose of implementing agricultural performance standards and prohibitions.
- 8. Evaluate and allocate County staff toward implementation of NR151.09 and NR151.095, based upon the availability of State staffing grants and/or direct reimbursement provided by DNR and/or DATCP for the explicit purpose of implementing agricultural performance standards and prohibitions through NR151.09 and NR151.095.
- 9. Within the limits of State staffing grants, make staffing commitments necessary to support the installation of conservation practices.

C. DNR will:

- 1. Assist Chippewa County in determining what constitutes an adequate offer of cost sharing under s. 281.65, Stats and chapters NR 153 and NR 154.
- 2. Establish procedures with DATCP to confirm availability of cost-share funding from sources other than s. 281.65.

VIIb. Component 6B: Option to Issue Non-Voluntary NR151 Notice of Cost-Share

A. Parties Agree:

1. In nearly all circumstances, landowners will be willing and able to implement conservation practices on a voluntary basis as necessary to comply with performance standards and prohibitions. In some instances, a landowner may not be willing to do so.
2. Chapter NR 151.09 and NR 151.095 set forth notification requirements that must be met before DNR can initiate enforcement action under Ch. 281, Stats., for non-compliance with performance standards and prohibitions. This includes provision of a notification to the landowner at the time that cost sharing is made available, or in cases when cost share is not required, when the compliance achievement period starts.
3. Notification requirements and cost-share availability requirements vary depending upon the legal authority that is used to enforce the standards and the source of funding. These requirements are documented in Appendix A.
4. Developing and issuing notices of cost sharing under the non-voluntary NR151 option is a joint responsibility of Chippewa County and DNR.

B. Chippewa County will:

1. Within limits of State staffing grants, and with input from DNR regional staff, prepare draft landowner notifications under NR 151.09 (5-6) and NR 151.095 (6-7) using DNR templates (See Letter Types C and D, Appendix A).

Note: This includes situations where an existing cost share contract in the Duncan Creek Priority Watershed has not been implemented to meet nonpoint performance standards and prohibitions and where DNR and County staff determine the site is a high priority for issuing the notice.

2. Provide draft notices to DNR regional staff for completion and DNR signature.

C. DNR will:

1. Sign and issue notices (Appendix A, Letter Types C & D) to landowners under NR 151.09 and NR 151.095.

VII. Component 7. Administer Funding and Technical Assistance/Re-evaluate Parcel

A. The parties agree:

1. If public cost share funds are offered to install conservation practices, through either the voluntary or non-voluntary option, a cost share agreement must be developed and public funds must be accounted for.

2. Cost-share agreements have historically been developed by professional staff who have a working knowledge of administrative rules, contracting procedures, agronomy and agricultural engineering.
3. A “farm conservation planning process” has historically been used to:
 - a. Compile physical information which describes the production potential and limitations of agricultural land.
 - b. Document current management practices which are being used to manage the crop and livestock production.
 - c. Inform and educate landowners of conservation practices which are available to meet conservation objectives.
 - d. Document the location and scheduled implementation of conservation practices as a basis for cost share contract development.
4. A site evaluation and engineering process has historically been used to:
 - a. Inventory and evaluate sources of agricultural runoff and nonpoint pollution.
 - b. Identify management options and best management practices to control runoff.
 - c. Prepare cost estimates of the available management options as a basis for decision making and contracting.
 - d. Survey and design the selected management system.
 - e. Layout and supervise the construction of the runoff system.
 - f. Through post construction inspections, verify that the runoff system was constructed according to the design.
5. The successful completion of the conservation planning, contracting, and engineering process requires a broad range of skills and services in the fields of agronomy, engineering, and public administration.
6. The DNR, DATCP, and County have, through the Wisconsin Nonpoint Source Water Pollution Abatement Program and the Soil and Water Management Program, recruited, supported, and maintained a technical delivery staff with proven expertise in administering a nonpoint pollution abatement program for the purpose of meeting agricultural performance standards and prohibitions.

B. The County will:

1. Within the limits of state staffing grants, establish and administer a budget and accounting system to receive and disperse state funds administered by the County on behalf of the State.
2. Within the limits of state staffing grants, employ or contract professional staff for the purpose of developing and administering cost share contracts on behalf of state and federal agencies.

When administering state or local cost-share agreements, the agreement will stipulate (or will be accompanied by a separate stipulation agreement) that the affected cropland practices and livestock facilities will maintain or be brought into compliance with applicable performance standards and prohibitions, as enumerated in the compliance status report. These cost-share documents will be recorded.

The status of each cost-share agreement will be maintained as part of the geographic database and record keeping system described in Section V.B.6.

3. Within the limits of state staffing grants, employ or contract a certified agronomist or conservation planner, for the purpose of providing conservation planning services to landowners, or for the purpose of reviewing the adequacy of conservation plans prepared by private service providers or federal agency staff.
4. Within the limits of state staff grants, employ or contract a licensed engineer, for the purpose of providing engineering design services, assuring construction oversight and evaluating and certifying installation of conservation practices to meet the agricultural performance standards and prohibitions, or for the purpose of reviewing the adequacy of engineering designs, and evaluating and certifying installation of conservation practices through review of "as-built" surveys provided by third party service providers (private sector or USDA conservation delivery system).
5. In circumstances where conservation planning or engineering services are provided to the landowner as a reimbursable expense under the DNR TRM Program or USDA cost share programs account for conservation planning and engineering expenses and bill the landowner at a standardized hourly rate upon completion of the contracted practice.
6. Upon completion of best management practices implemented through the cost share agreement, conduct an onsite evaluation of the operation to document compliance with the agricultural nonpoint performance standards and prohibitions.
7. Provide to DNR a draft letter of satisfaction to be issued to the landowner (See Letter Type E, Appendix A). Record this compliance following procedures in Section IV and V of this agreement.
8. Within the limits of state staffing grants, conduct ongoing compliance monitoring through Operation and Management (O&M Plan) support.

C. The DNR will:

1. Provide direct reimbursement to the County for engineering services performed to design and install best management practices through the TRM grant program.
2. With DATCP, seek to secure sources of funding to reimburse the County for its administrative and technical services.
3. Within the limits of available funding, conduct program reviews to verify that cost share funding and conservation services have been administered in accordance with appropriate state administrative rules.
4. Sign and mail satisfaction letters to landowners.

VIII. Component 8: Enforcement

A. The parties agree:

1. DNR and Chippewa County will use voluntary means, to the extent practical, to achieve compliance with performance standards and prohibitions, but may use enforcement when necessary to meet requirements of ch. 281, Stats., and NR151.
2. Each party has independent authority to enforce standards and reserves the right to exercise that authority without permission of the other.
3. To be effective, the public and affected landowners must perceive enforcement as a necessary option, pursued jointly by the parties, after voluntary measures to achieve compliance have failed.
4. Chippewa County has authority to enforce the performance standards and prohibitions under s. 281.16, Stats., but has chosen not to do so at this time.
5. DNR has authority to enforce performance standards and prohibitions through a number of statutory options. These include, but are not limited to:
 - a. Referral by DNR to the Wisconsin Department of Justice to seek relief under s. 281.98, Wis. Stats.,
 - b. Use of enforcement procedures under NR 243 and s. 283.89, Stats., to obtain compliance with performance standards and prohibitions or to resolve a water quality problem.
 - c. Use of other state laws, including citation authority under s. 29.601, Wis. Stats.
6. To be effective, enforcement procedures must be well coordinated between DNR and Chippewa County, and must be supported by both parties.
7. NR 151.09 and NR 151.095 establish the procedures that must be followed as pre-requisites to enforcement when DNR funds are used or when DNR pursues enforcement under s. 281.98, Wis. Stats.
8. The start of formal enforcement procedures are recognized to begin with the issuance of a Notice of Violation. Grounds for issuing a Notice of Violation letter is non-compliance by the landowner or operator with the notice issued under NR 151.09(5), NR 151.09(6), NR 151.095(6), or NR 151.095(7) and Component 6 of this agreement.

