

OCONOMOWOC

WATERSHED

PROTECTION

TMDL/Adaptive

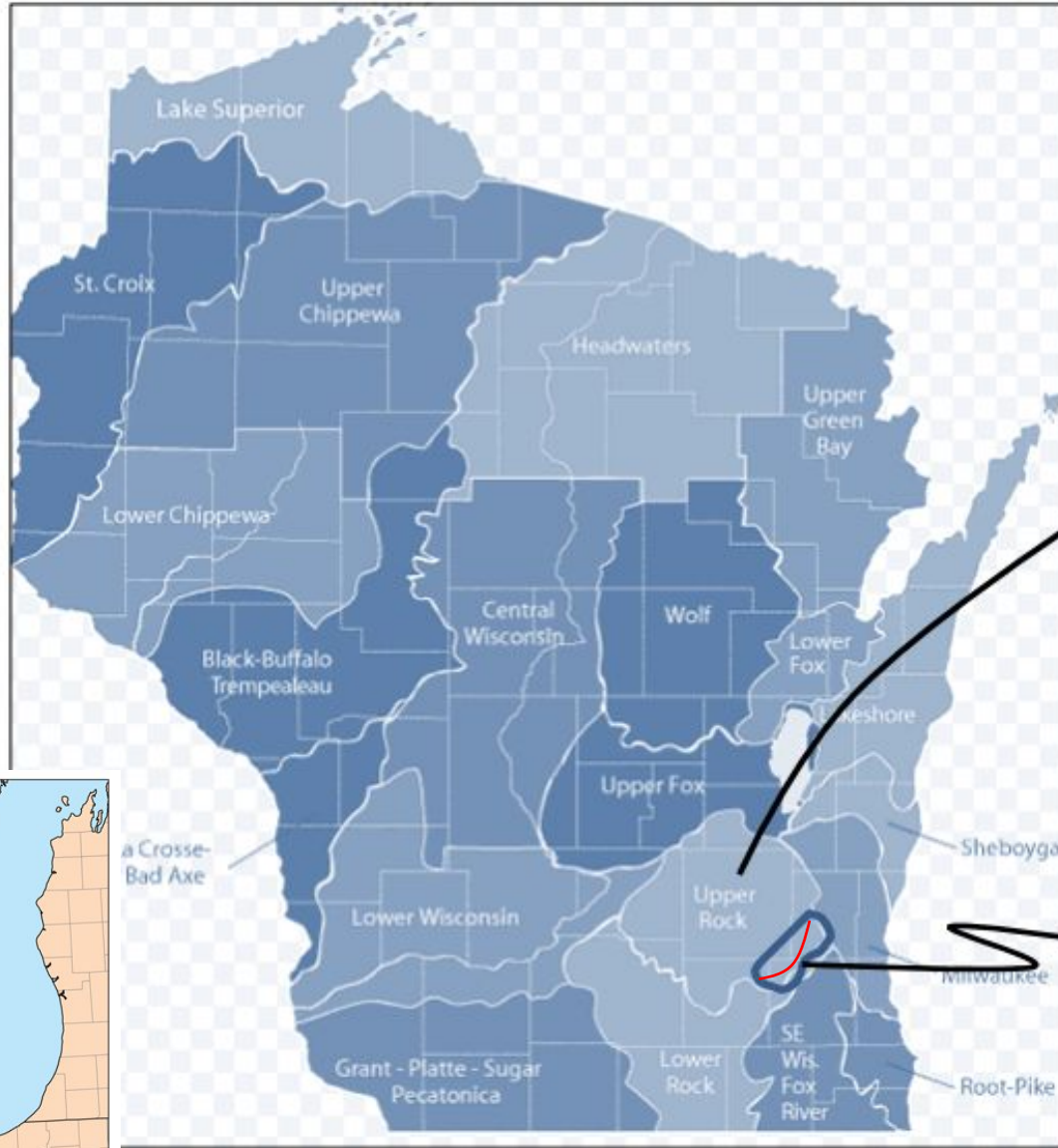
Management &

Stream Restoration



WATERSHED PROTECTION PROGRAM

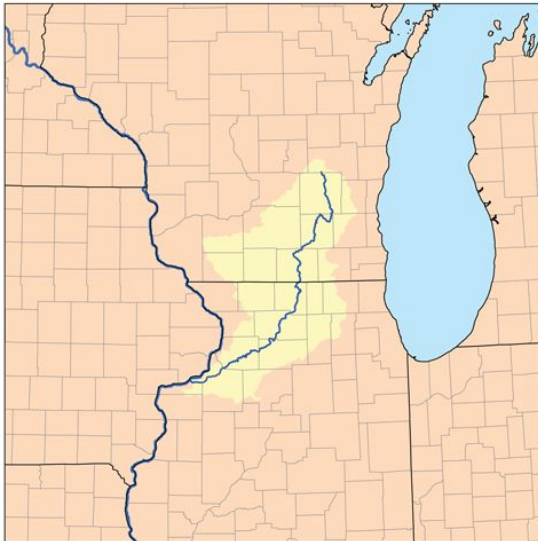
Darrell Smith, Watershed Program Director
Oconomowoc Watershed Protection Program



Rock River Watershed

Oconomowoc River Watershed

Rock River



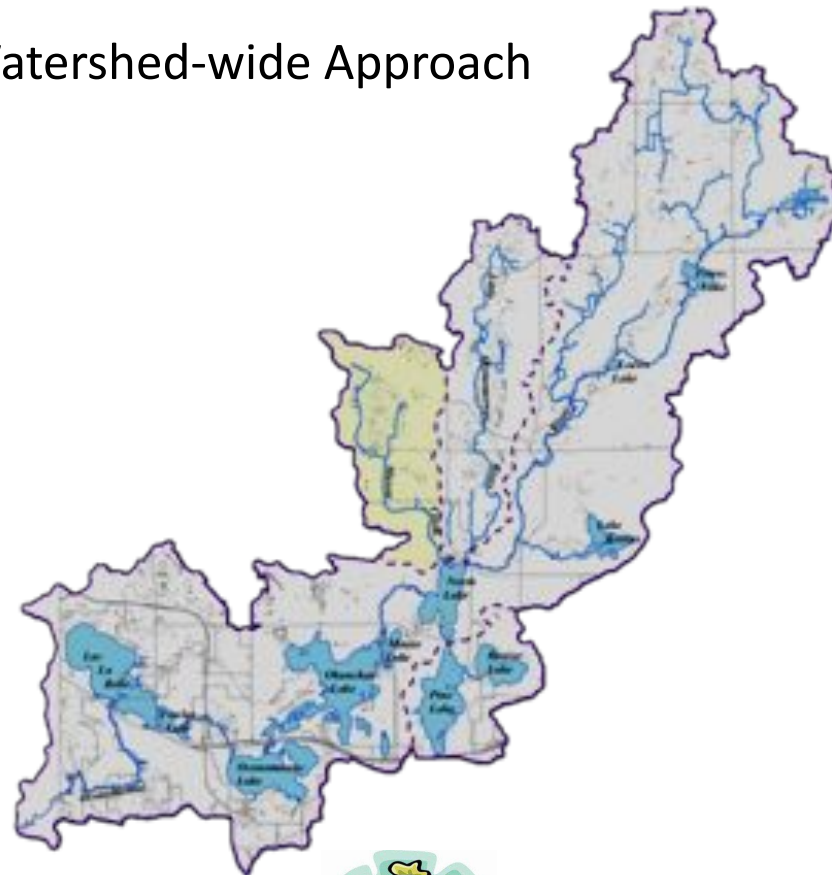
2013 – 2014, Evaluation of Options to Meet TMDL