B. Chippewa County Will:

1. Support DNR's lead role in enforcement.
2. Identify cases where landowners do not follow the requirements of their noncompliance notices and provide this information to the DNR.
3. Participate in DNR enforcement conferences.

4. Provide background information to DNR needed for WPDES permits or to develop referral packages to the Wisconsin Department of Justice.
5. Provide testimony, documents or other technical support for enforcement cases.
6. In circumstances where the County has issued permits or is pursuing legal actions under other authority, ensure that appropriate information concerning those permits or enforcement activity is transmitted to DNR.

C. DNR will:

1. Take the lead role in initiating enforcement action, including issuing notices of violation.
2. Ensure that appropriate information concerning enforcement activity by the Department is transmitted to the County.
3. Schedule and conduct enforcement conferences if appropriate.
4. If a point source discharge exists, issue a WPDES permit or take enforcement action under NR 243 and ch. 283, Stats., if consistent with regional and statewide permitting priorities.
5. Determine compliance with permits if consistent with regional and statewide compliance activities.
6. Prepare referral packages to Attorney General's Office if non-compliance continues and referral is approved by the DNR Secretary's Office.

IX. Component 9. Ongoing Compliance Monitoring

A. The parties agree:

1. NR151.09(3)(b) and NR151.095(4)(b) require that existing cropland practices and livestock facilities, which are in compliance on or after October 1, 2002, remain in compliance without the offer of cost share.
2. Ongoing agricultural operations are dynamic in nature and continually change in response to market forces, changes in technology, and changes in land ownership.
3. Periodic evaluations are of direct value to current owners and operators, as they make routine business decisions which affect their agricultural operation, including those related to capital investments, land rental, and land sales.
4. Routine compliance monitoring is of direct value to the general public as a way to verify that compliance is maintained..

B. Chippewa County will:

1. For those operations that have received a letter indicating compliance (Appendix A, Letter Type A, B or E), implement a system of routine compliance monitoring. The extent of monitoring will be directly proportional to the amount of State funding allocated specifically to support this effort.
2. Under the monitoring system:
 - a. Conduct an annual reporting and self-certification program for operations that have an active State cost share contract subject to a 10 year Operation and Maintenance Plan.
 - b. Conduct an annual educational mailing in association with the annual property tax billing for operations that are in compliance, but no longer subject to provisions of an active operation and maintenance plan.
3. Assume a lead role in responding to public complaints following protocol for compliant response, procedures for site evaluation, and determinations as established in Sections 4 and 5 of this agreement.

X. Component 10: Annual Reporting

A. The parties agree:

1. Annual reports can be used track progress toward implementing the NR151 agricultural nonpoint performance standards and prohibitions.
2. The information contained in an annual report must be systematically collected and be readily available from the County's record-keeping system.
3. DNR will work with DATCP to collect information which can be compiled into an annual State-wide report to document the status of program implementation.
4. To assure that the appropriate information is gathered, the State agencies must define, in advance, what information each agency intends to request in order to monitor the status of program implementation, and the extent to which the standards have been applied

B. Chippewa County will:

1. By April 15 of each year, summarize and report to DNR information that summarizes the general compliance status of livestock facilities and cropland in the County. Information will be conveyed on reporting forms provided by DNR.

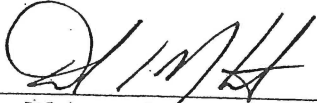
Note: Starting in 2005, NR 151 performance standards/prohibitions reporting form will be combined with LWRM reporting form.

2. The report will be augmented by a map that will show the cumulative location of cropland parcels and livestock operations which have been evaluated, and the associated compliance status of these lands and operations.

3. Compile the County data from the report into a state-wide report to be presented to the Land and Water Conservation Board, DNR Board, Agricultural Board, Wisconsin Legislature, and other interested parties.

Note: DNR intends to develop this report jointly with DATCP.

Signatures



Dan Masterpole, County Conservationist
Chippewa County Land Conservation Department

4/26/04
date



Chair, Duane Boettcher
Chippewa County Land Conservation Committee

4/29/04
date



John Paddock, Lower Chippewa Basin Leader
Wisconsin Department of Natural Resources

4/26/04
date



Russ Rasmussen, Runoff Management Section Chief
Wisconsin Department of Natural Resources

4/21/04
date

C. DNR will:

1. Develop an annual reporting form by which Counties will report the extent of confirmed compliance and the remaining workload to complete site evaluations to determine compliance.

Note: Information in the annual report is anticipated to include the following, summarized by county, watershed and performance standard/prohibition: total number of fields and facilities (estimate); portion of total that has been assessed (estimate); number of fields and facilities assessed (actual); number of assessed fields and facilities that are in compliance (actual); portion of assessed fields and facilities that are in compliance (actual).

2. Provide the form electronically to the County at least 2 months prior to the deadline for conveyance to DNR

3. Compile the County data from the report into a state-wide report to be presented to the Land and Water Conservation Board, DNR Board, Agricultural Board, Wisconsin Legislature, and other interested parties.

Note: DNR intends to develop this report jointly with DATCP.

Component 4A: Determine Current Compliance; Records Inventory

Signatures

Dan Masterpole, County Conservationist
Chippewa County Land Conservation Department

date

Chair
Chippewa County Land Conservation Committee

date

John Paddock, Lower Chippewa Basin Leader
Wisconsin Department of Natural Resources

date

Russ Rasmussen, Runoff Management Section Chief
Wisconsin Department of Natural Resources

date

Amendment to Component 8 of:
Memorandum of Understanding between Chippewa County and the Department of Natural Resources for the Implementation of the Agricultural Performance Standards and Prohibitions under NR151,
Dated April 26, 2004

This is an Amendment to Component 8 of the Memorandum of Understanding (MOU) between Chippewa County and the Department of Natural Resources (DNR) for implementation of the Agricultural Performance Standards and Prohibitions under NR151.

This amendment has been drafted to clarify the DNR and the County authorities and responsibilities for enforcement of the Agricultural Performance Standards and Prohibitions. The existing language, "*The County has authority to enforce performance standards and prohibitions under s. 281.16, Stats., but has chosen not to do so at this time.*", could be interpreted to mean that the County does not intend to enforce local ordinances that require compliance with the performance standards. For example, Chippewa County's Animal Waste Management ordinance requires new facilities to meet NRCS 313, which also meets the performance standards for new construction and alterations of manure storage facilities (see NR 151.05(2)).

The language changes in the Amendment to Component 8 clarify that the County will enforce the performance standards and prohibitions where local ordinances provide them the authority to do so. The DNR will take the lead role in initiating enforcement action for cropland practices and livestock facilities that are not covered by County ordinances, including issuing notices of violation.

Chippewa County MOU Amendment to Component 8

Component 8: Enforcement

The parties agree:

1. DNR and Chippewa County will use voluntary means, to the extent practical, to achieve compliance with performance standards and prohibitions, but may use enforcement when necessary to meet requirements of ch. 281, Stats., and NR151.
2. Each party has independent authority to enforce standards and reserves the right to exercise that authority without permission of the other.
3. To be effective, the public and affected landowners must perceive enforcement as a necessary option, pursued jointly by the parties, after voluntary measures to achieve compliance have failed.
4. The County has authority to enforce performance standards and prohibitions through local ordinances. The County will rely on DNR to use the state's enforcement authority for cropland practices and livestock facilities that are not covered by local ordinances.
5. DNR has authority to enforce performance standards and prohibitions through a number of statutory options. These include, but are not limited to:
 - a. Referral by DNR to the Wisconsin Department of Justice to seek relief under s.281.98, Wis. Stats.

- b. Use of enforcement procedures under NR 243 and s. 283.89, Stats., to obtain compliance with performance standards and prohibitions or to resolve a water quality problem.
 - c. Use of other state laws, including citation authority under s. 29.601, Wis. Stats.
6. To be effective, enforcement procedures must be well-coordinated and documented between DNR and Chippewa County, and must be supported by both parties.
 7. NR 151.09 and NR 151.095 establish the procedures that must be followed as prerequisites to enforcement when DNR funds are used or when DNR pursues enforcement under s. 281.98, Wis. Stats.
 8. Formal enforcement procedures will generally begin with the issuance of a Notice of Violation. Grounds for issuing a Notice of Violation letter is non-compliance by the landowner or operator with the notice issued under NR 151.09(5), NR 151.09(6), NR 151.095(6), or NR 151.095(7) and as spelled out in Components 6a and 6b of this agreement.

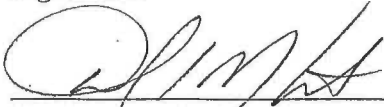
Chippewa County will:

1. Enforce the performance standards and prohibitions contained within its local ordinances, and support DNR's lead role in enforcing standards and prohibitions at sites that are not covered by County ordinances.
2. Identify cases where landowners do not follow the requirements of their noncompliance notices and provide this information to the DNR.
3. Participate in DNR enforcement conferences.
4. Provide background information to DNR needed for WPDES permits or to develop referral packages to the Wisconsin Department of Justice.
5. Provide testimony, documents or other technical support for enforcement cases.
6. In circumstances where the County has issued permits or is pursuing legal actions under other authority, ensure that appropriate information concerning those permits or enforcement activity is transmitted to DNR.

DNR will:

1. Take the lead role in initiating enforcement action for cropland practices and livestock facilities that are not covered by County ordinances, including issuing notices of violation.
2. Ensure that appropriate information concerning enforcement activity by the Department is transmitted to the County.
3. Schedule and conduct enforcement conferences if appropriate.
4. If a point source discharge exists, issue a WPDES permit or take enforcement action under NR 243 and ch. 283, Stats., if consistent with regional and statewide permitting priorities.
5. Determine compliance with permits if consistent with regional and statewide compliance activities.
6. Prepare referral packages to Attorney General's Office if non-compliance continues and referral is approved by the DNR Secretary's Office.

Signatures



Dan Masterpole, County Conservationist,
Chippewa County Land Conservation Department

7/20/07
date



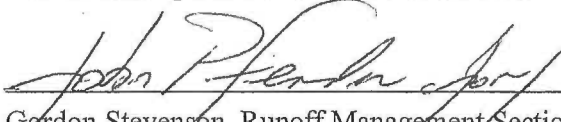
Paul Michels, Chair,
Chippewa County Land Conservation Committee

7/20/07
date



Daniel Baumann, West Central Region Water Leader,
Wisconsin Department of Natural Resources

7/27/07
date



Gordon Stevenson, Runoff Management Section Chief,
Wisconsin Department of Natural Resources

8/9/07
date

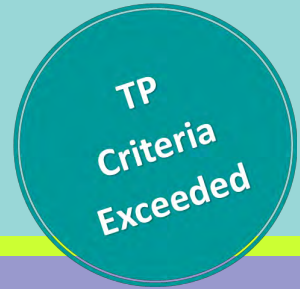
Appendix 6

Water Action Volunteers

2019 Nutrient Monitoring Program

Little Drywood Creek - Hwy O [1]

Monitored by Lake Wissota Stewardship Project

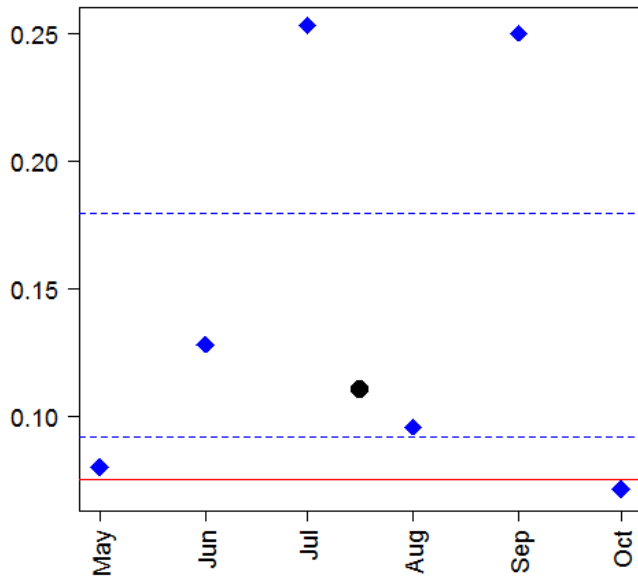


Monitoring Station Quick Facts

Station Quick Facts		Phosphorus Data Summary (mg/l)	
Water Body	Little Drywood Creek	High Range Confidence Limit	0.1794
SWIMS Station ID	10008667	Median P Concentration	0.1107
WBIC	2155100	Low Range Confidence Limit	0.0915
County	Chippewa	Maximum Value	0.253
Watershed	Lower Yellow (Chippewa Co.) River	Minimum value	0.0714



Monthly Phosphorus Concentration (mg/L)



- ◆ Monthly Result
- ◆ Median
- - High Range Confidence Limit
- State Standard
- - Low Range Confidence Limit

Why Phosphorus?

Phosphorus is an essential nutrient responsible for plant growth, but it is also the most visible, widespread water pollutant in lakes. Small increases in phosphorus levels can bring about substantial increases in aquatic plant and algae growth, which in turn can reduce the recreational use and biodiversity. When the excess plants die and are decomposed, oxygen levels in the water drop dramatically which can lead to fish kills. Additionally, one of the most common impairments in Wisconsin's streams is excess sediment that covers stream bottoms. Since phosphorus moves attached to sediments, it is intimately connected with this source of pollution in our streams. Phosphorus originates naturally from rocks, but its major sources in streams and lakes today are usually associated with human activities: soil erosion, human and animal wastes, septic systems, and runoff from farmland or lawns. Phosphorus-containing contaminants from urban streets and parking lots such as food waste, detergents, and paper products are also potential sources of phosphorus pollution from the surrounding landscape. The impact that phosphorus can have in streams is less apparent than in lakes due to the overall movement of water, but in areas with low velocity, where sediment can settle and deposit along the bottom substrate, algae blooms can result.

Volunteer Monitoring Protocol

To assess in-stream phosphorus levels, WAV volunteers collected water samples that were analyzed for total phosphorus (TP) at the State Lab of Hygiene during the growing season. Following Wisconsin Department of Natural Resources (WDNR) methods, four to six phosphorus water samples were collected at each monitoring site - one per month for up to each of the six months during the growing season. The monthly water samples were collected approximately 30 days apart and no samples were collected within 15 days of one another. Samples at several sites were collected every two weeks. The monthly values are an average of the biweekly sample results.