Plant Upgrades/Stormwater



Watershed-wide Approach

OR

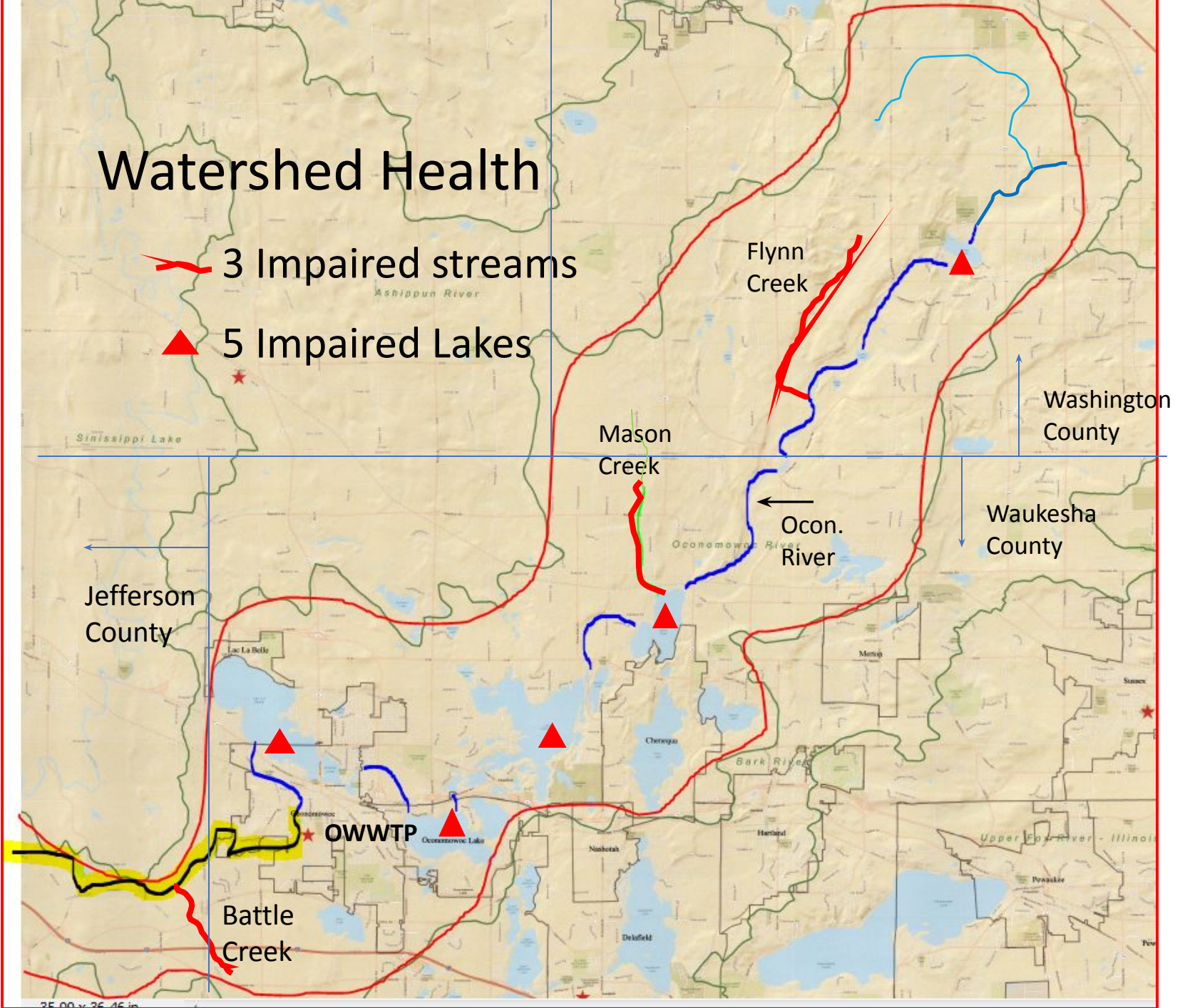


- 83,000 acres in Dodge, Jefferson, Washington, Waukesha
- 47 miles in length
- 17 lakes - 5 impaired
- 3 impaired streams

Watershed Health

3 Impaired streams

5 Impaired Lakes



2013 – 2014, Evaluation of Options

- 46% Agriculture
- 19% Wetland
- 14% Forest
- 11% Urban, suburban
- 10% Water or open land

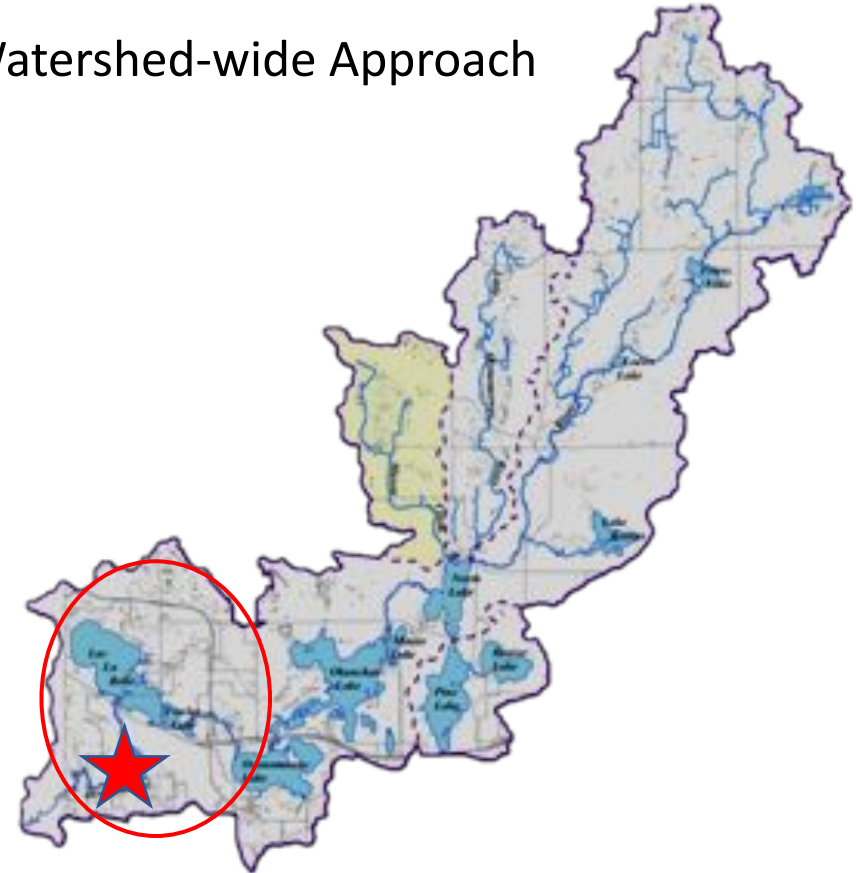
Using WDNR’s Pollutant Load Estimation Tool:

- 70% of TP loading is non-point source
- 30% of TP loading is point source

Proposed Reductions:

	Permit Term 1	Permit Term 2	Permit Term 3	Total
WWTF Effluent Reductions	2,504			2,504
CSA Management Measures	2,175	1,071		3,246
Lake Improvements	200	600	200	1,000
Streambank Stabilization	200	600	200	1,000
City of Oconomowoc MS4		500	1,500	2,000
Total	5,079	2,771	1,900	9,750

Watershed-wide Approach

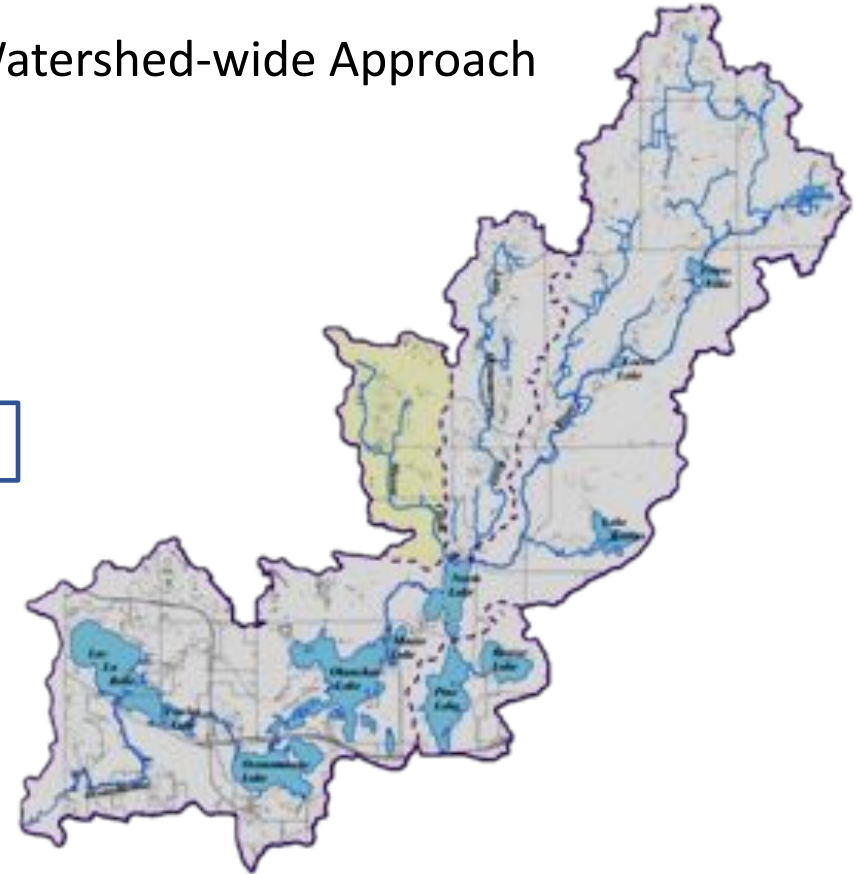
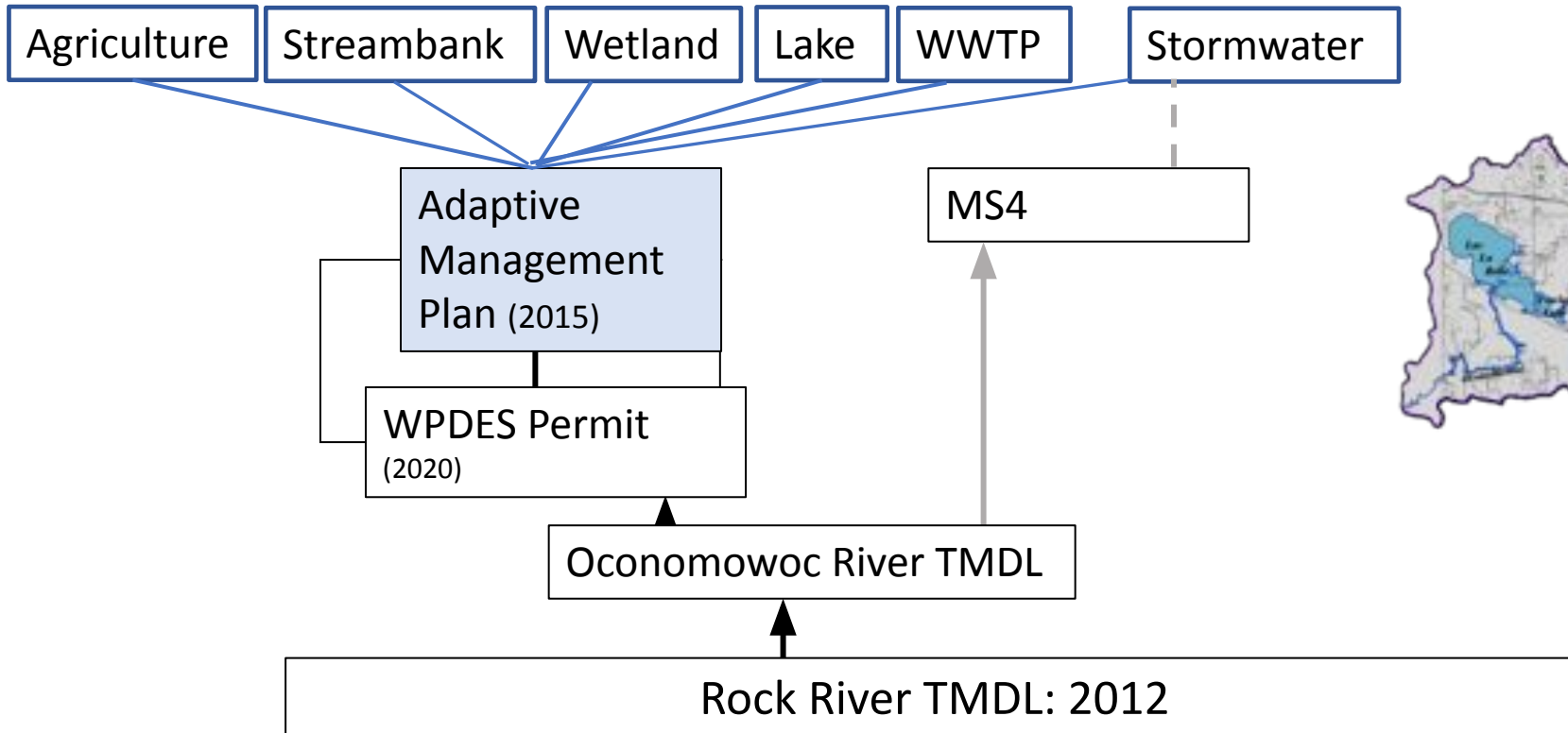


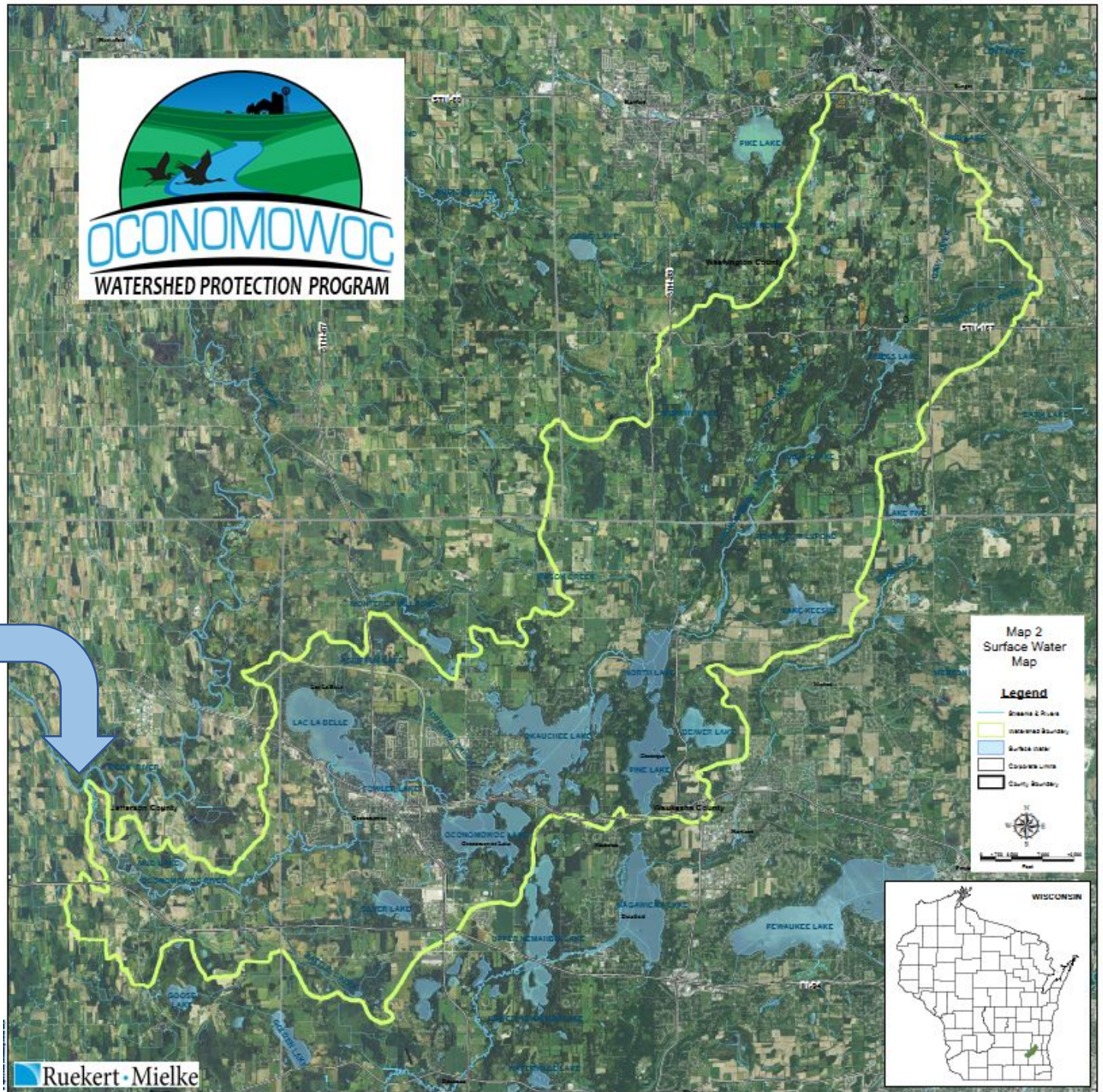
Oconomowoc Watershed Protection Program

2015



Watershed-wide Approach





Point of Compliance

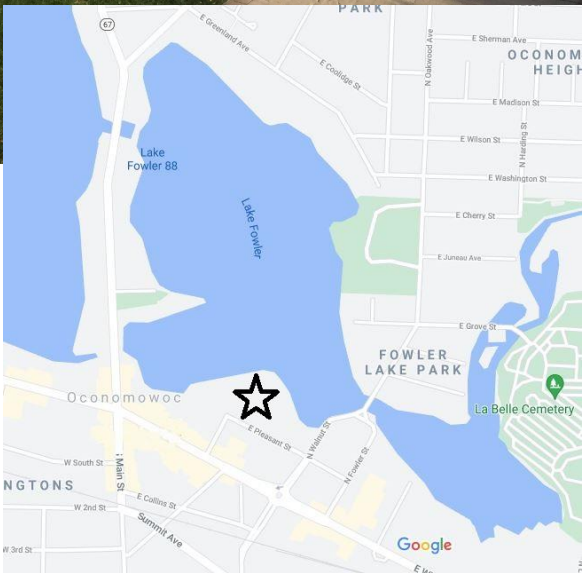
.096 → .075 Mg/L

Target date: 2030

City Stormwater Projects



Fowler Lake Parking Lot



Pine Ridge Scrapes and Prairie Restoration

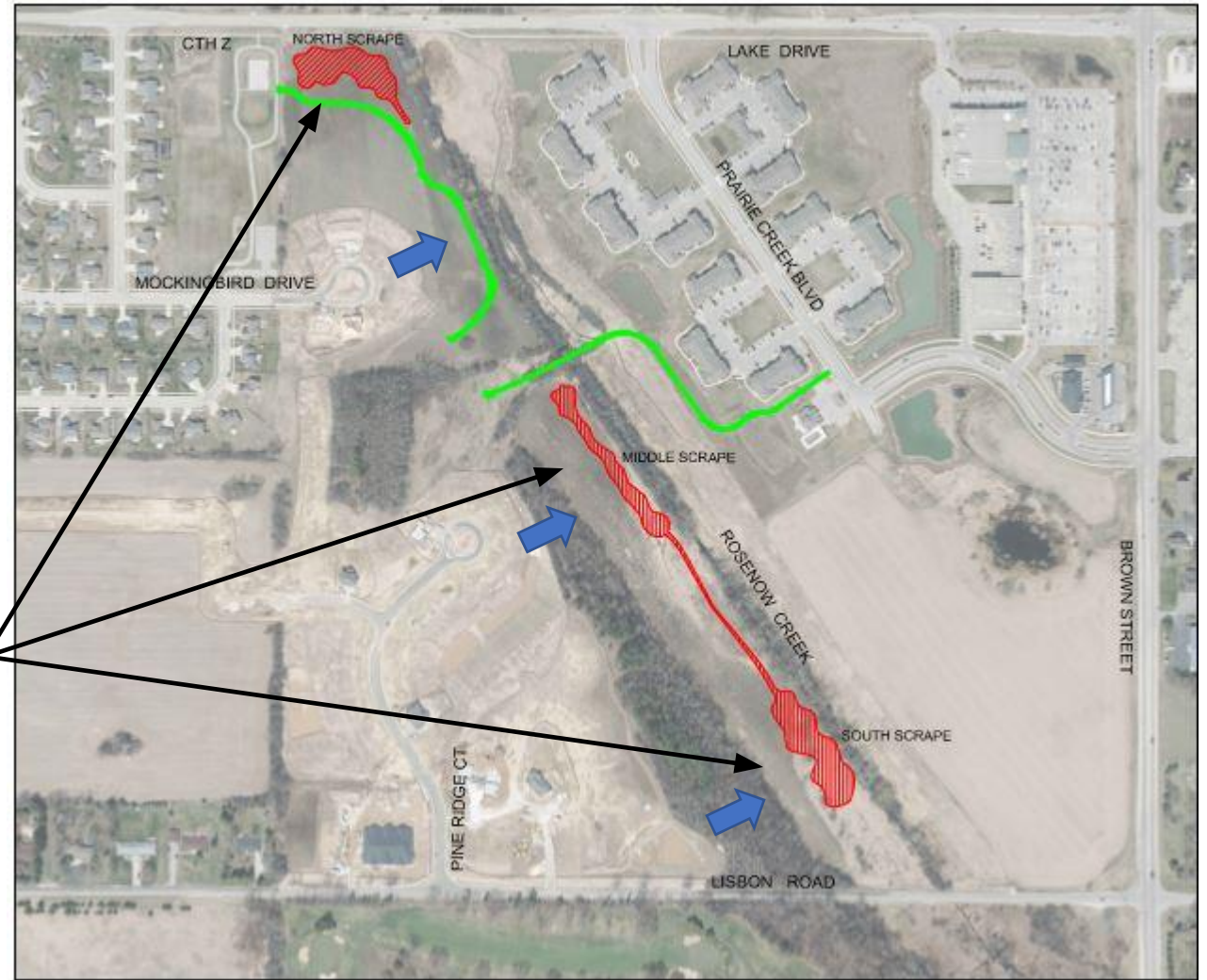
Rosenow Creek
2019-2020

Jointly-funded project:

- OWPP
- DATCP (SWRM Grant)
- US Fish and Wildlife
- Waukesha County



Three scrapes
w/ berms



Worthington Stormwater Pond

- 21,000 lbs TSS / Yr
- 53 lbs Phos / Yr
- Volume reduction from 148 ac residential area



Streambank Stabilization

	Permit Term 1	Permit Term 2	Permit Term 3	Total