Photos by Cynthia Alf and Marilyn Starzewski



A stream site is considered "Criteria Exceeded" if: 1) the lower 90% confidence limit of the sample median exceeds the state TP criterion of 0.075 mg/L or 0.1 mg/L or 2) there is corroborating WDNR biological data to support an adverse response in the fish or macroinvertebrate communities. If there is insufficient data for either of these requirements, more data will need to be collected in subsequent years before a decision can be made. A site is designated as "Watch Waters" if the median total phosphorus concentration falls within the confidence limit or additional data are required, and a site is considered to have "Met Criteria" if the upper limit of the confidence interval does not exceed the criterion.

PROJECT PARTNERS

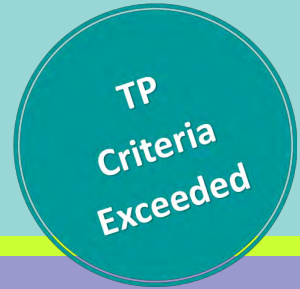


Water Action Volunteers

2019 Nutrient Monitoring Program

Little Drywood Creek at CTH S

Monitored by Lake Wissota Stewardship Project

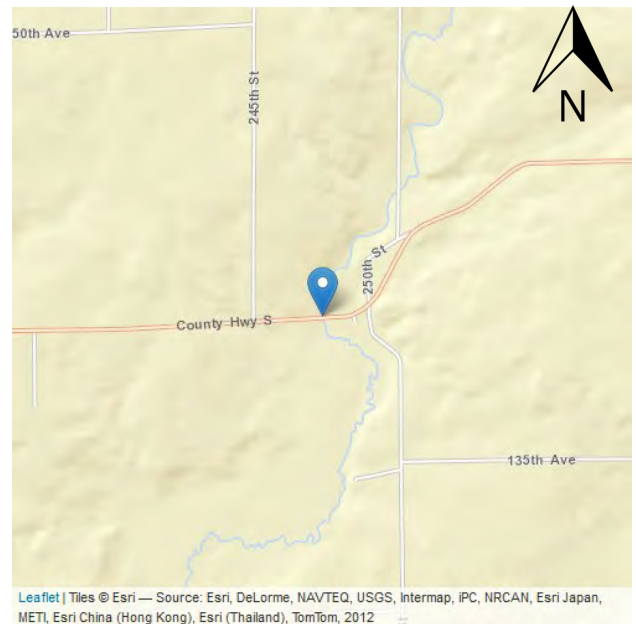
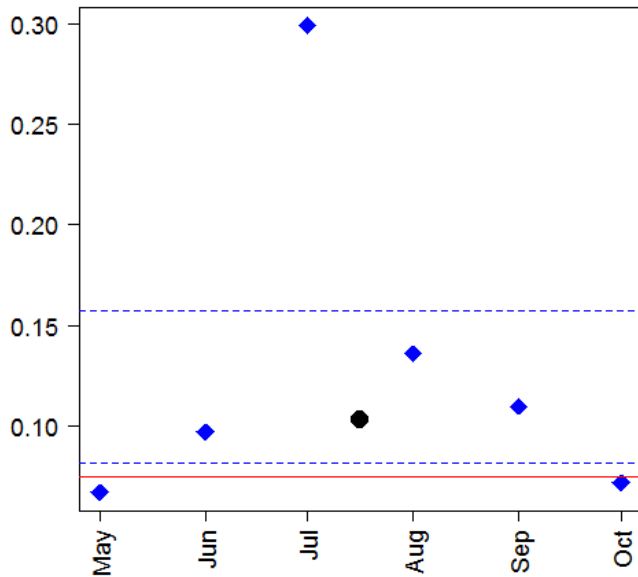


Monitoring Station Quick Facts

Station Quick Facts		Phosphorus Data Summary (mg/l)	
Water Body	Little Drywood Creek	High Range Confidence Limit	0.1571
SWIMS Station ID	10050069	Median P Concentration	0.1035
WBIC	2155100	Low Range Confidence Limit	0.0816
County	Chippewa	Maximum Value	0.299
Watershed	Lower Yellow (Chippewa Co.) River	Minimum value	0.0672



Monthly Phosphorus Concentration (mg/L)



- ◆ Monthly Result
- ◆ Median
- - - High Range Confidence Limit
- State Standard
- - - Low Range Confidence Limit

Why Phosphorus?

Phosphorus is an essential nutrient responsible for plant growth, but it is also the most visible, widespread water pollutant in lakes. Small increases in phosphorus levels can bring about substantial increases in aquatic plant and algae growth, which in turn can reduce the recreational use and biodiversity. When the excess plants die and are decomposed, oxygen levels in the water drop dramatically which can lead to fish kills. Additionally, one of the most common impairments in Wisconsin's streams is excess sediment that covers stream bottoms. Since phosphorus moves attached to sediments, it is intimately connected with this source of pollution in our streams. Phosphorus originates naturally from rocks, but its major sources in streams and lakes today are usually associated with human activities: soil erosion, human and animal wastes, septic systems, and runoff from farmland or lawns. Phosphorus-containing contaminants from urban streets and parking lots such as food waste, detergents, and paper products are also potential sources of phosphorus pollution from the surrounding landscape. The impact that phosphorus can have in streams is less apparent than in lakes due to the overall movement of water, but in areas with low velocity, where sediment can settle and deposit along the bottom substrate, algae blooms can result.

Volunteer Monitoring Protocol

To assess in-stream phosphorus levels, WAV volunteers collected water samples that were analyzed for total phosphorus (TP) at the State Lab of Hygiene during the growing season. Following Wisconsin Department of Natural Resources (WDNR) methods, four to six phosphorus water samples were collected at each monitoring site - one per month for up to each of the six months during the growing season. The monthly water samples were collected approximately 30 days apart and no samples were collected within 15 days of one another. Samples at several sites were collected every two weeks. The monthly values are an average of the biweekly sample results.



Photos by Cynthia Alf and Marilyn Starzewski



A stream site is considered "Criteria Exceeded" if: 1) the lower 90% confidence limit of the sample median exceeds the state TP criterion of 0.075 mg/L or 0.1 mg/L or 2) there is corroborating WDNR biological data to support an adverse response in the fish or macroinvertebrate communities. If there is insufficient data for either of these requirements, more data will need to be collected in subsequent years before a decision can be made. A site is designated as "Watch Waters" if the median total phosphorus concentration falls within the confidence limit or additional data are required, and a site is considered to have "Met Criteria" if the upper limit of the confidence interval does not exceed the criterion.

PROJECT PARTNERS

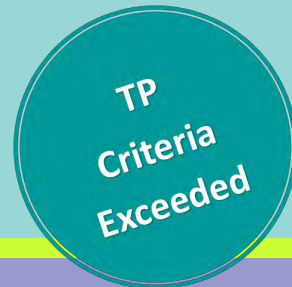


Water Action Volunteers

2019 Nutrient Monitoring Program

1-Big Drywood Creek - Hwy O [1]

Monitored by Lake Wissota Stewardship Project



Monitoring Station Quick Facts

Station Quick Facts

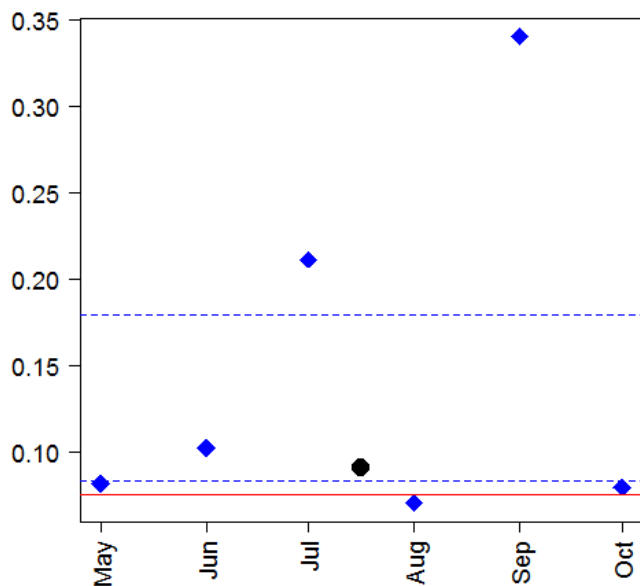
Water Body	Big Drywood Creek
SWIMS Station ID	10008671
WBIC	2154800
County	Chippewa
Watershed	Lower Yellow (Chippewa Co.) River

Phosphorus Data Summary

High Range Confidence Limit	0.1795
Median P Concentration	0.0912
Low Range Confidence Limit	0.0832
Maximum Value	0.34
Minimum value	0.0702



Monthly Phosphorus Concentration (mg/L)



◆ Monthly Result
◆ Median

--- High Range Confidence Limit
— State Standard
--- Low Range Confidence Limit

Why Phosphorus?

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Photos by Cynthia Alf and Marilyn Starzewski



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PROJECT PARTNERS

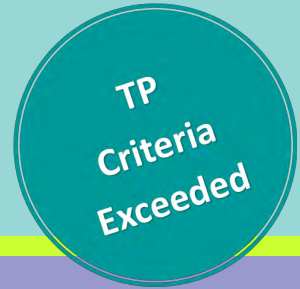


Water Action Volunteers

2019 Nutrient Monitoring Program

5 - Big Drywood Creek - 250th St

Monitored by Lake Wissota Stewardship Project

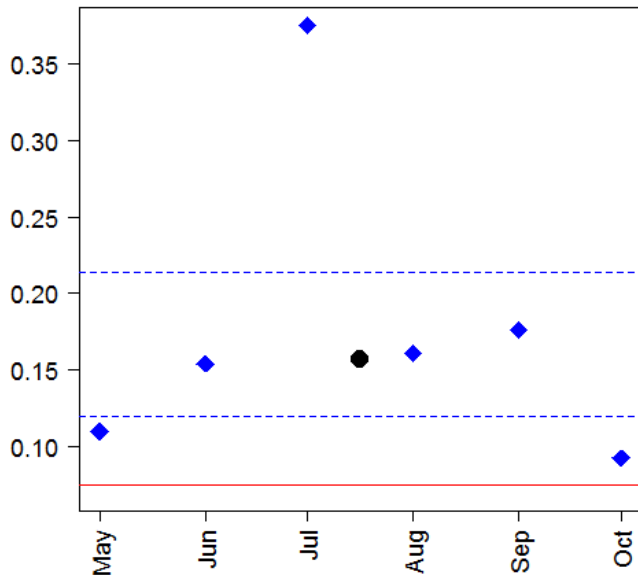


Monitoring Station Quick Facts

Station Quick Facts		Phosphorus Data Summary (mg/l)	
Water Body	Big Drywood Creek	High Range Confidence Limit	0.214
SWIMS Station ID	10008672	Median P Concentration	0.1575
WBIC	2154800	Low Range Confidence Limit	0.1193
County	Chippewa	Maximum Value	0.375
Watershed	Lower Yellow (Chippewa Co.) River	Minimum value	0.0924



Monthly Phosphorus Concentration (mg/L)



- ◆ Monthly Result
- ◆ Median
- - - High Range Confidence Limit
- State Standard
- - - Low Range Confidence Limit

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Photos by Cynthia Alf and Marilyn Starzewski



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PROJECT PARTNERS



Water Action Volunteers

2018 Nutrient Monitoring Program

Little Drywood Creek at CTH S

Monitored by Lake Wissota Stewardship Project

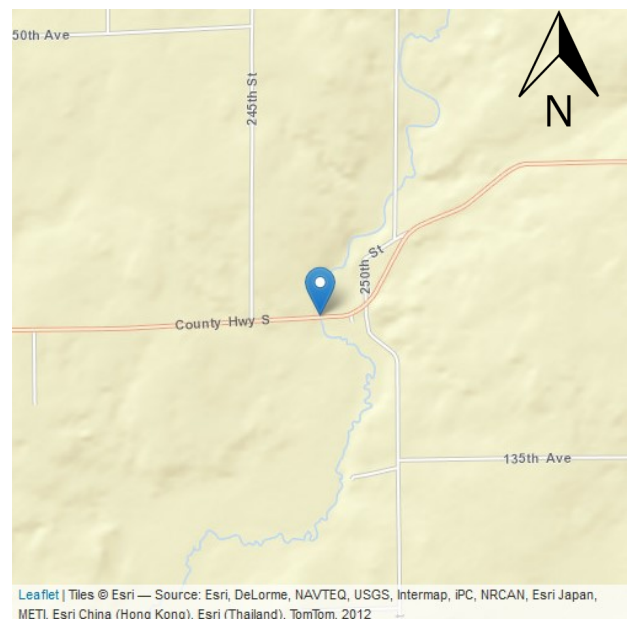
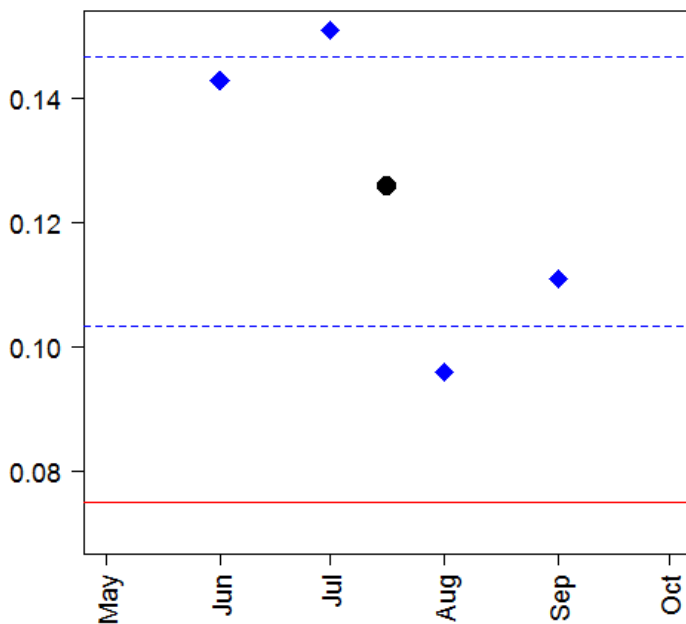


Monitoring Station Quick Facts

Station Quick Facts		Phosphorus Data Summary (mg/l)	
Water Body	Little Drywood Creek	High Range Confidence Limit	0.147
SWIMS Station ID	10050069	Median P Concentration	0.126
WBIC	2155100	Low Range Confidence Limit	0.103
County	Chippewa	Maximum Value	0.151
Watershed	Lower Yellow (Chippewa Co.) River	Minimum value	0.096



Monthly Phosphorus Concentration (mg/L)



Leaflet | Tiles © Esri — Source: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

- ◆ Monthly Result
- ◆ Median
- - - High Range Confidence Limit
- State Standard
- - - Low Range Confidence Limit

Why Phosphorus?