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Total	5,079	2,771	1,900	9,750

] Streambank stabilization: estimated reduction of 75 lbs of TP per 1000 ft of channel length



Streambank armoring/plantings

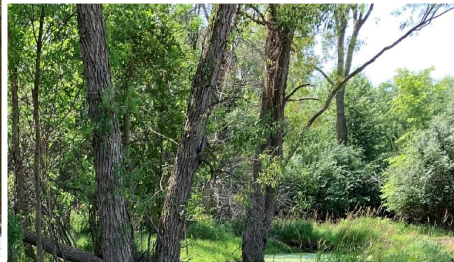


Lake shoreline plantings

Concentrated
overland flow
addressed by
perennial buffers



Photo: Zach Steinbach



Ditch Revegetation



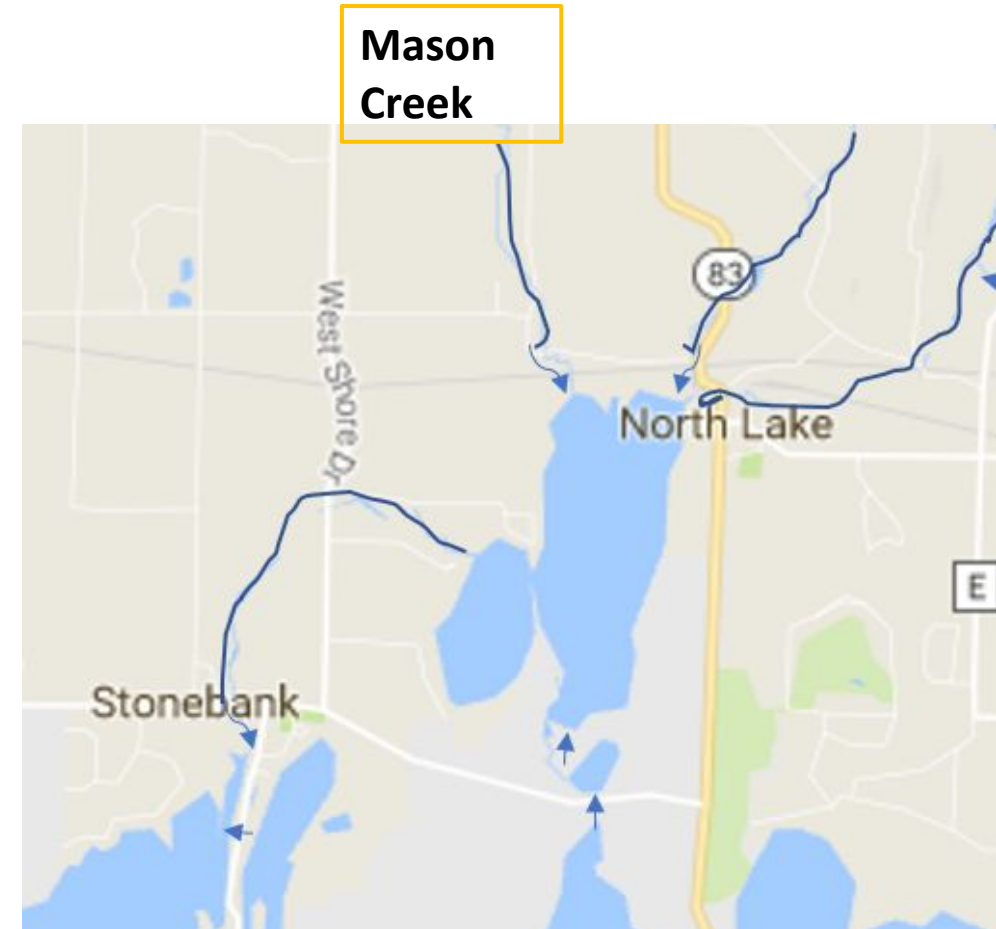
Mason Creek

History:

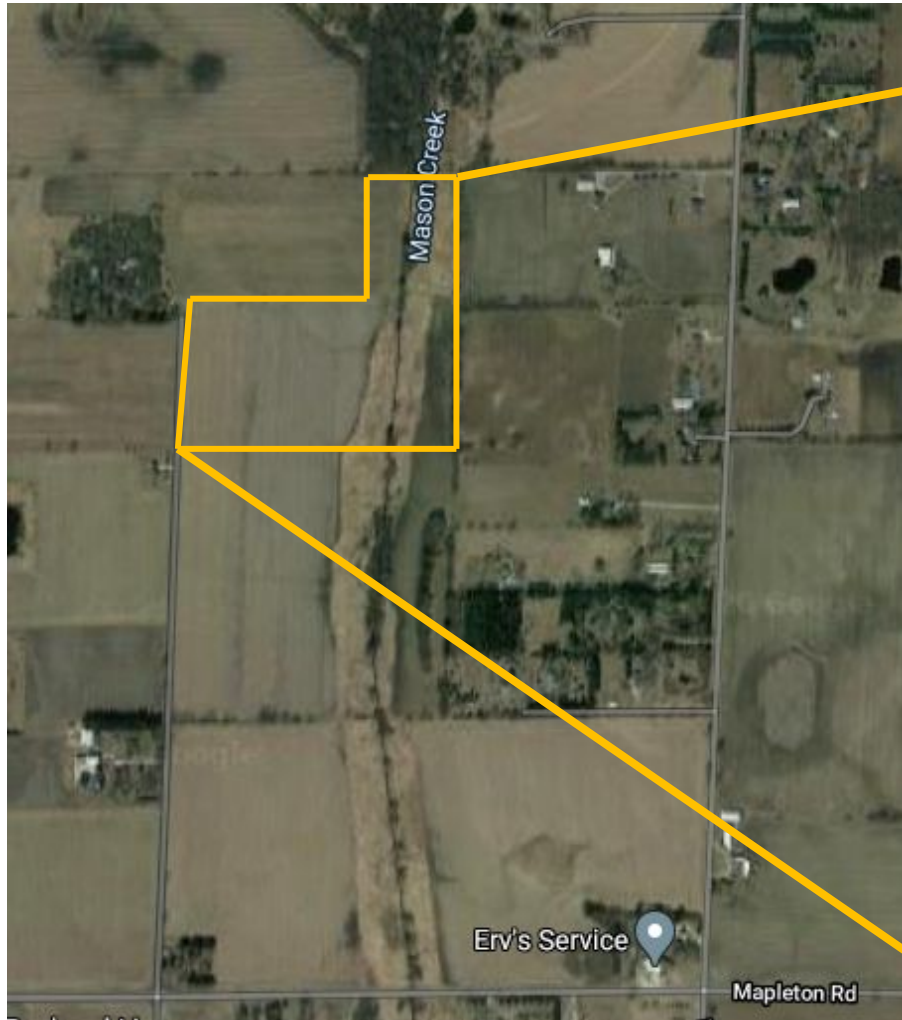
- North Lake Management District Study leads to River Management Plan
- DNR designated Impaired Stream and Class 1 Trout Stream
- 2020 Mass loading study: Mason creek is estimated to contribute 1/3 of TP load annually to North Lake, although only 1/5th of the flow volume.