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Photos by Cynthia Alf and Marilyn Starzewski



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PROJECT PARTNERS



Water Action Volunteers

2018 Nutrient Monitoring Program

Little Drywood Creek - Hwy O [1]

Monitored by Lake Wissota Stewardship Project

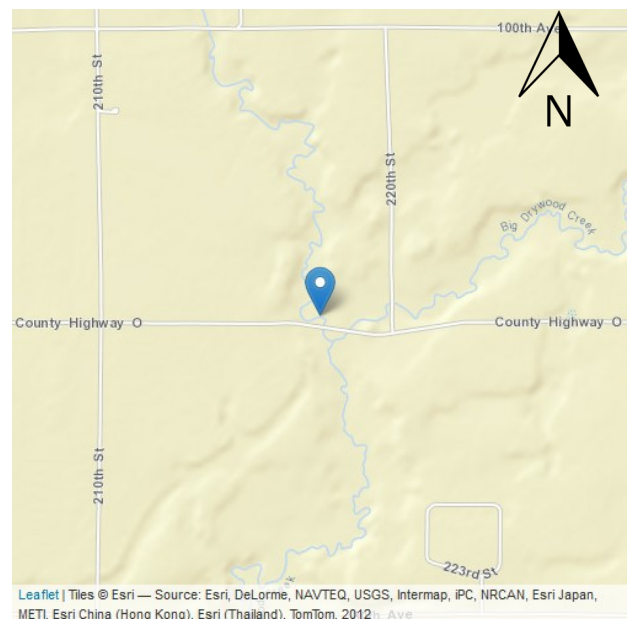
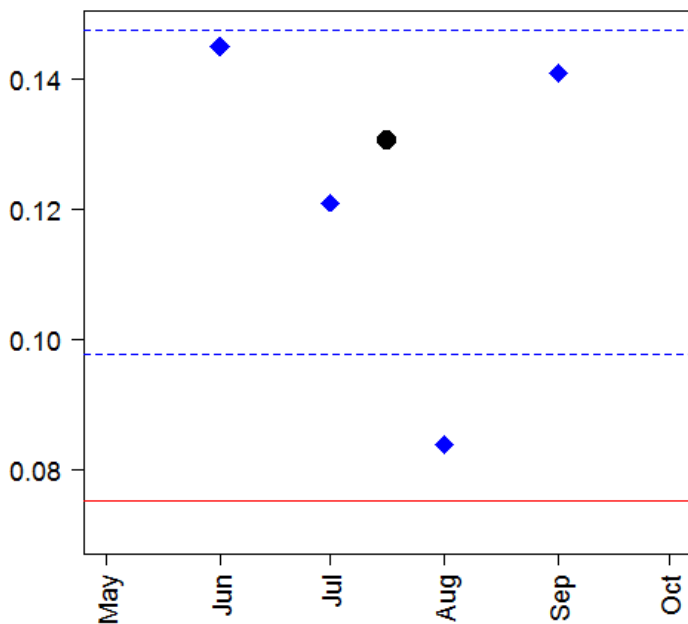


Monitoring Station Quick Facts

Station Quick Facts		Phosphorus Data Summary (mg/l)	
Water Body	Little Drywood Creek	High Range Confidence Limit	0.148
SWIMS Station ID	10008667	Median P Concentration	0.131
WBIC	2155100	Low Range Confidence Limit	0.098
County	Chippewa	Maximum Value	0.145
Watershed	Lower Yellow (Chippewa Co.) River	Minimum value	0.084



Monthly Phosphorus Concentration (mg/L)



- ◆ Monthly Result
- ◆ Median
- - - High Range Confidence Limit
- State Standard
- - - Low Range Confidence Limit

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PROJECT PARTNERS



Water Action Volunteers

2018 Nutrient Monitoring Program

1-Big Drywood Creek - Hwy O [1]

Monitored by Lake Wissota Stewardship Project

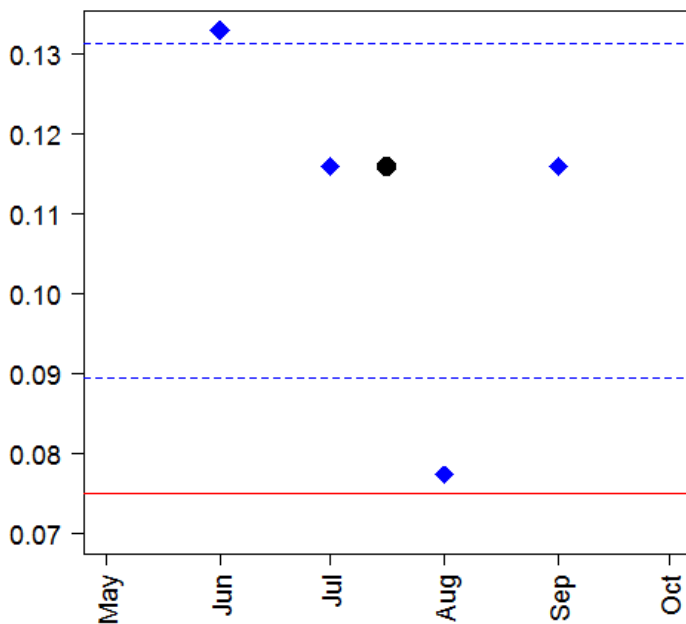


Monitoring Station Quick Facts

Station Quick Facts		Phosphorus Data Summary (mg/l)	
Water Body	Big Drywood Creek	High Range Confidence Limit	0.131
SWIMS Station ID	10008671	Median P Concentration	0.116
WBIC	2154800	Low Range Confidence Limit	0.09
County	Chippewa	Maximum Value	0.133
Watershed	Lower Yellow (Chippewa Co.) River	Minimum value	0.077



Monthly Phosphorus Concentration (mg/L)



- ◆ Monthly Result
- ◆ Median
- - - High Range Confidence Limit
- State Standard
- - - Low Range Confidence Limit

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PROJECT PARTNERS



Water Action Volunteers

2018 Nutrient Monitoring Program

5 - Big Drywood Creek - 250th St

Monitored by Lake Wissota Stewardship Project

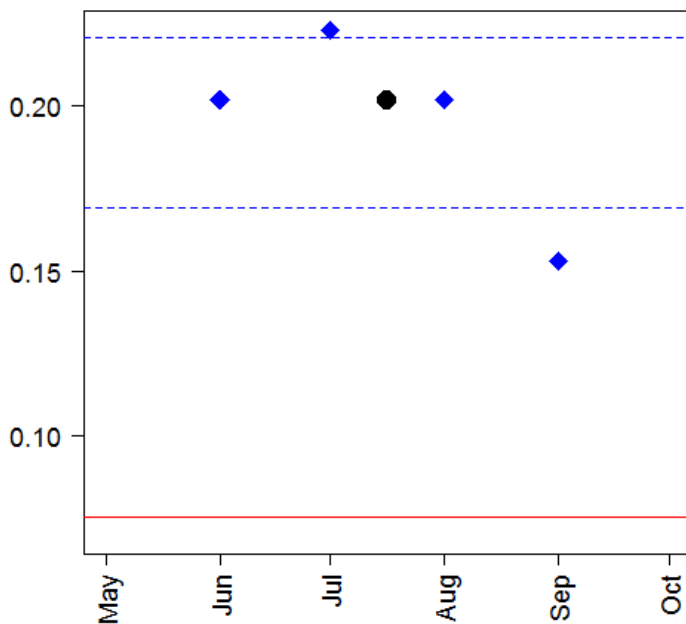


Monitoring Station Quick Facts

Station Quick Facts		Phosphorus Data Summary (mg/l)	
Water Body	Big Drywood Creek	High Range Confidence Limit	0.221
SWIMS Station ID	10008672	Median P Concentration	0.202
WBIC	2154800	Low Range Confidence Limit	0.169
County	Chippewa	Maximum Value	0.223
Watershed	Lower Yellow (Chippewa Co.) River	Minimum value	0.153



Monthly Phosphorus Concentration (mg/L)



- ◆ Monthly Result
- ◆ Median
- - - High Range Confidence Limit
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PROJECT PARTNERS



Appendix 7

meyer.environmental.wi@gmail.com

From: Craig, Andrew D - DNR <Andrew.Craig@wisconsin.gov>
Sent: Monday, November 15, 2021 12:45 PM
To: meyer.environmental.wi@gmail.com; Masterpole, D - DATCP
Cc: Oldenburg, Patrick S - DNR; Willger, Christopher J - DNR; Lepsch, Jodi A - DNR; Usborne, Elizabeth L - DNR; Gesch, Karl R - DNR; Person, Ruth A - DNR; Hoeft, Renee L - DNR; Johnson, Corinne L - DNR; Clayton, Christopher R - DNR; Griffin, Joanna D - DNR; Chancellor, Sandra D - DNR; DANIEL P ZERR; Trumble, Lisa K - DATCP; Matt; Hazuga, Mark J - DNR; Searle, Greg - DNR; Geisenhoffer, Colin (geisenhoffer.colin@epa.gov)
Subject: WDNR determination that Yellow River-Moon Bay watershed based plan is consistent with 9 Elements - 11-15-2021
Attachments: DNRReviewComments-YRMB-9EP-11-15-2021.pdf

Caleb Meyer, Dan Masterpole (and others):

After completing review of the revised Yellow River-Moon Bay watershed-based plan today (Nov 15), we are pleased to confirm the plan is now consistent with EPA's nine key elements. Congratulations.

DNR element by element review comments for the plan are attached here:

The six HUC 12 watersheds, shown within map below, are now eligible for grants using federal section 319 funds.

We are committed to service excellence.

Visit our survey at <http://dnr.wi.gov/customersurvey> to evaluate how I did.

Andrew Craig

(pronouns: he/him/his)

Nonpoint Source Watershed Planning Coordinator

Bureau of Watershed Management - Division of External Services

Wisconsin Department of Natural Resources

Office Phone: (608) 267-7695

Mobile Phone: (608) 630-2172

Andrew.Craig@wisconsin.gov

Plan Name: *Yellow River – 9 Key Element Plan for Lower Yellow River Watershed and Moon Bay, Lake Wissota*

Plan Date: *November 2021*

Watershed HUC: Lotz Creek Watershed (HUC12 070500050305)
Big Drywood Watershed (HUC12 070500050304)
Little Drywood Watershed (HUC12 070500050303)
Pike Creek Watershed (HUC12 070500050301)
Otter Creek Watershed (HUC12 070500050302)
Lake Wissota Watershed (HUC12 070500050308)

This plan prioritizes the six HUC 12's listed above for implementation, using multiple criteria. That priority order is shown above.

Moon Bay was assessed by Wisconsin DNR and listed in 2016 separately for phosphorus related impairments. The summer mean phosphorus in Moon Bay is 106 µg/L with a mean chlorophyll of 41 µg/L. This plan compliments and aligns geographically with the Little Lake Wissota 9 Key Element watershed-based plan that was approved in 2019. Although Moon Bay does not have an approved TMDL for TP like Little Lake Wissota, the watershed has been evaluated by DNR and has clearly defined water quality goals and pollution load reductions (i.e., reduce to Moon Bay to 49 ug/L TP; achieve 30% or fewer summer days with chlorophyll > 20 ug/L) necessary to meet those goals that will help restore Moon Bay's beneficial uses (full body contact – swimming – and boating) in the summer months.

- 1. Identification of causes of impairment and pollutant sources or groups of similar sources that need to be controlled to achieve the load reductions in this plan (and any other goals identified in the watershed based plan).** Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., X number of dairy cattle feedlots needing upgrading, including rough estimate of number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control).

Plan meets this requirement:

Pages 1-16, 23-38, 53-57 and a DNR 2018 memo, described in plan and attached below, reflect element 1 criteria. The plan describes how the Yellow River sub-watersheds are a major tributary to Moon Bay and its water quality. Land use and land cover in the watershed is primarily a mix of dairy operations, including CAFO spreading fields, cash grain operations, deciduous forest, and wetland. Accordingly, the plan identifies agricultural lands as a primary nonpoint pollution source that needs reduction to improve water quality in stream tributaries and Moon Bay, over time. Agricultural sources that need to be controlled are identified at the significant subcategory level (e.g., dairy and cash grain cropland; feedlots with higher risk for direct discharges to surface waters; cropland acres with and without nutrient management plans) with estimates of the extent to which they are present in them five HUC 12 sub-watersheds.



Moon Bay Goals.pdf

The plan describes changes in land cover and land use will directly influence associated pollutant loading to Moon Bay. Based on agriculture projections and statistics in the last ten years by Chippewa County Land Conservation Department, there is an ongoing trend in small dairy operations, that use perennial pastures, transitioning to larger dairy and cash grain operations (that primarily use annual based crops and tillage). Agricultural trends such as these have increased cropland soil erosion, nutrient applications, and corresponding phosphorus loss to surface waters, via runoff, in the watershed. These factors, in turn, will place a further strain on area water resources and create increased non-point source impacts to the Yellow River and Lake Wissota.

The plan also describes land inventories in the watershed have revealed approximately half of agricultural land is operated by its owner and half of agricultural land is leased to large scale cash crop operations. Much agricultural land in some HUC 12 sub-watersheds is often leased by producers using short term 1–3-year contracts. *This trend in leasing land may be a critical factor that limits plan implementation; land use inventories should be repeated every 2-3 years over the plans 20 year schedule.*

Plan does not meet this requirement. The following information is required:

2. **An estimate of load reductions expected for the recommended management measures described in item 3 (below).** Estimates should be provided at the same level as in item 1 above (e.g., total load reduction expected for dairy cattle feedlots or acres of row crops under improved nutrient management or sediment control).

Plan meets this requirement:

Pages 17-24, 36-50 and 53-57 of plan are close to meeting element 2 criteria. The plan uses the 2018 Wisconsin Department of Natural Resources memo as the primary basis for its load reduction goals. The memo estimates the total phosphorus load to Moon Bay is approximately 70,535 lbs/year and a 54% reduction in the watershed phosphorus load is necessary to reduce to Moon Bay to 49 ug/L TP and achieve 30% or fewer summer days with chlorophyll > 20 ug/L. Pages 53-57 of plan also contain an estimate of current pollutant loading from each HUC 12 sub-basin using DNR's PRESTO tool. When combined, PRESTO cumulative loading from the five HUC 12's is estimated at 64,000 lbs/P/year.

STEPL modeling for current and future pollutant loads within each the five HUC 12 sub-watersheds was completed in consultation with WDNR staff in the spring of 2020. The modeling results help define watershed existing pollutant loads and critical areas for practices within each HUC 12 sub-watershed. The existing pollutant load for the entire watershed is estimated to be 90,969 total lbs TP/yr.