Restoration Strategies:

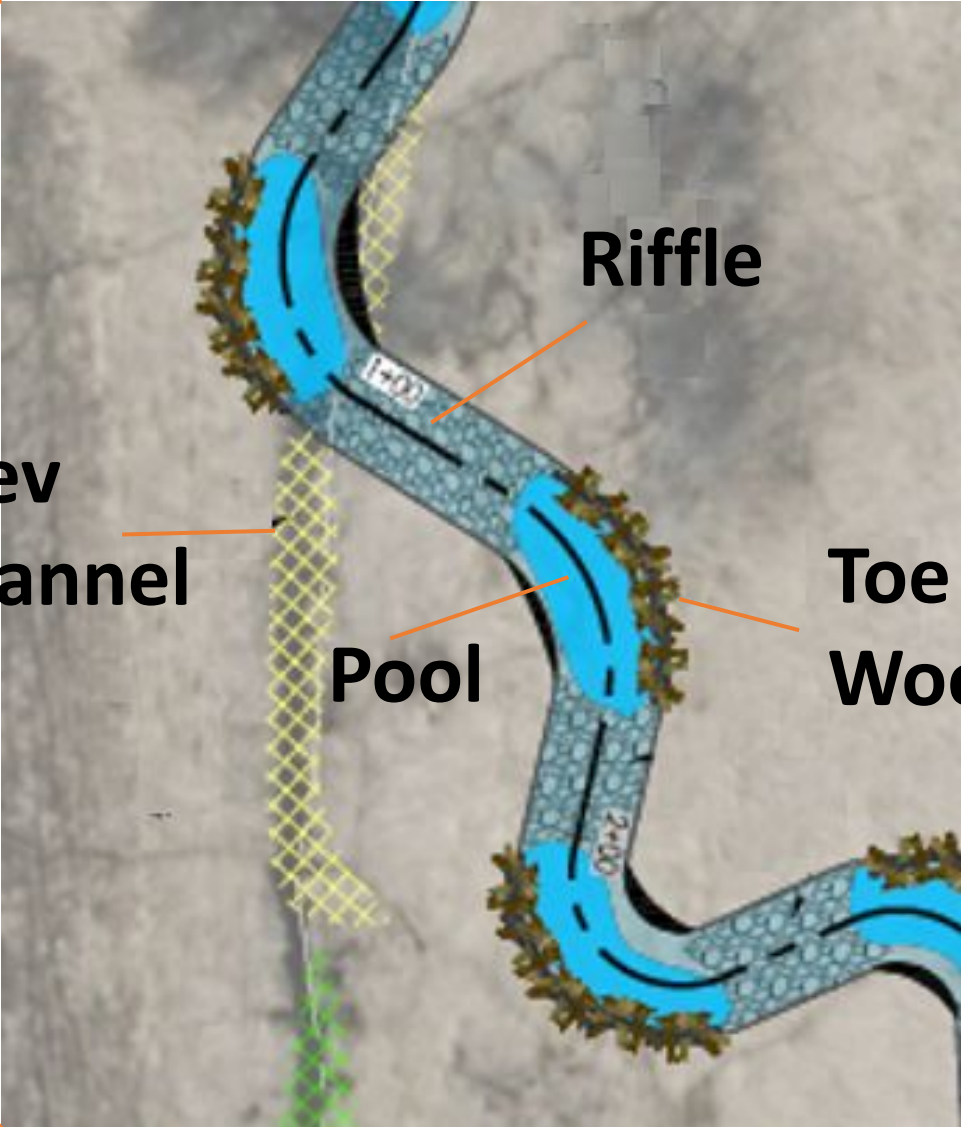
- Schmidt Parcel purchase and Mason Creek re-meander
- Pollinator buffer
- Erosion Control/shoreline plantings
- Invasive removal (phragmites and buckthorn)



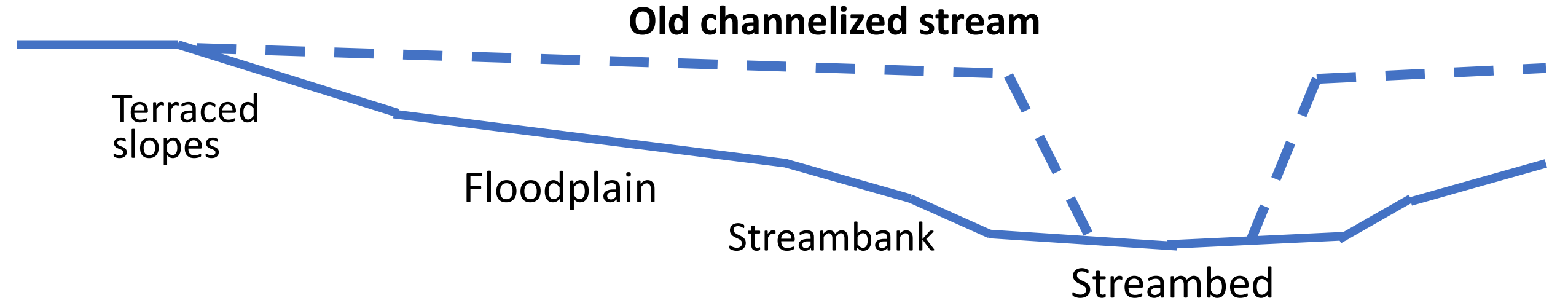
Schmidt Property- Mason Creek Restoration/Re-meander



Stream Re-meander

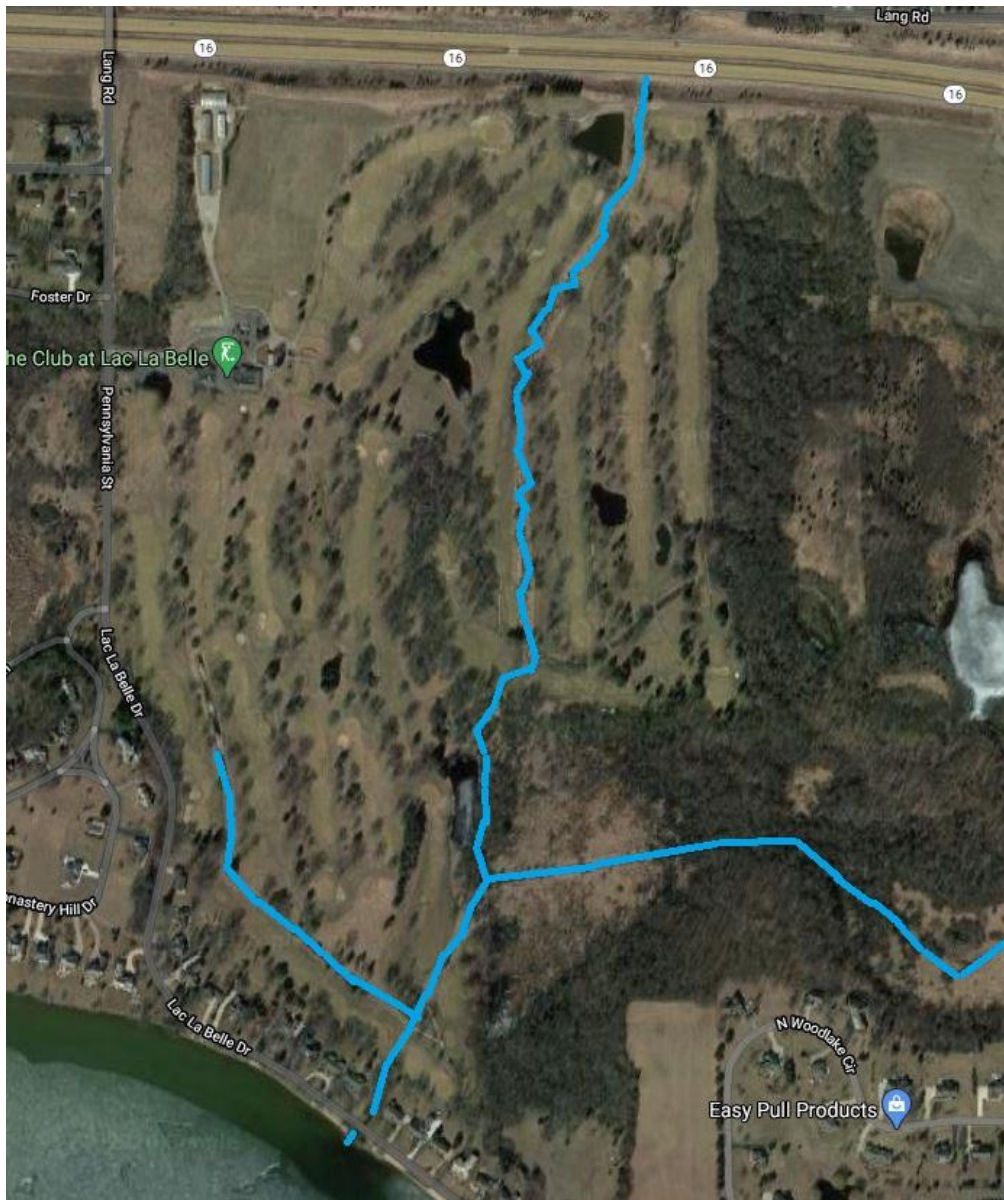


Integrating Creek into Surrounding Floodplain



Mason Creek Restoration/re-meander

- Goal: 102 lbs of Total Phosphorous Conserved/Prevented from moving downstream towards North Lake each year.
- Cost: Approx \$320,000, funded by state grants, OWPP, Tall Pines Conservancy, and individual contributions.
- Equivalent to \$157.00 per lb (20 years)
- Benefits will continue...



Lac LaBelle

Golf Course/ Cottonwood Creek

View South





*Streambank
Restoration
2020*



Lac La Belle Golf Course, completed by Village of Lac La Belle
Estimated P Load Reduction: 66 lbs/year



Golf Course/Cottonwood Creek

NRCS Streambank and Irrigation Ditch Erosion Estimator

Field Number	Eroding Strmbnk Reach #; or Ditch Side/Bottom	Eroding Bank or Ditch Length (Feet)	Eroding Bank Height; or Ditch Bottom Width* (Feet)	Area of Eroding Strmbank or Ditch (FT ²)	Lateral or Ditch Bottom Recession Rate (Calculated) (FT / Year)	Estimated Volume (FT ³) Eroded Annually	Soil Texture	Approximate Pounds of Soil per FT ³	Estimated Soil Loss (Tons/Year)	Soil TP %	Total Annual P Load (pounds)
Reach 2 328.7 L.F.	West Side	328.7	1.0	329	13.00	4,273.1	Silt Loam	85	181.6	0.00031	112.6
	East Side	328.7	1.0	329	9.44	3,102.9	Silt Loam	85	131.9	0.00031	81.8
Total Estimated Annual Streambank or Ditch Erosion Soil Loss (Tons):									313.5		194.4

Field Number	Eroding Strmbnk Reach #; or Ditch Side/Bottom	Eroding Bank or Ditch Length (Feet)	Eroding Bank Height; or Ditch Bottom Width* (Feet)	Area of Eroding Strmbank or Ditch (FT ²)	Lateral or Ditch Bottom Recession Rate (Calculated) (FT / Year)	Estimated Volume (FT ³) Eroded Annually	Soil Texture	Approximate Pounds of Soil per FT ³	Estimated Soil Loss (Tons/Year)	Soil TP %	Total Annual P Load (pounds)
Reach 3 412.1 L.F.	West Side	400.0	0.8	320	21.56	6,899.2	Silt Loam	85	293.2	0.00031	181.8
	East Side	400.0	0.8	320	9.70	3,104.0	Silt Loam	85	131.9	0.00031	81.8
Total Estimated Annual Streambank or Ditch Erosion Soil Loss (Tons):									425.1		263.6

Field Number	Eroding Strmbnk Reach #; or Ditch Side/Bottom	Eroding Bank or Ditch Length (Feet)	Eroding Bank Height; or Ditch Bottom Width* (Feet)	Area of Eroding Strmbank or Ditch (FT ²)	Lateral or Ditch Bottom Recession Rate (Calculated) (FT / Year)	Estimated Volume (FT ³) Eroded Annually	Soil Texture	Approximate Pounds of Soil per FT ³	Estimated Soil Loss (Tons/Year)	Soil TP %	Total Annual P Load (pounds)
Reach 4 296.6 L.F.	West Side	280.0	0.7	196	11.76	2,305.0	Silt Loam	85	98.0	0.00031	60.7
	East Side	280.0	0.7	196	4.44	870.2	Silt Loam	85	37.0	0.00031	22.9
Total Estimated Annual Streambank or Ditch Erosion Soil Loss (Tons):									134.9		83.7
Total All Reaches									873.6		541.6

* Eroding bank height is measured along the bank, not the vertical height of bank.

Note: Lateral recession rate measured by comparing aerial photos from 2015 and 2020. Eroding Bank Height from field observations and averaged through each Reach

Entire stream bank is void of vegetation at bank bottom

Streambank or Ditch Erosion Calculation Formula:

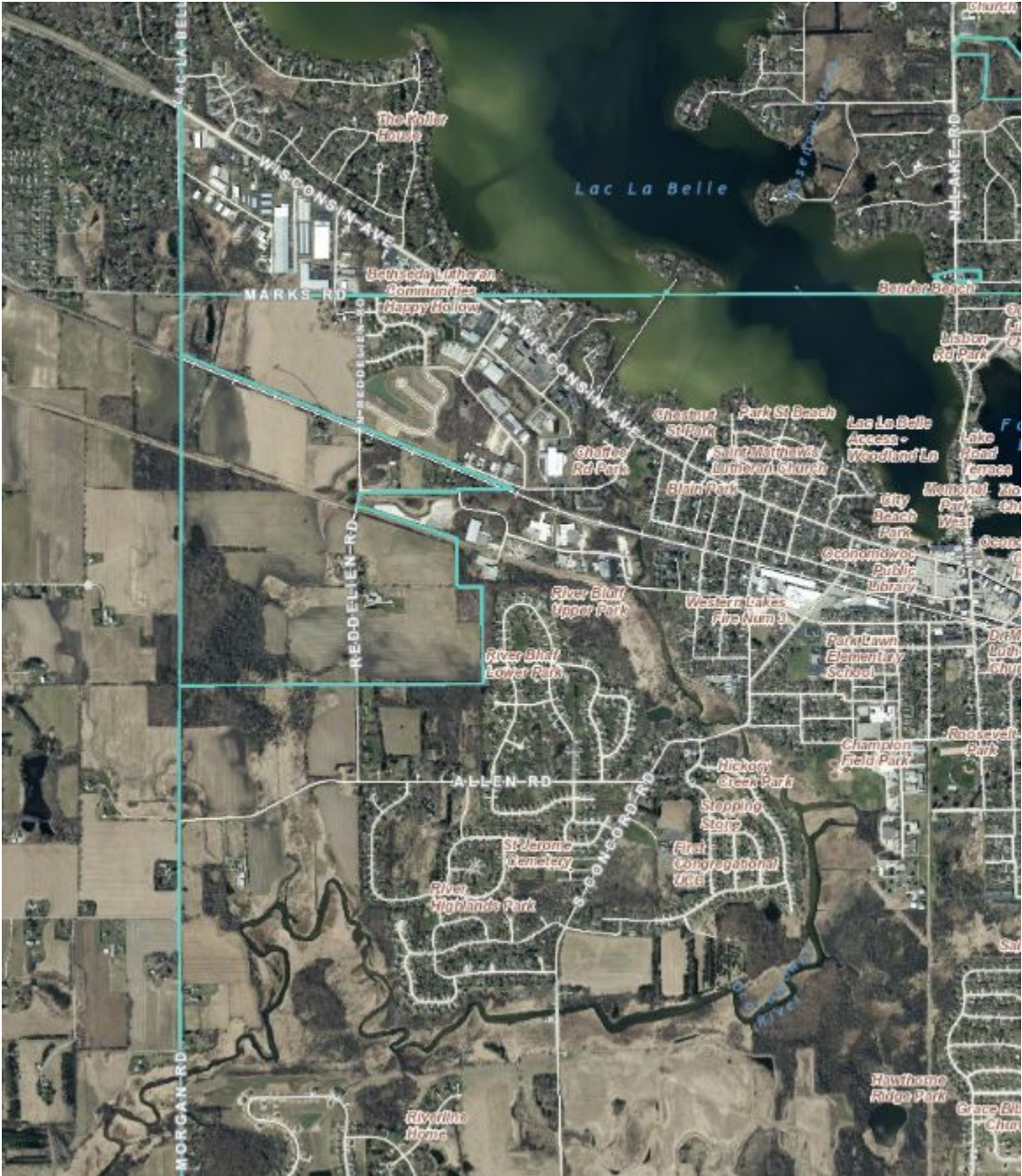
Eroding Bank/Ditch Length X Eroding Bank Ht or Ditch Bottom Width X Lateral or Ditch Bottom Recession Rate (FT/YR) X Soil Weight (lbs/ft³)

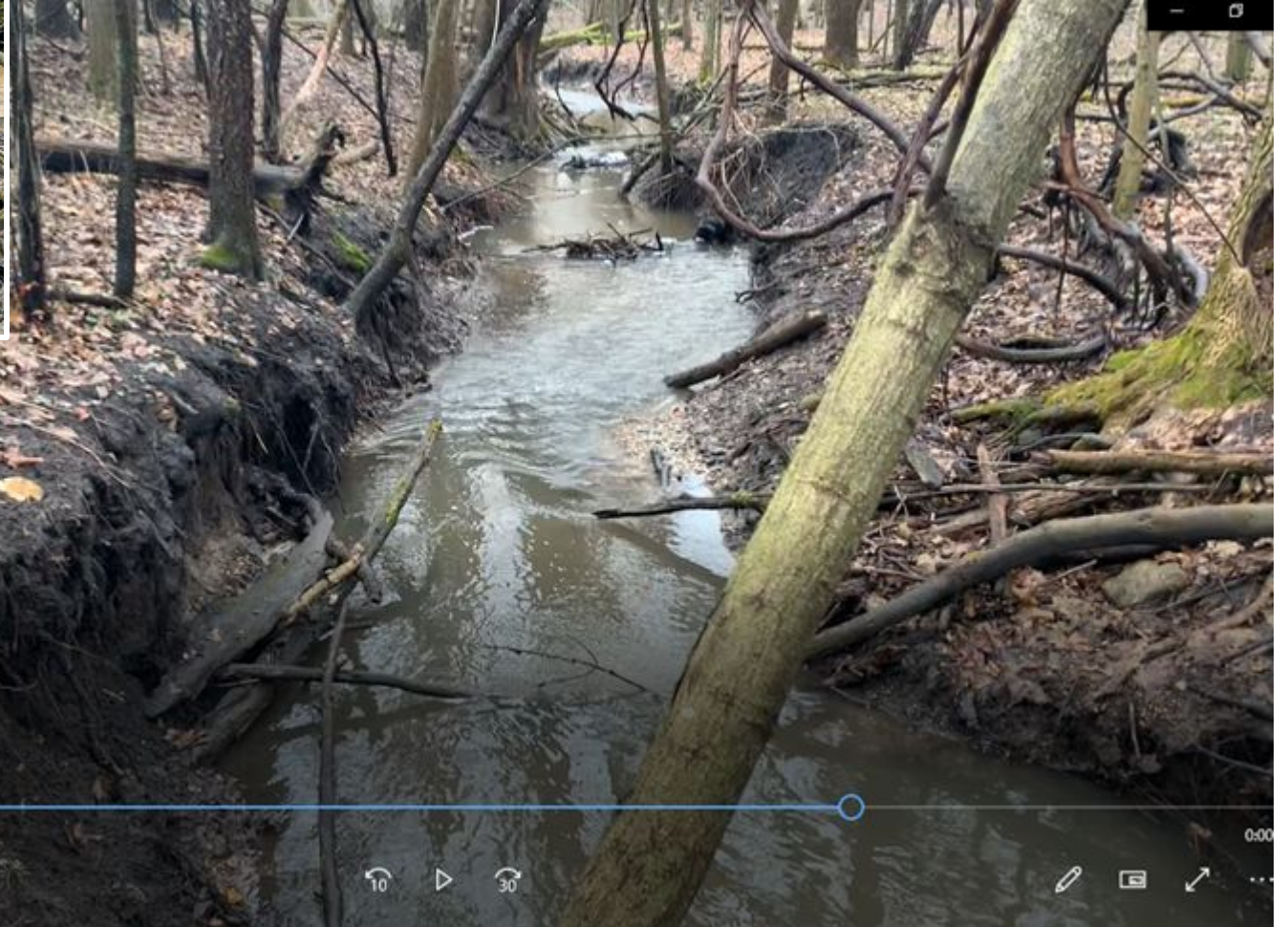
Estimated Soil Loss
= Per Year (Tons)

Golf Course/ Cottonwood Creek

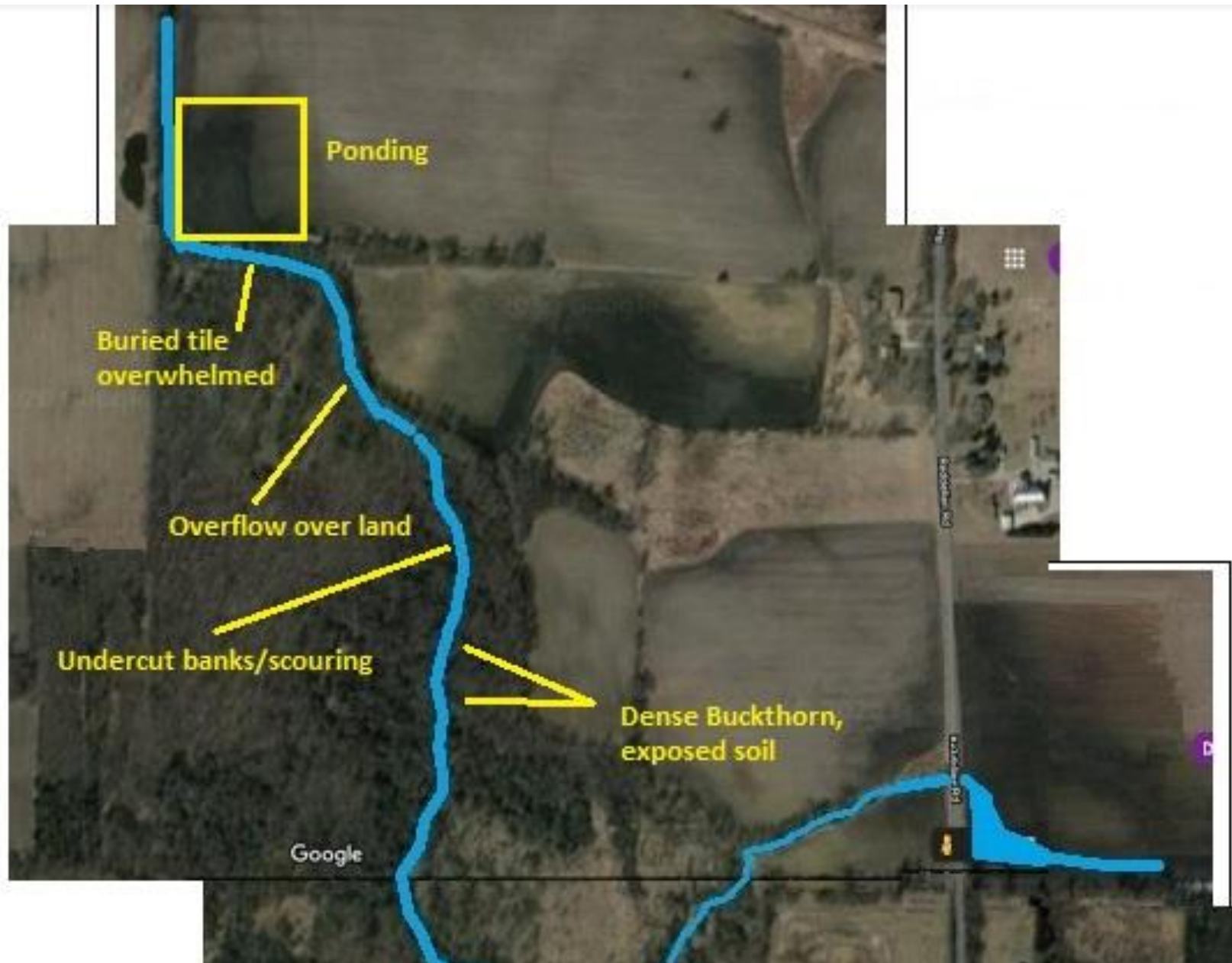


Future Project:
Allen Creek





Streambank erosion



Ponding

Buried tile overwhelmed

Overflow over land

Undercut banks/scouring

Dense Buckthorn, exposed soil

Google

Proposed Project

2500 line feet

Phosphorous Credit Generation
Estimated 400 – 700 lbs annually

- Streambank Stabilization
- Wetland Construction
- Additional Bare Ground Remediation

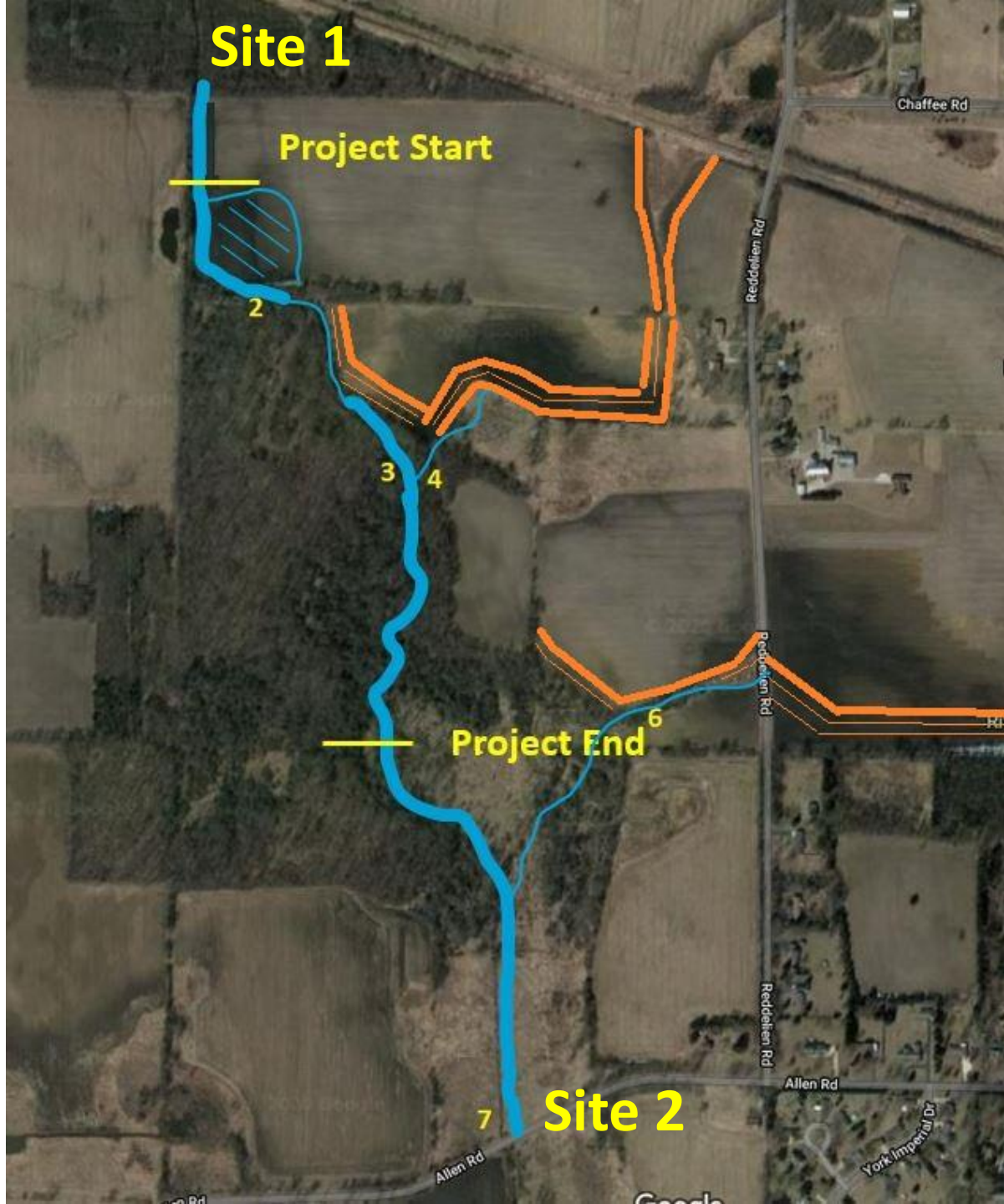
Cost range for 20-year period:
\$75 to \$175 per lb per year



Resource Environmental Solutions, LLC



- 2021 Sampling**
- TP
 - TSS
 - Estimated Flow



Measuring Stream Flow and Calculating Mass Load

P Concentration
X
Flow (MGD)
X
8.34
= Total Mass Load

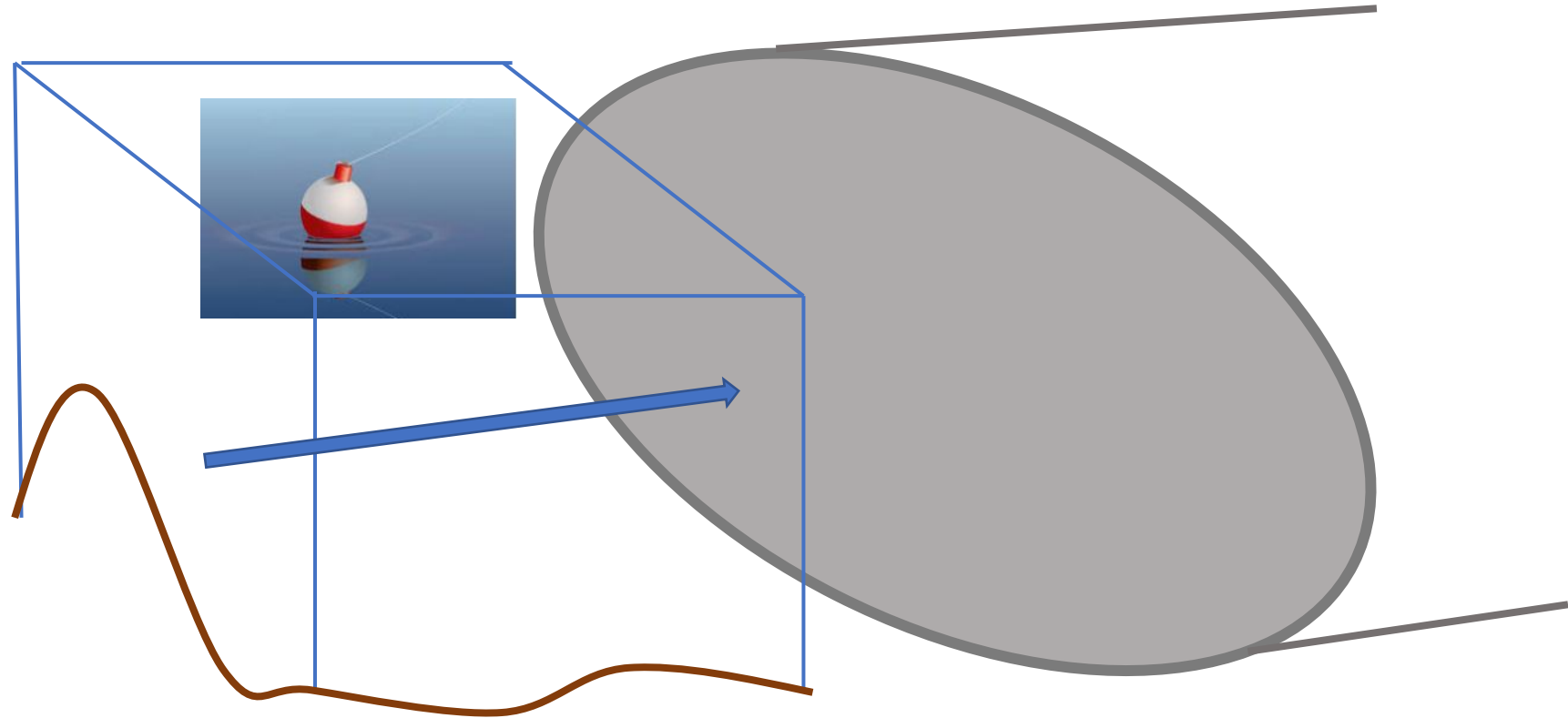




Photo: Zach Steinbach



Future is bright for the watershed...

OWPP NEWSLETTER

2-3 x a year

Volume 1, Issue 1

FROM THE WATERSHED
streamings
Oconomowoc Watershed Protection Program Newsletter



WELCOME TO THE FIRST ISSUE
*OF THE OCONOMOWOC WATERSHED
PROTECTION PROGRAM (OWPP) NEWSLETTER*

Look for this publication to arrive at your mailbox or in your e-mail two to three times per year starting in 2020. Packed with great information, this newsletter will serve as your connection to important updates and information on program progress, new practices and technology, upcoming training events, and educational opportunities.

The History of the OWPP
In 2014, the City of Oconomowoc was facing new, more stringent requirements on reducing phosphorus in the Oconomowoc River due to increasing algae blooms and surface water quality degradation across Wisconsin and the US. The options to meet the new requirements were to install new equipment with a very high price tag at the wastewater treatment plant and in the storm water system or work throughout the entire 49 mile watershed. The City recognized the clear benefits of working in the watershed and in September of 2015 the OWPP was born. The program was approved by the Wisconsin Department of Natural Resources (WDNR) under the rules of a new program called Adaptive Management. Through the Adaptive Management program, the City has partnered with many entities across Washington, Waukesha, and Jefferson counties through which the river flows. The partners in this program include government agencies, municipalities, non-profit organizations, environmental groups, agricultural groups and coops, private landowners, and federal and county land and water agencies. The overall goal

UPCOMING EVENTS

FRI / DEC 13 / 2019
9a-2:30p
Nutrient Management Training
Hands on training for YOUR plan.

THURS / JAN 9 / 2020
9a-2:30p
Manure Application
Making sense of the regulations.

THURS / FEB 20 / 2020
6p-8p
Water Quality & Your Watershed
Oconomowoc Community Center

FRI / JUNE 5 / 2020
5th Annual
Healthy Lakes Conference

SAT / AUG 15 / 2020
12th Annual Ride to the Barns
Camp/Quad

Contact Us:

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- Wastewater Treatment, Program Oversight

Tom Steinbach, Watershed Advisor, Tall Pines Conservancy
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- Adaptive Management, Water Quality Monitoring, Partnerships