The plan applies the WDNR derived 54% total phosphorus load reduction goal to the STEPL derived pollutant loads for existing conditions and management practices in the watershed. STEPL model results (pages 48-50) in plan reveal approximately 50% of total cropland acres and at least 75% of total feedlot operations within each the five HUC 12 sub-watersheds will need new or additional management cropland and feedlot-based practices to achieve a 50% reduction, which nearly meets the plans 54% TP reduction goal. All modeled load reduction estimates contain some level of uncertainty and include a margin of error. Because the this plan is within 5% of the 54% reduction goal, the reduction estimates likely fall within this margin of error.

Pages 19-20 of plan describes how the five HUC 12 sub-watersheds were prioritized for implementation of cropland and feedlot-based practices . The ranking of the HUC 12s uses STEPL derived TP and Sediment loading rates for each HUC 12, extent of ag acres and feedlots, level of existing compliance with NR 151 performance standards, density of cropland with high erosion risk, and landowner cooperation factors). *Prioritizing plan implementation efforts by HUC 12 will be critical for successful plan implementation.*

Plan does not meet this requirement. The following information is required:

- 3. Description of the NPS management measures that will need to be implemented to achieve load reductions in item 2, and identification (using a map or description) of the critical areas in which those measures will be needed to implement the plan.**

Plan meets this requirement:

Pages 19-23 and 25-32 describe the cropland or feedlot-based practices that will be used to meet the plan’s 54% TP load reduction goal as well as existing BMPs currently implemented in the watershed. Pages 12, 15 and 40-43 contain STEPL and EVAAL derived maps showing critical HUC 12 P loading subbasins, critical cropland and pasture soil erosion areas and feedlots with higher runoff risk within each of the five HUC 12 watersheds. Feedlots were assessed using aerial photography, topography and proximity to surface waters. Page 50 of plan describes two critical BMP-related milestones:

- (1) Monitoring the functionality of BMPs implemented in the watershed periodically after their installation (because, over time, BMPs can become less efficient at achieving designed pollutant reductions due to several factors); and
- (2) Working with DNR to use of LANDSAT satellite data and remote sensing technology to track the implementation of cropping practices and corresponding crop residue levels within the Yellow River Moon Bay watershed over time.

Collectively, this information meets element 3 criteria.

Plan does not meet this requirement. The following information is required:

- 4. Estimate of the amounts of technical and financial assistance needed, costs, and/or the sources and authorities that will be relied upon to implement this plan.**

Plan meets this requirement:

Pages 22-25, 64-73 of plan reflect element 4 criteria. Pages 72-73 describes Chippewa County Land Conservation will rely upon the existing MOU with a comprehensive NR 151 implementation strategy (including meeting with DNR staff annually to discuss/clarify NR 151 implementation roles and responsibilities) to help meet the plan’s load reduction goals. Cost estimates were based, in part, upon current/existing cost for cropland or feedlot practices.

Plan does not meet this requirement. The following information is required:

- 5. An information/education component used to enhance public understanding of the project and early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.**

Plan meets this requirement:

Pages 74-81 reflects element 5 criteria. The Little Lake Wissota project has an existing information and education program that focuses upon some areas of the Yellow River Moon Bay watershed. This plan contains milestones to expand their education and outreach effort with agricultural landowners/growers in prioritized HUC 12 sub-watersheds.

Plan does not meet this requirement. The following information is required:

6. A schedule for implementing the NPS management measures identified in this plan that is reasonably expeditious.

Plan meets this requirement:

Pages 74-78 of plan confirm a twenty-year schedule will be used to meet the plan's 54% phosphorus reduction goal. Pages 19-20 of plan describes how the plan's five HUC 12 sub-watersheds were prioritized for implementation of cropland and feedlot-based practices. The ranking of HUC 12's used STEPL derived TP and Sediment loading rates for each HUC 12, extent of ag acres and feedlots, level of existing compliance with NR 151 performance standards, density of cropland with high erosion risk and landowner cooperation factors). *Prioritizing plan implementation efforts by HUC 12 over the plan's twenty year schedule will be critical for successful plan implementation.*

Plan does not meet this requirement. The following information is required:

7. A description of interim, measurable milestones for determining whether the NPS management measures or other control actions are being implemented.

Plan meets this requirement:

Pages 79-85 contain/describe interim milestones for tracking implementation of this plan implementation it's 20 year schedule. Interim plan milestones reflect four main categories: Administrative (annual reviews of plan activities), Conservation on the Land (BMP tracking and evaluation), Environmental (WQ and habitat assessments) and Community Education and Outreach. Some interim milestones are annual, 3-5 years or are conditional based upon location and extent of plan implementation in each HUC 12 sub-watershed.

The plan has fixed 5 year interim milestones to evaluate and amend the plan's schedule and interim milestones to reflect the actual extent of cropland and feedlot conservation practices implemented in the watershed and also water quality monitoring results from Yellow River stream tributaries and Lake Wissota. The plan's interim milestones require tracking:

- The number and types of conservation practices installed in high priority HUC 12s that address critical areas and whether the extent of conservation practices measures are or are not meeting plan milestones by Year 5.
- The number and types of conservation measures installed in lower priority HUC 12s and whether the extent of conservation practices are or are not meeting plan BMP milestones by Year 10
- BMP and WQ monitoring: If the priority HUC 12's meeting or close to meeting the 5 and 10 year practice interim milestones, then complete in-stream and/or Moon Bay water quality monitoring to confirm if stream or lake shows a positive water quality response after adoption of said conservation measures by Years 7 and 15.

The plan confirms the Lake Wissota Stewardship Project team has the lead responsibility of monitoring plan implementation, tracking progress and periodically reviewing and using some of the BMP depreciation methods described within EPA technical memo #1.

Plan does not meet this requirement. The following information is required:

- 8. A set of criteria that can be used to determine whether load reductions are being achieved over time and substantial progress is being made toward attaining WQ standards and, if not, the criteria for determining whether the plan needs to be revised, or if a NPS TMDL has been established, whether the NPS TMDL needs to be revised.**

Plan meets this requirement:

Pages 85-89 and the plan's interim milestones (see comments for element 7 above) and WQ monitoring program (pages 90-105) collectively meet element 9.

Plan does not meet this requirement. The following information is required:

- 9. A monitoring component to evaluate the effectiveness of the implementation efforts over time, measured against criteria established in item 8 immediately above.**

Plan meets this requirement:

Pages 90-105 of plan describes the plan's WQ monitoring program for the watershed tributary streams and Moon Bay Lake that will be completed over the plan's 20-year schedule. The WDNR has confirmed a Targeted Watershed Assessment (TWA) for total phosphorus and biological sampling in the watershed will be completed over three year period, beginning in 2022. The TWA design involves monitoring at the HUC 12 scale, with approximately five to six sites sampled per watershed (HUC 12), at which chemistry, macroinvertebrates, fish, habitat, and flows/water level data are collected. These core indicators will be supplemented by pour point water chemistry grab samples during the growing season (May through October) for Total Phosphorus. When complete, the Lower Yellow River Watershed TWA will form a baseline data set that can be used to compare with future monitoring results, over this plan's 20-year schedule.

The plan describes WQ monitoring of selected areas of the watershed will continue after the TWA is complete. WQ monitoring will be used in tandem with BMP adoption rates in sub-watersheds to evaluate plan implementation over time. Phosphorus and Chlorophyll-a concentrations, sechhi disk measurements, dock monitoring and number of lake nuisance algae days per summer (July-Sept) season will be also used to evaluate plan implementation efforts, over time.

Plan does not meet this requirement. The following information is required: