Healthy Soil/Healthy Water

Preserving our Land and Water Legacy in the

Wisconsin River Basin through Locally Led Conservation

Our Soil & Water is essential for life and is unendingly being utilized for fulfilling our worldly needs – Finding a healthy balance is essential in maintaining that life

Linking Agricultural Trends to Water Quality Improvement

- Agricultural is changing at a very rapid pace. Small family owned farms face the most difficult challenges do to economic restraints and don't always have the resources necessary to weather the storm
- Tools, technology and a changing workforce are driving changes in the agriculture landscape – changes that can have a positive impact on the agriculture industry & the environment in Wisconsin
- Producer Led Watershed Protection – Success means having strong farmer leadership and a commitment to improving water and soil quality on Wisconsin farmland. This effort includes learning about best management practices, installing conservation practices, and forming partnerships to strengthen their efforts tailored to their local conditions
- The population of the world is estimated to hit 9 billion people by 2050, the demand to supply enough food, fiber and energy to supply the world will be a daunting task. Production & precision agriculture will be our focus as we look forward into the future
- The Wisconsin River Basin TMDL (Total Maximum Daily Load) Study has been the tool our area of Wisconsin will use to move forward

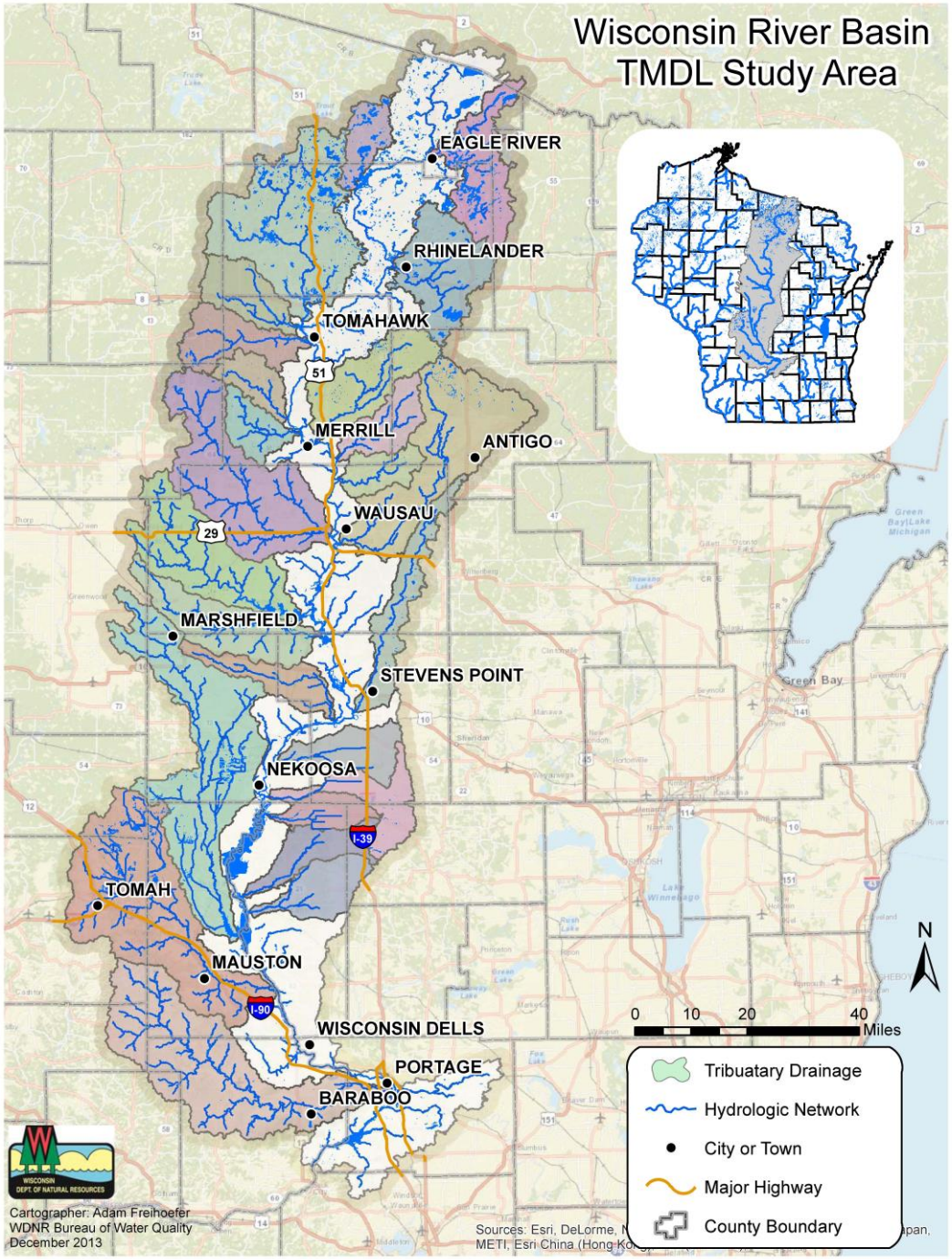

WISCONSIN RIVER BASIN
CLEAN WATERWAYS PROJECT
Do you live in the central Wisconsin River basin?
Rainbow Flowage
Rhinelander Flowage
Lake Alice
Lake Wausau
Big Eau Pleine Resevoir
Lake DuBay
Stevens Point Flowage
Biron Flowage
Petenwell Flowage
Castle Rock Flowage
Lake Wisconsin

What Approach is Wisconsin Taking

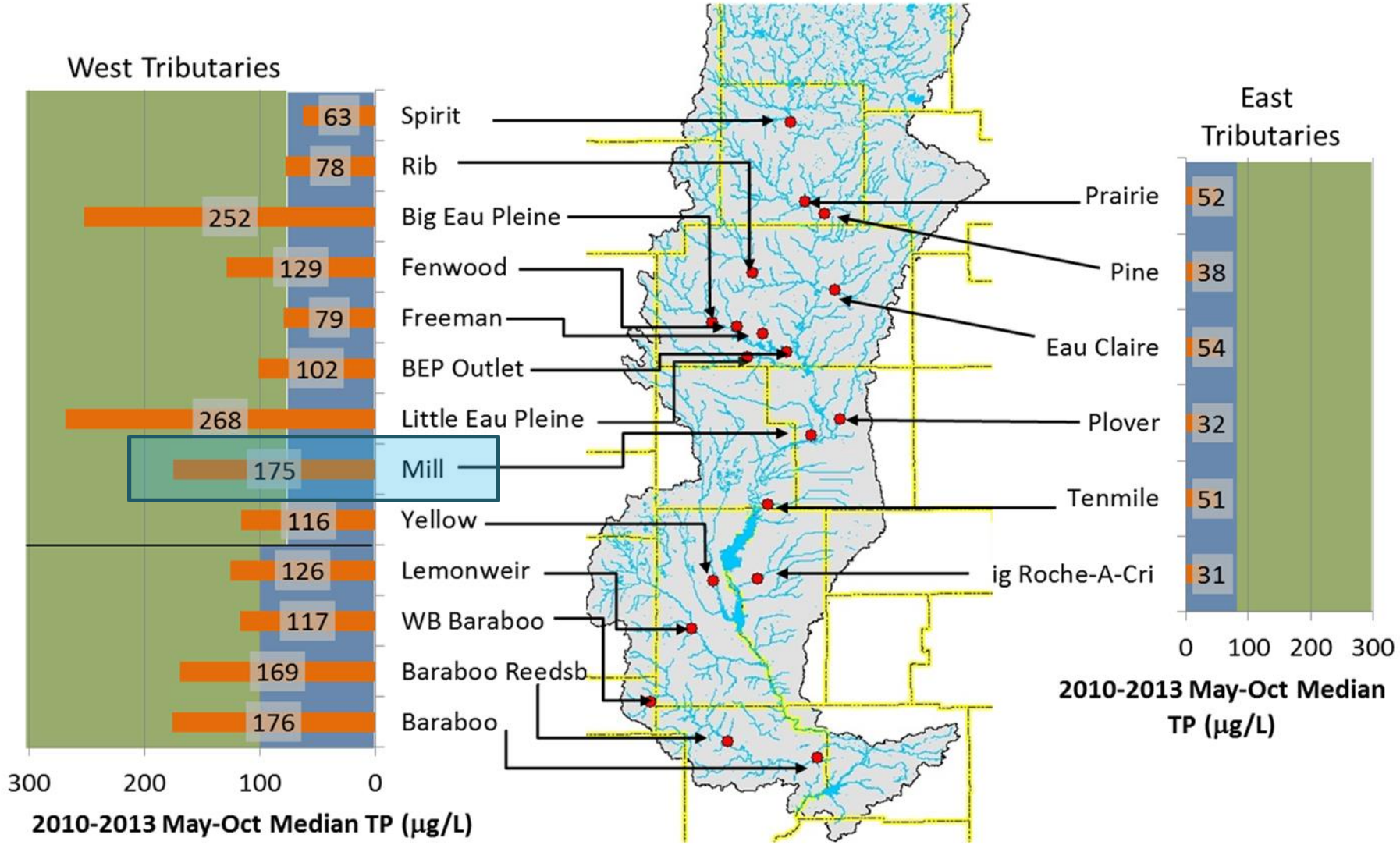
Impaired waters in Wisconsin are addressed through an analysis, known as a Total Maximum Daily Load (TMDL). A TMDL is the amount of a pollutant a waterbody can receive and still meet water quality standards. Basically it is a pollution "budget" for a water body or watershed that establishes the pollutant reduction needed from each pollutant source to meet water quality goals.

The Total Maximum Daily Load (TMDL) program, established under Section 303(d) of the Clean Water Act, focuses on identifying and restoring polluted rivers, streams, lakes and other surface waterbodies. TMDLs are prepared for waters identified as impaired on the 303(d) list

A TMDL is a written, quantitative assessment of water quality problems in a waterbody and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a waterbody


Wisconsin River Basin
TMDL Study Area
EAGLE RIVER
RHINELANDER
TOMAHAWK
51
MERRILL
ANTIGO
WAUSAU
29
MARSHFIELD
STEVENS POINT
NEKOOSA
I-39
TOMAH
MAUSTON
I-90
WISCONSIN DELLS
PORTAGE
BARABOO
Green Bay
Lake Winnebago
N
0 10 20 40
Miles
Tribuatary Drainage
Hydrologic Network
City or Town
Major Highway
County Boundary
WISCONSIN DEPT. OF NATURAL RESOURCES
Cartographer: Adam Freihoefer
WDNR Bureau of Water Quality
December 2013
Sources: Esri, DeLorme,
METI, Esri China (Hong Ko

Tributary Phosphorus Concentrations



Wisconsin River – From the Headwaters to the Mississippi River

The 430-mile Wisconsin River is the longest river in Wisconsin. It begins as a small stream at the Lac Vieux Desert dam and flows diagonally southwest across Wisconsin to the Mississippi River just south of Prairie du Chien, Wisconsin.

Success Then & Moving Forward

- Although maintaining the water quality of the river remains a continual challenge, the river is winning. People care. Industry, government, and countless communities are working together because they recognize the value of a healthy source of freshwater. The Wisconsin River is now a cultural and economic treasure

- The Wisconsin River's revitalization is a story about determination, collaboration, and success. As a community we took the chance and it paid off. Those paper mills that embraced the change are still in operation. They are not only surviving but thriving. Similarly, the municipalities that initially resisted the environmental regulations are now making more money on tourism than the ever could have expected. Protecting our environment is important. The story of the Wisconsin River demonstrates the environmental and economic case for working together.

- What is next? More of the same! This is a turning point in the way Wisconsin is going to view Point & Non-Point Sources. You as individuals have the ability to make change through collaboration, engagement & networking. Your way of thinking does make a difference.

Wisconsin River History

Facts about the river:

- Basin covers 1/5 of the state through 25 counties
- Drops 1,067 feet in elevation
- 430 miles long
- The River has 26 dams, 14 paper mills, and 43 municipalities, the Wisconsin River is known as the hardest working river in America
- Just 40 years ago you couldn't swim in the river without getting sick. Contamination of the river resulted in widespread deformities of fish and other aquatic life. Residents knew from experience that eating a fish from the river would most certainly make you sick. Pictures of the river from this time period showed excessive sludge on the waters surface
- Then in the 1970s something amazing happened. People started to work together. It didn't happen overnight. It took a lot of time, money, and compromise. Paper mills, energy companies and municipalities invested hundreds of millions of dollars to modernize following new environmental regulations established by the government

Healthy Soil

What is a healthy soil? A healthy soil is an undisturbed soil which performs valuable services that are not obvious, such as flood control, waste (nutrient) recycling, water filtration/storage and soil stability through minimizing soil disturbance. Tillage is the most difficult agricultural habit to change. Intact soil works for you; disturbed soil costs you time and money

No-Till & Cover Crops

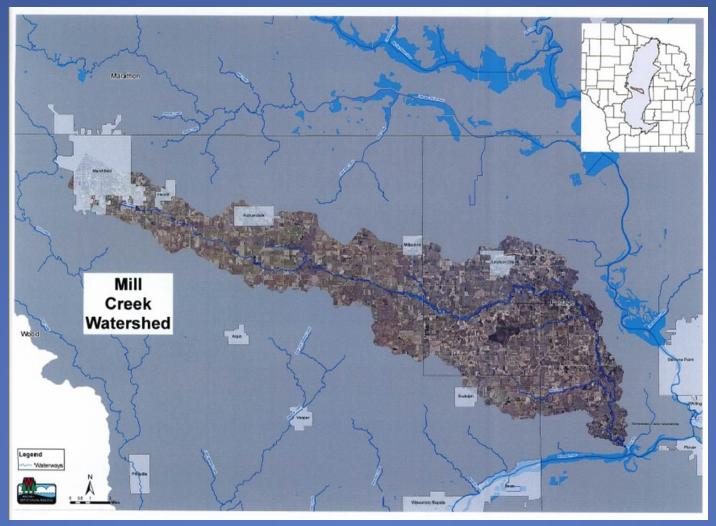
- Reduces soil disturbance
- Reduces root damage to crops
- Every tillage pass can cause available plant moisture to drop .25 inch.
- Crop residue moderates soil temperatures, reducing soil moisture evaporation, especially in the top two inches.
- Corn stalks can help trap snow, which can add up to 2 inches of soil moisture after snow melt in the spring.

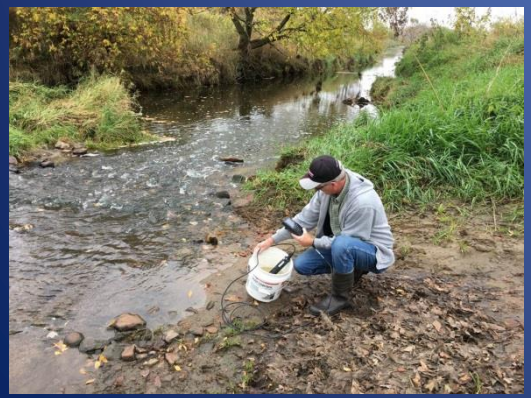
Conservation Practices

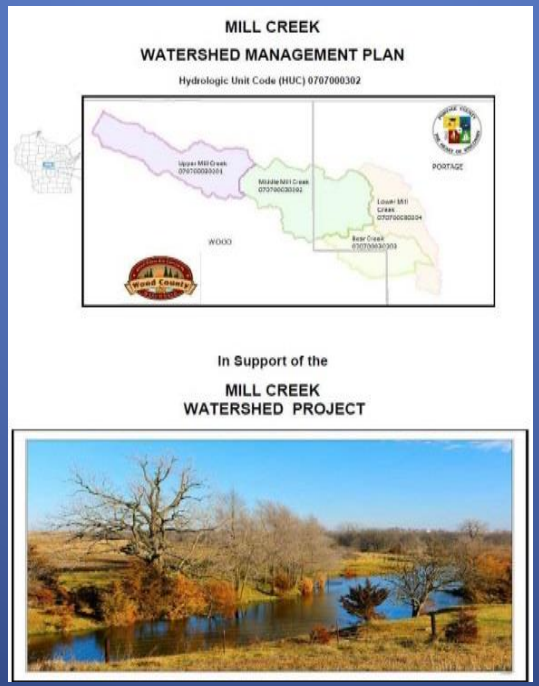
"A nation that destoys its soil destroys itself."

-FDR

NEW INITATIVES IN THE WOOD COUNTY LAND & WATER CONSERVATION DEPARTMENT







Building:
Partnerships & Collaboration
Trust
Friendships
Common Goals
Solutions Not Problems
A Sense Of Accomplishment
Compromise & Resolution

Wood County Land & Water Conservation

Our Mission

Protect, improve, and manage land and water resources in Wood County through technical and financial assistance, educational opportunities, enforcement of County Ordinances, and administration of State programs to permanently benefit land and water resources for it's citizens.

Regular People Who Love These Lakes

HEALTHY SOIL HEALTY WATER

DRAFT

HEALTHY SOIL
HEALTHY WATER

Preserving our Land and Water Legacy in the Wisconsin River Basin through Locally Led Conservation

Thursday, March 22, 2018, 8:30 a.m. - 3:00 p.m.

UW-Marshfield/Wood County 2000 W. 5th Street | Marshfield, WI

Workshop Agenda

TOPICS:

- Agricultural Practices and Economics to Improve Soil Health
- Linking Agricultural Trends to Water Quality Improvement
- Success Stories from Producer-led Councils

Featured Speaker: Andy Bendsend (Dallas, WI)

Over the years, Bensend has developed a successful formula based on no-till, integrated pest management, crop rotation, cover crops and perseverance. Today, his enterprises include more than 4,000 acres of primarily corn and soybeans using no-till or strip-till practices.

Workshop Panels: *The first panel will feature speakers on ag practices and on-farm affects of conservation practices. The second panel will address tools to help build leadership in communities around healthy soil and conservation practices.*

General registration opens Feb 22. Space is limited, register now to reserve your spot!

$25 registration includes materials, lunch and snacks. Early bird registration $15 for farmers registering by March 9. No walk-ins

http://fyi.uwex.edu/healthysoilwater/

Workshop Planning Partners and Sponsors

Organic Valley Farmer-Owned

PACRS Petenwell and Castle Rock Stewards

Home Grown Wisconsin Potatoes

Wisconsin Farm Bureau Federation

Wood County Wisconsin — Wood Co. Land & Water Conservation

UW Extension

City Of Marshfield Wisconsin

River Alliance of Wisconsin

WOOD COUNTY CRANBERRY PRODUCTION

Wood County is the top producer of cranberries in the top cranberry producing state in the country.

5,451 acres in cranberries

WOOD COUNTY CROP PRODUCTION AND CROP ACREAGE

• Farms	1,067 units
• Land in farms	222,730 acres
• Average size farm	209 acres
• Alfalfa and other forage	43,109 acres
• Corn and grain	32,301 acres
• Soybeans	21,961 acres
• Corn silage	13,586 acres
• Cranberries	5,451 acres
• Oats for grain	2,011 acres
• Christmas trees	402 acres

Wood County Dairy Farms

Farm by Size:

- 0 to 99 cows …… 209 farms – 84%
- 100 to 249 cows …… 27 farms – 11%
- 250 to 499 cows …… 10 farms – 4%
- 500 to 999 cows …… 2 farms – 0.8%
- 1000 or more cows …… 1 farm – 0.2%

This is the third Annual Workshop

- Over the last two years we have hosted two workshops and had around 230 participants with 50% being Producers
- Our planning committee and sponsors donated $5,500 to host the first two events
- In March of 2018, we are hosting a third event and have received another $3,000 in donations.

Ray “The Soils Guy” Archuleta

Farmers of Mill Creek Watershed Counsel

The Farmers of Mill Creek in cooperation with UW-Extension and Wood and Portage county land and water conservation depts.

Farmers of Mill Creek Goals

- Educate ourselves and our neighbors on phosphorus best management practices with the goal of improving water quality in Mill Creek.
- Focus on adopting more environmentally friendly farming practices to ensure clean water and healthy soils for future generations.
- The ultimate goal of the Farmers of Mill Creek Watershed Council is to be stewards of environmental sustainability for our land and water in our watershed.

Council Members

John Eron
715-498-5222

Kyle Altmann
715-498-0024

Mike Berdan
715-486-6190

Tyler Bulgrin
715-897-1242

Jim Coenen
715-213-4450

Abraham Guzman
715-347-4607

Brian Otto
715-204-0521

Pat Slattery
715-570-3596

Jeff Wiernik
715-630-8836

Ken Schroeder
Portage County
UW-Extension
Agriculture Agent
715-346-1316

Extension
UNIVERSITY OF WISCONSIN–MADISON
PORTAGE COUNTY

FMCWC Conservation 2019 Incentives

The funding for these incentives comes from a Wisconsin Department of Agriculture, Trade and Consumer Protection 2019 Producer-Led Watershed Protection Grant. Funding is limited and will be first-come, first-served.

This project continues to evolve. We'd appreciate any feedback you might have about other incentives you would be interested in.

Single Species Cover Crops (DATCP grant)

- **$25** *per acre if planted before Sept 10.*
- **$20** *per acre if planted after Sept 10 but before Oct 10.*
- **$15** *per acre if planted after October 10.*

Potential exists for additional cost-share money from County Land and Water Conservation Dept. funds.

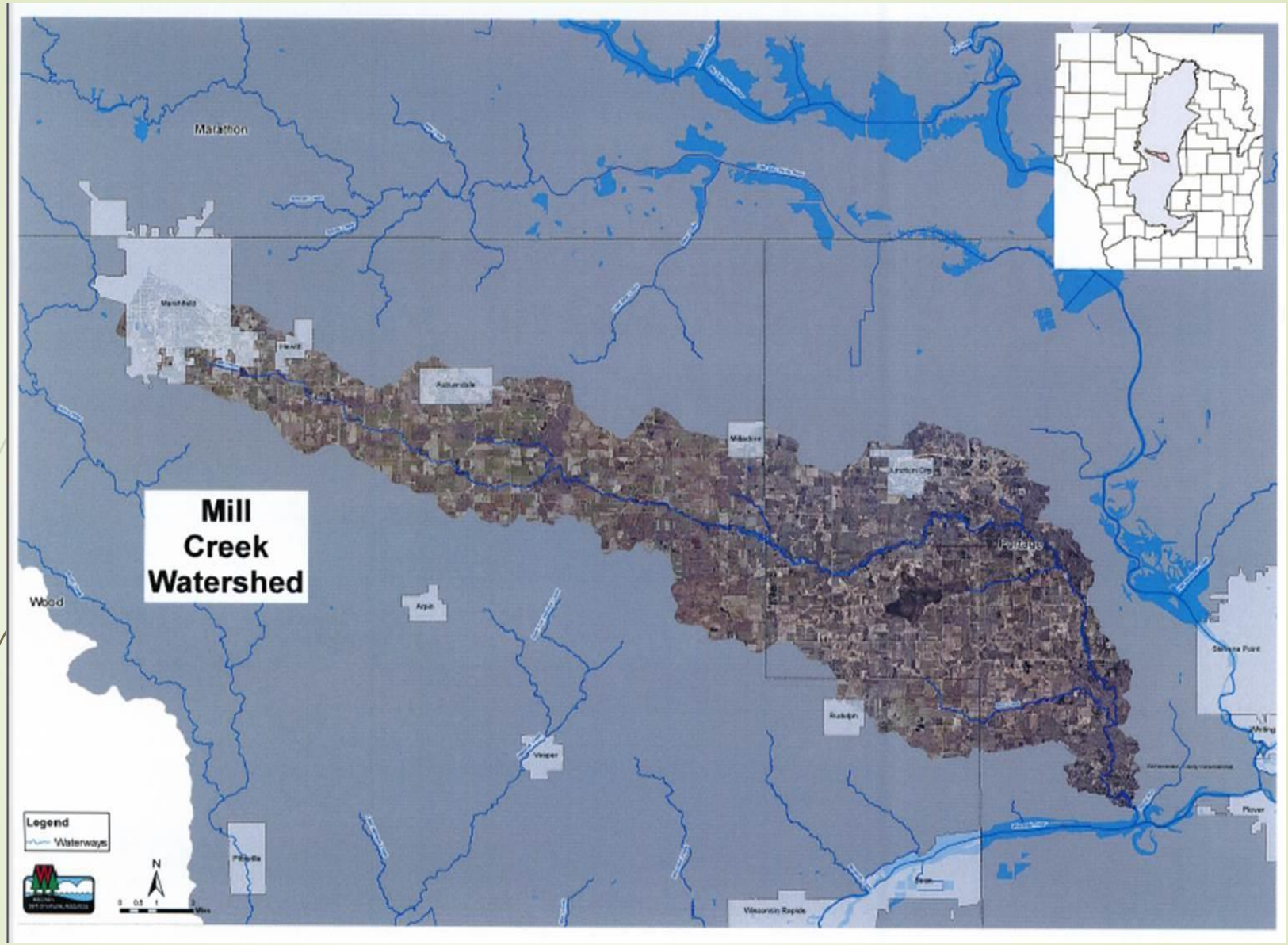
$25 per acre (DATCP grant) to plant multi-species cover crops. Potential exists for additional cost-share money from County Land and Water Conservation Dept. funds. No-till drill available for rent from Wood County Land & Water (see article on page 9.)

$15 per acre (DATCP grant) to try no-till planting. The intent is to encourage no-till on new parcels. Potential exists for additional cost-share money from County Land and Water Conservation Dept. funds.

$100 per acre (DATCP grant) for installation and maintenance of buffer strips along Mill Creek, including in-field waterway buffers. Potential exists for additional cost-share money from County Land & Water Conservation Dept. funds.

"My grandfather used to say that once in your life you need a doctor, a lawyer, a policeman, and a preacher but every day, three times a day, you need a farmer."

~ ~ Brenda Schoepp ~ ~



47 miles long
165 sq. mi.
105,600 acres

June 24 July 28

Soil & Water Resource Management Program

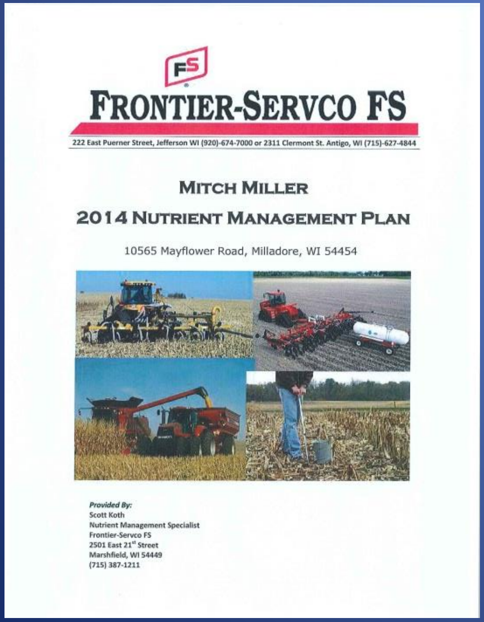
This grant from the Department of Agriculture, Trade, and Consumer Protection provides funds to carry out soil and water conservation activities that include providing cost share assistance to landowners to install best management practices throughout Wood County. The goal is to reduce sediment and nutrient runoff and to improve water quality in the lakes, streams, and drinking water of Wood County. With an approved Land and Water Resource Management Plan the LCD receives grant funds to hire staff to implement the LWRM plan. SWRM funds are available to pay for salaries, support costs, and to provide cost sharing to landowners. This is a continuing grant. This program provides funding to the equivalent of 1.6 FTE positions to support carrying out our soil and water protection. To reduce this effort would really effect the local producers who rely heavily on our technical expertise. This is a state mandated program.

Barnyard Runoff Control Systems


Barnyards Installed 25
Roof Runoff Systems Installed 45

Well Closures Completed 28

Nutrient Management Plans Completed 85



FRONTIER-SERVCO FS

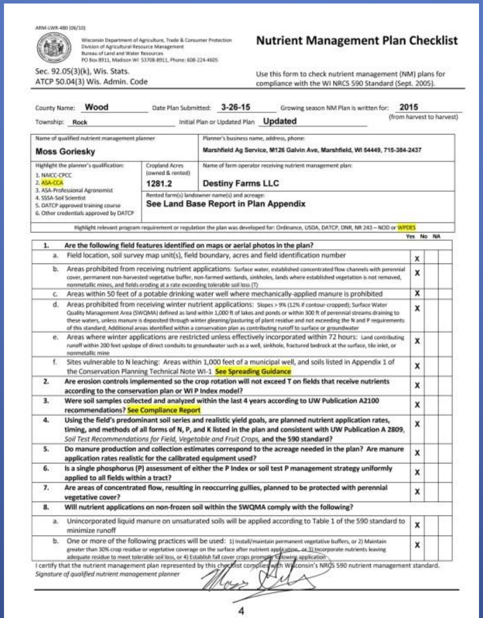
222 East Puerner Street, Jefferson WI (920)-674-7000 or 2311 Clermont St. Antigo, WI (715)-627-4844

MITCH MILLER

2014 NUTRIENT MANAGEMENT PLAN

10565 Mayflower Road, Milladore, WI 54454

Provided By:
Scott Koth
Nutrient Management Specialist
Frontier-Servco FS
2501 East 21st Street
Marshfield, WI 54449
(715) 387-1211



ARM-LWR-480 (06/10)

Wisconsin Department of Agriculture, Trade & Consumer Protection
Division of Agricultural Resource Management
Bureau of Land and Water Resources
PO Box 8911, Madison WI 53708-8911, Phone: 608-224-4605

Sec. 92.05(3)(k), Wis. Stats.
ATCP 50.04(3) Wis. Admin. Code

Nutrient Management Plan Checklist

Use this form to check nutrient management (NM) plans for compliance with the WI NRCS 590 Standard (Sept. 2005).

County Name: **Wood** Date Plan Submitted: **3-26-15** Growing season NM Plan is written for: **2015** (from harvest to harvest)

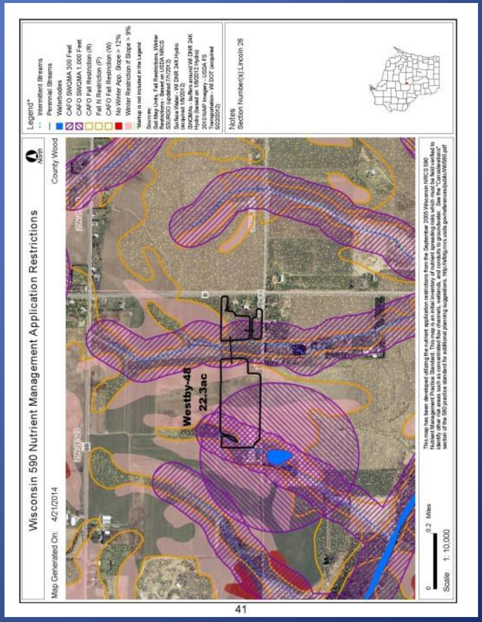
Township: **Rock** Initial Plan or Updated Plan **Updated**

Name of qualified nutrient management planner **Moss Goriesky**		Planner's business name, address, phone: **Marshfield Ag Service, M126 Galvin Ave, Marshfield, WI 54449, 715-384-2437**
Highlight the planner's qualification: 1. NAICC-CPCC 2. ASA-CCA 3. ASA-Professional Agronomist 4. SSSA-Soil Scientist 5. DATCP approved training course 6. Other credentials approved by DATCP	Cropland Acres (owned & rented) **1281.2**	Name of farm operator receiving nutrient management plan: **Destiny Farms LLC**
	Rented farm(s) landowner name(s) and acreage: **See Land Base Report in Plan Appendix**	
Highlight relevant program requirement or regulation the plan was developed for: Ordinance, USDA, DATCP, DNR, NR 243 – NOD or WPDES		

		Yes	No	NA
1.	**Are the following field features identified on maps or aerial photos in the plan?**			
a.	Field location, soil survey map unit(s), field boundary, acres and field identification number	X		
b.	Areas prohibited from receiving nutrient applications: Surface water, established concentrated flow channels with perennial cover, permanent non-harvested vegetative buffer, non-farmed wetlands, sinkholes, lands where established vegetation is not removed, nonmetallic mines, and fields eroding at a rate exceeding tolerable soil loss (T)	X		
c.	Areas within 50 feet of a potable drinking water well where mechanically-applied manure is prohibited	X		
d.	Areas prohibited from receiving winter nutrient applications: Slopes > 9% (12% if contour-cropped); Surface Water Quality Management Area (SWQMA) defined as land within 1,000 ft of lakes and ponds or within 300 ft of perennial streams draining to these waters, unless manure is deposited through winter gleaning/pasturing of plant residue and not exceeding the N and P requirements of this standard; Additional areas identified within a conservation plan as contributing runoff to surface or groundwater	X		
e.	Areas where winter applications are restricted unless effectively incorporated within 72 hours: Land contributing runoff within 200 feet upslope of direct conduits to groundwater such as a well, sinkhole, fractured bedrock at the surface, tile inlet, or nonmetallic mine	X		
f.	Sites vulnerable to N leaching: Areas within 1,000 feet of a municipal well, and soils listed in Appendix 1 of the Conservation Planning Technical Note WI-1 See Spreading Guidance	X		
2.	**Are erosion controls implemented so the crop rotation will not exceed T on fields that receive nutrients according to the conservation plan or WI P Index model?**	X		
3.	**Were soil samples collected and analyzed within the last 4 years according to UW Publication A2100 recommendations? See Compliance Report**	X		
4.	**Using the field's predominant soil series and realistic yield goals, are planned nutrient application rates, timing, and methods of all forms of N, P, and K listed in the plan and consistent with UW Publication A 2809,** *Soil Test Recommendations for Field, Vegetable and Fruit Crops,* **and the 590 standard?**	X		
5.	**Do manure production and collection estimates correspond to the acreage needed in the plan? Are manure application rates realistic for the calibrated equipment used?**	X		
6.	**Is a single phosphorus (P) assessment of either the P Index or soil test P management strategy uniformly applied to all fields within a tract?**	X		
7.	**Are areas of concentrated flow, resulting in reoccurring gullies, planned to be protected with perennial vegetative cover?**	X		
8.	**Will nutrient applications on non-frozen soil within the SWQMA comply with the following?**			
a.	Unincorporated liquid manure on unsaturated soils will be applied according to Table 1 of the 590 standard to minimize runoff	X		
b.	One or more of the following practices will be used: 1) Install/maintain permanent vegetative buffers, or 2) Maintain greater than 30% crop residue or vegetative coverage on the surface after nutrient application, or 3) Incorporate nutrients leaving adequate residue to meet tolerable soil loss, or 4) Establish fall cover crops promptly following application	X		

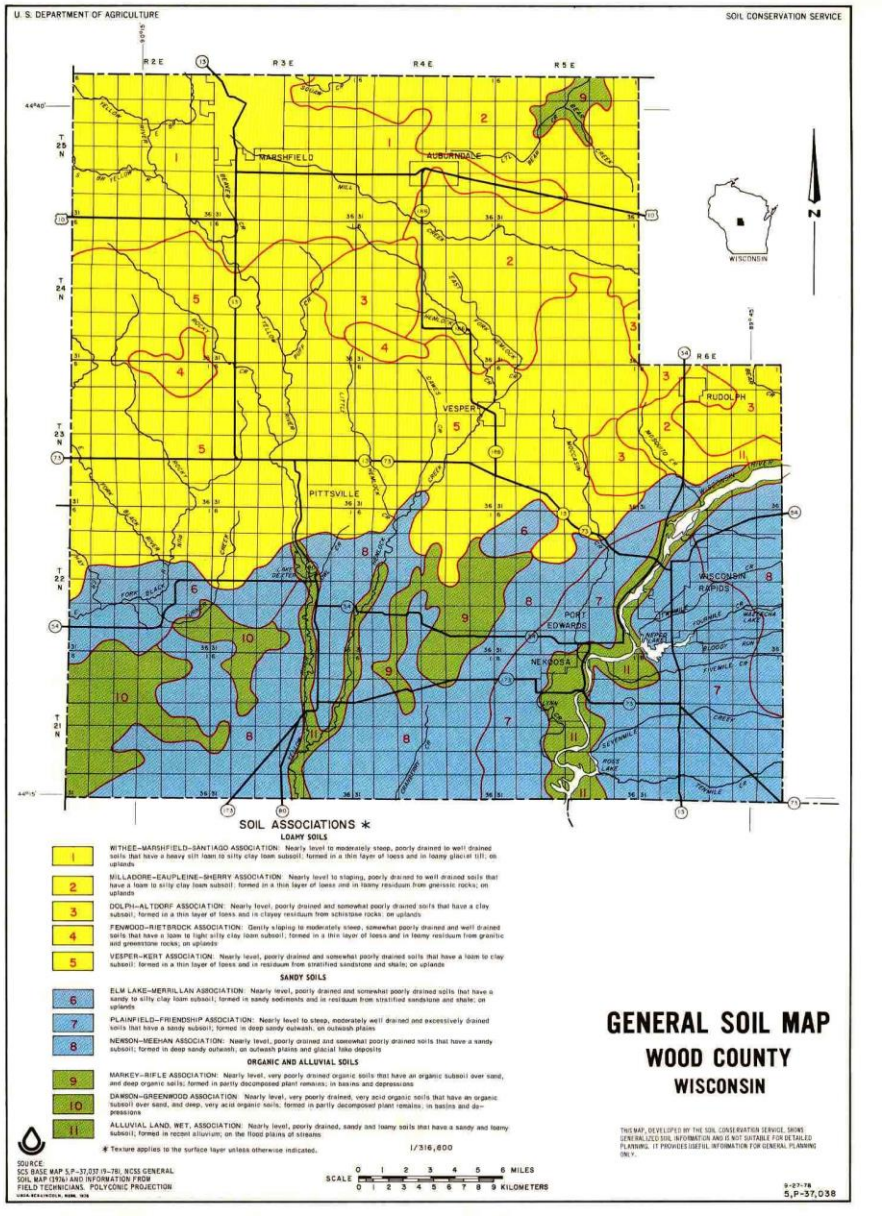
I certify that the nutrient management plan represented by this checklist complies with Wisconsin's NRCS 590 nutrient management standard.
Signature of qualified nutrient management planner

4



LAND AND WATER RESOURCE MANAGEMENT PLAN

February 2015



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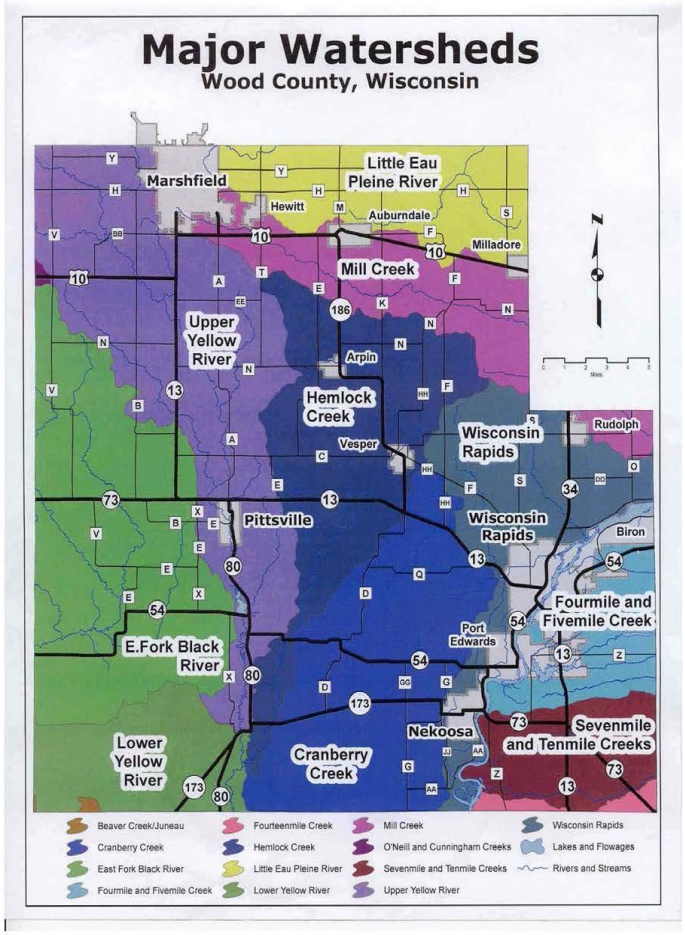
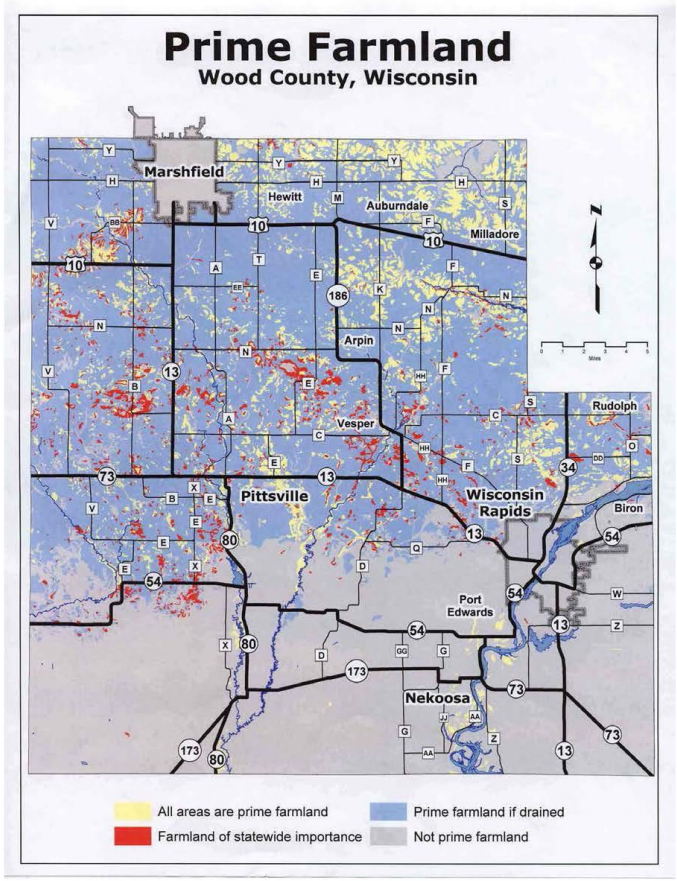

Major Watersheds
Wood County, Wisconsin
Marshfield
Little Eau Pleine River
Hewitt
Auburndale
Milladore
Mill Creek
Upper Yellow River
Arpin
Hemlock Creek
Vesper
Rudolph
Wisconsin Rapids
Pittsville
Biron
Fourmile and Fivemile Creek
Port Edwards
E.Fork Black River
Nekoosa
Sevenmile and Tenmile Creeks
Lower Yellow River
Cranberry Creek
Beaver Creek/Juneau
Cranberry Creek
East Fork Black River
Fourmile and Fivemile Creek
Fourteenmile Creek
Hemlock Creek
Little Eau Pleine River
Lower Yellow River
Mill Creek
O'Neill and Cunningham Creeks
Sevenmile and Tenmile Creeks
Upper Yellow River
Wisconsin Rapids
Lakes and Flowages
Rivers and Streams

(2-3)


Prime Farmland
Wood County, Wisconsin
Marshfield
Hewitt
Auburndale
Milladore
Arpin
Vesper
Rudolph
Pittsville
Wisconsin Rapids
Biron
Port Edwards
Nekoosa
All areas are prime farmland
Prime farmland if drained
Farmland of statewide importance
Not prime farmland

Animal Waste Storage And Groundwater Protection Ordinance 801

Provides administration of the ordinance to regulate the location, design, construction, installation, alteration, abandonment, and use of animal waste and manure storage facilities and the application of waste and manure from all storage facilities covered by the ordinance in order to prevent surface and groundwater pollution. This ordinance was required to be adopted by the Wood County Board as a condition to participating in the State funded Upper Yellow River Priority Watershed Project and to meet State Statutes outlined in ATCP 50. The LWCD administers this ordinance utilizing both county tax levy and state SWRM grant funds. The ordinance is essential to protect ground water for County Residents. This is a state mandated program.

Waste Storage Facilities Active	**238**
Waste Storage Facilities Closed	**14**
Waste Storage Facilities Idle	**3**

AWO Violations

TMDL Project Update

Shane Wucherpfennig
Wood County Land & Water Conservation Department

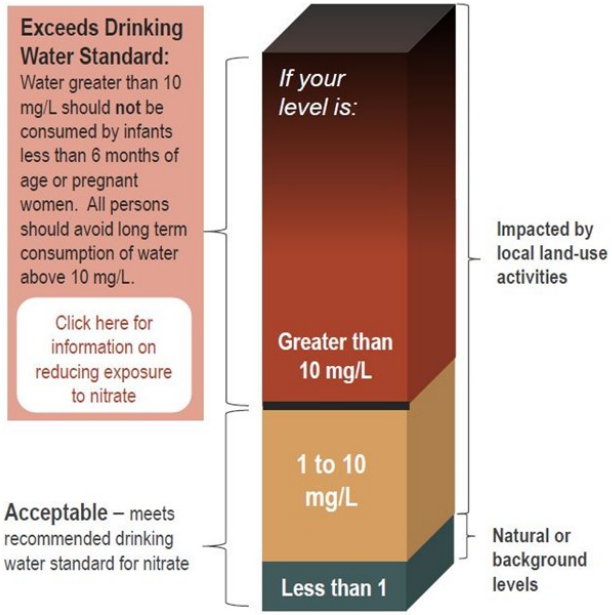
Wisconsin River Basin Water Quality Improvement Project

General Information:
Nitrogen from fertilizers, animal wastes, septic systems, and other bio-solids breaks down into nitrate, a very mobile form of nitrogen. Nitrate is a health concern but is also a good indicator of whether nearby land-uses are impacting your well water quality.

Health Concerns:
Methemoglobinemia in infants under 6 months of age. Infants with this condition need immediate medical care. Possible links to birth defects, miscarriages and various cancers.

Additional Information:
Every well should have their water tested for nitrate at least once, more often if you live within 1/4 mile of an agricultural field where fertilizers, animal wastes or other bio-solids are applied.

In general, shallow wells and wells with short or cracked casings have the highest risk of contamination: however, deep wells are also at risk in some areas.



WOOD COUNTY
LAND AND WATER
CONSERVATION
DEPARTMENT

Wood County Land and Water Conservation Department
111 West Jackson Street
Wisconsin Rapids, WI 54495
(715)421-8475

Proposed Private Well Water Sampling Program

2019

Why Should I Test My Well?

As one of Wisconsin's 900,000 private well owners or private well water consumers, you probably use groundwater for doing your family's laundry, drinking, cooking, bathing and watering your garden.

Municipalities are required to test their water supplies regularly to ensure the water is safe to drink. Since there is no requirement to test a private well except for bacteria when it is first drilled or the pump is changed, you are responsible for making sure your water is safe.

Most private wells provide a clean, safe supply of water; however, contaminants can pollute private wells, and unfortunately you cannot see, smell or taste most of them. Consequently, you should test your water on a regular basis. The decision on what to test your water for should be based on the types of land uses near your well. Am I or my family at risk?

A 2001 random survey of Wisconsin domestic wells found nitrate above the 10 parts per million (ppm) standards in 14% of the wells. Forty-eight percent had nitrate above 2 ppm.

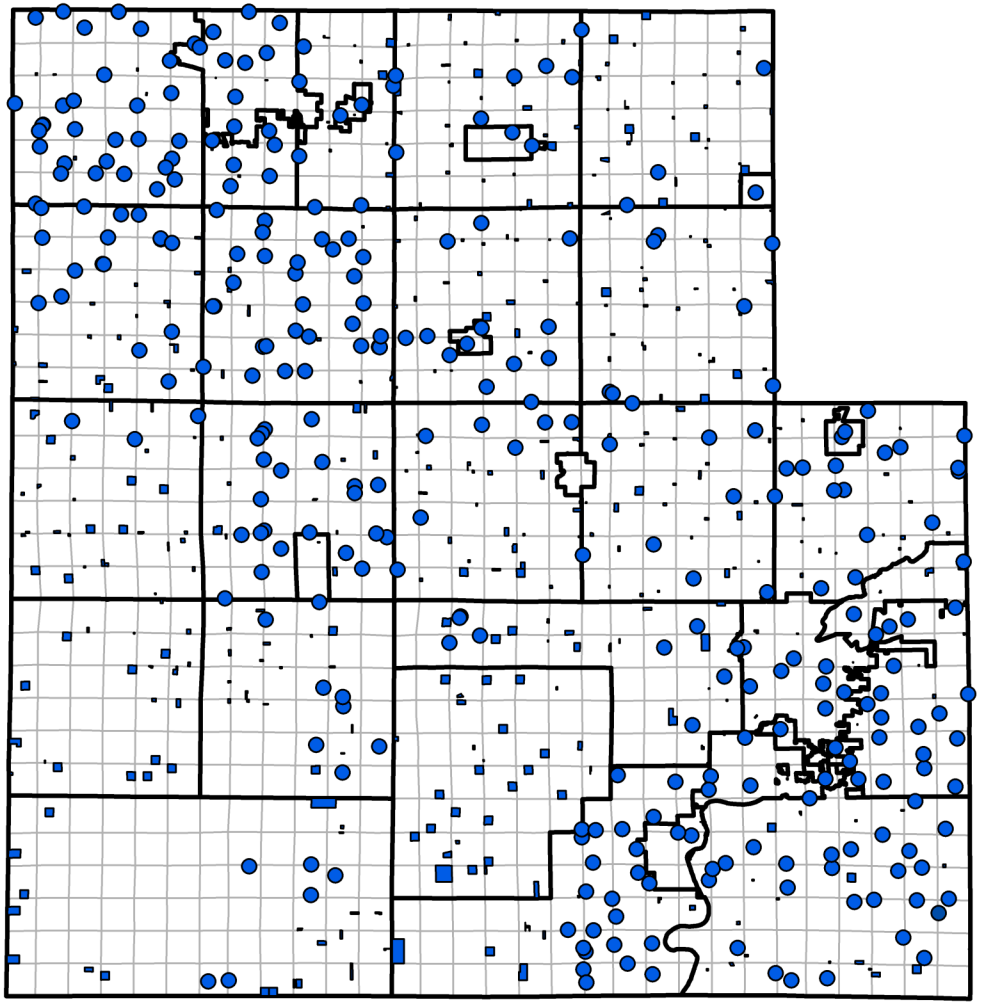
Sampling Effort in 2018

Wood & Juneau County Health Department coordinated a water sampling effort in the spring of 2018 in the Port Edwards/Armenia areas and offered reduced costs to sample private wells. From the collective well sampling results came back at a staggering 42% of wells testing above 10 ppm Nitrate, which is the State drinking water standard. Many of the wells had levels in the 20's, 30's & even 40 ppm. This is very alarming.

Wood County Land and Water & Wood County Health have been partnering up to combine datasets for the purpose of offering a County Wide water sampling effort to County resident at no charge. The Land and Water Conservation has been preparing a map with well locations identified which will target a minimum of one well per section in all of the 22 townships in Wood County.

- The following would outline a budget for the cost associated with the County Wide sampling effort:
- 22 Townships (36 sections per township -1 with 72) = 828 sections – 828 private wells
- 828 sections @ $10.00 per sample run through Wood County Health Nitrate lab = Total Cost $ 8,280
- If the effort was split into two years the cost would be 414 wells @ $10.00 per sample = $4,140 per year for two years.

Due to the fact that some areas of the County have very low population and low residency these numbers may vary. Once LWCD completes the map work and mail list, we will have a more true count.

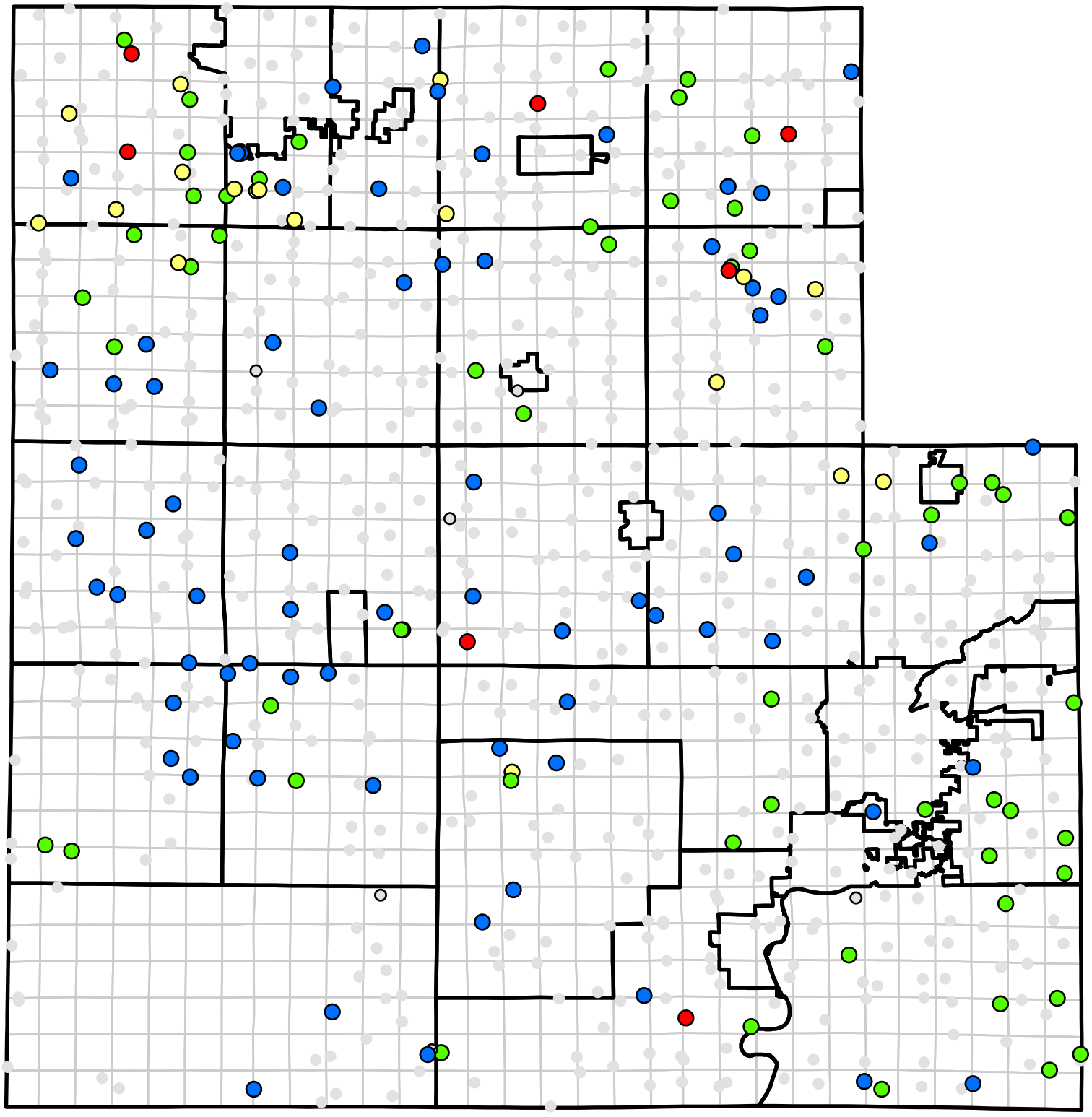


The map to the left is a visual what the well sampling could look like . The map breaks down Wood County into corporate limits and then further into 1x1 mile sections.

Most sections have a point or a parcel highlighted in blue. The point indicates a well that has been tested in the past. If a section didn't have a well tested in the past, a parcel was selected randomly. Some sections didn't have any obvious signs of having a drinking well.

Nitrate Test Results

(as of 6-6-2019)

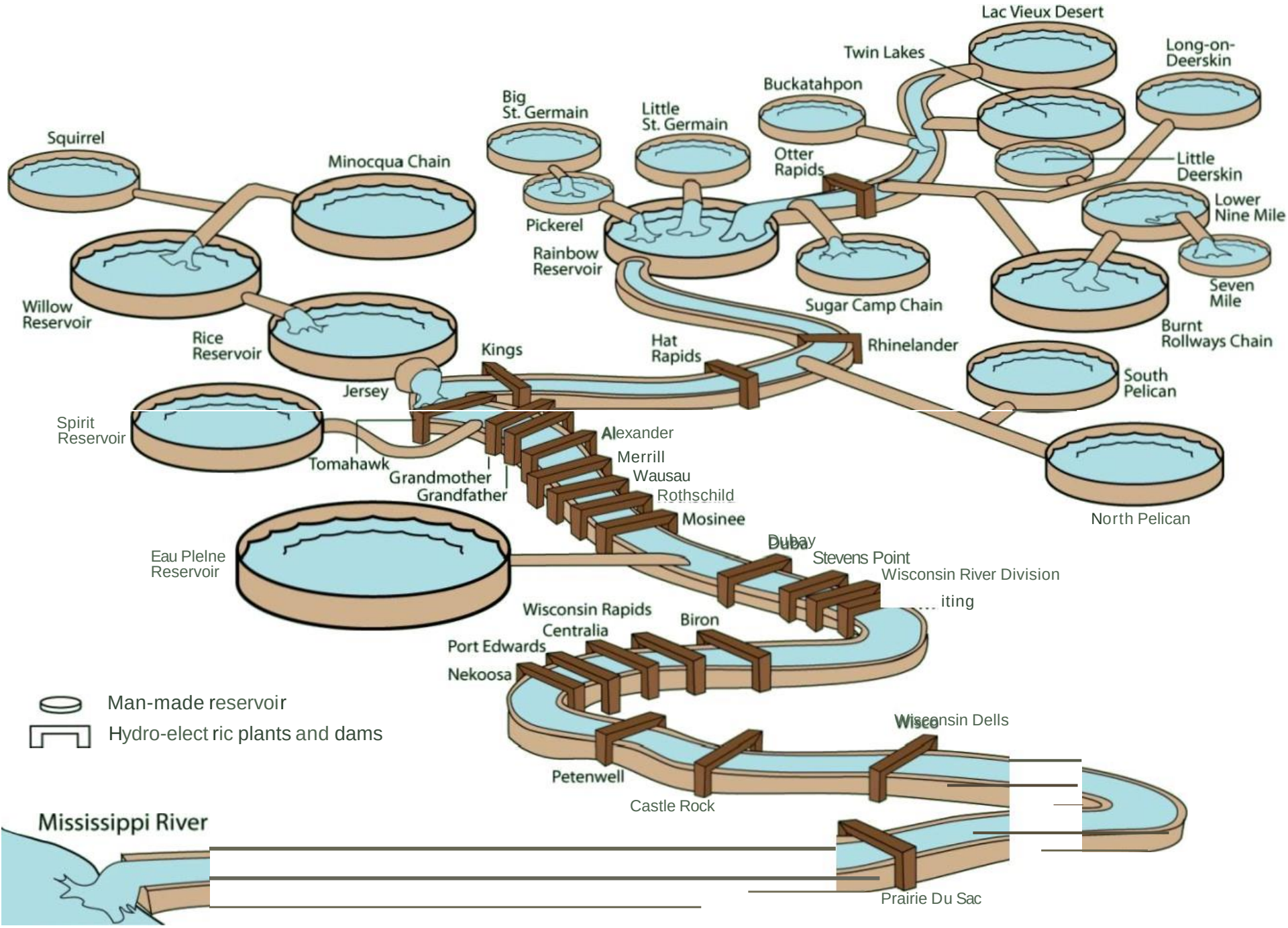


Nitrate Testing Results

- Below Detection Limit (73)
- Less than 5 ppm (57)
- Between 5-10 ppm (18)
- Greater than 10 ppm (7)
- No Response

The Wisconsin River Basin (WRB) Water Quality Improvement Project

WISCONSIN
DEPT. OF NATURAL RESOURCES


Lac Vieux Desert
Twin Lakes
Long-on-Deerskin
Buckatahpon
Big St. Germain
Little St. Germain
Squirrel
Minocqua Chain
Otter Rapids
Little Deerskin
Lower Nine Mile
Pickerel
Rainbow Reservoir
Seven Mile
Sugar Camp Chain
Willow Reservoir
Rice Reservoir
Burnt Rollways Chain
Kings
Hat Rapids
Rhinelander
South Pelican
Jersey
Spirit Reservoir
Alexander
Merrill
Tomahawk
Wausau
Grandmother
Grandfather
Rothschild
Mosinee
North Pelican
Eau Plelne Reservoir
Dubay
Stevens Point
Wisconsin River Division
Wisconsin Rapids
Biron
Centralia
Port Edwards
Nekoosa
Petenwell
Castle Rock
Prairie Du Sac
Mississippi River
Man-made reservoir
Hydro-electric plants and dams


Castle
Rock


Lake
Wisconsin

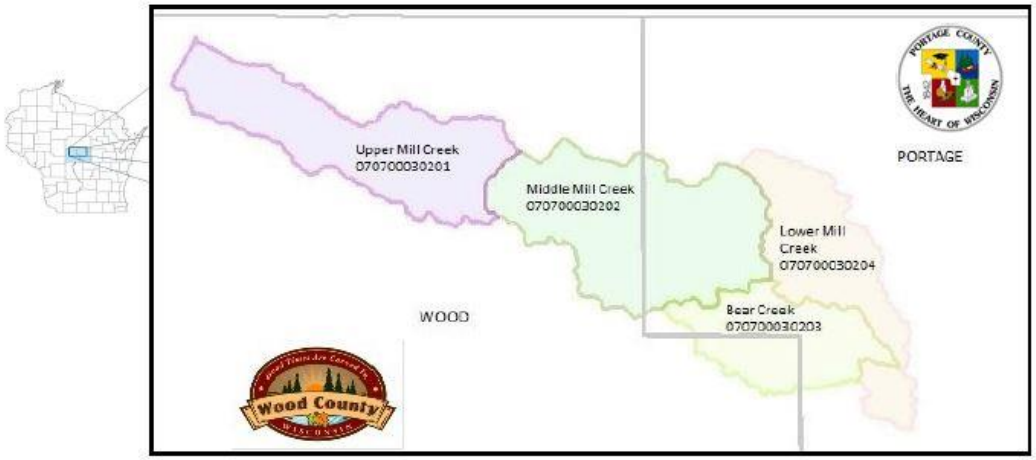

Lake
DuBay


Petenwell

MILL CREEK

WATERSHED MANAGEMENT PLAN

Hydrologic Unit Code (HUC) 0707000302



In Support of the

MILL CREEK
WATERSHED PROJECT

"9 Key Elements" for Watershed-Based Plans

EPA Nonpoint Source (Section 319) Program

1. An identification of the **causes and sources** or groups of similar sources that will need to be controlled to achieve the load reductions estimated in the watershed-based plan (and to achieve any other watershed goals identified in the watershed-based plan), as discussed in item (2) immediately below. 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 a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).

2. An estimate of the **load reductions expected for the management measures** described under paragraph (3) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (1) above (e.g., the total load reduction expected for dairy cattle feedlots; row crops; or eroded streambanks).

3. A description of the **NPS management measures** that will need to be implemented to achieve the load reductions estimated under paragraph (2) above (as well as to achieve other watershed goals identified in the watershed-based plan), and an identification (using a map or a description) of the critical areas in which those measures will be needed to implement the plan.

4. 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 the plan.

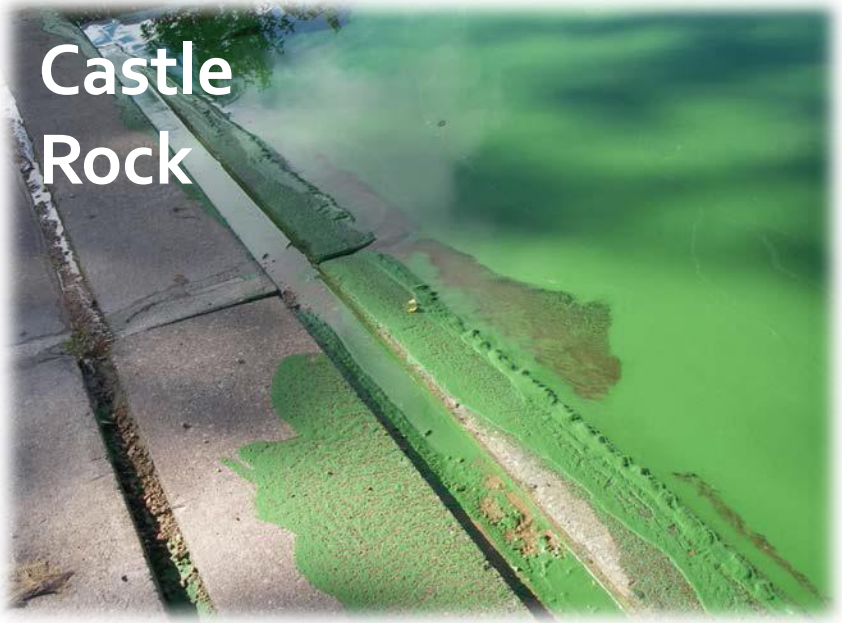
5. An **information/education** component that will be used to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, and implementing the NPS management measures that will be implemented.

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

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

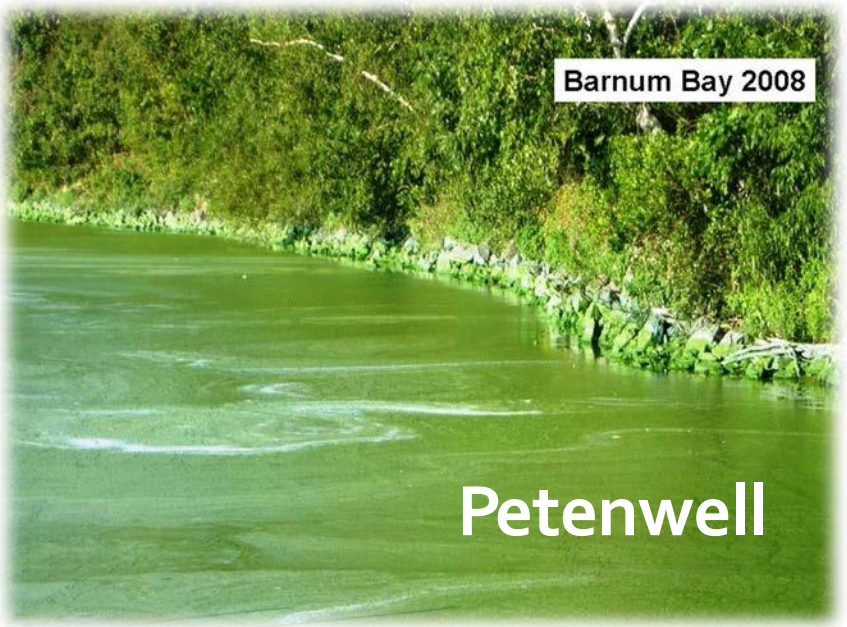
8. A set of **criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made towards attaining water quality standards** and, if not, the criteria for determining whether the plan needs to be revised or, if a NPS TMDL has been established,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

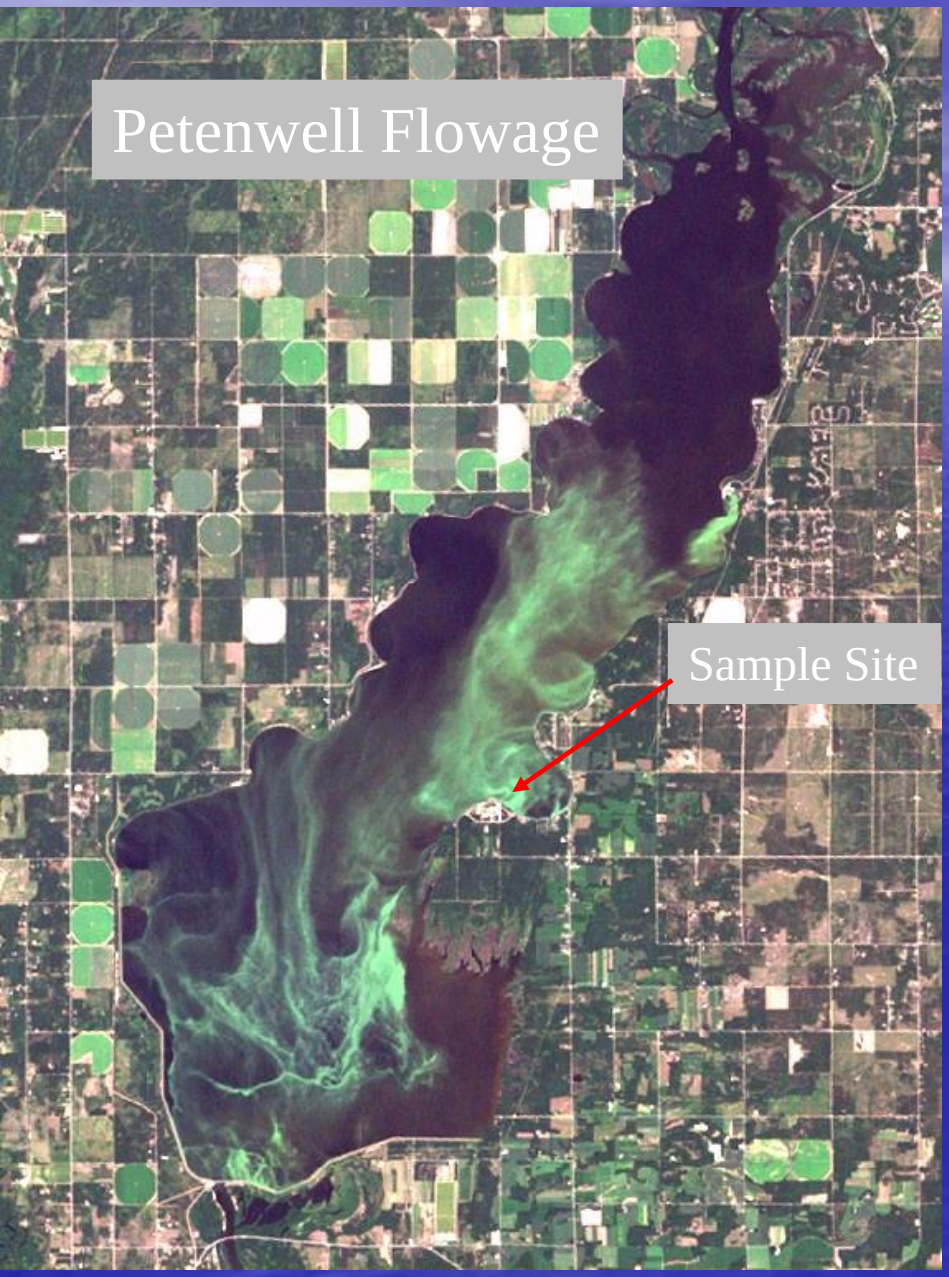
9. A **monitoring** component to evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (8) immediately above.

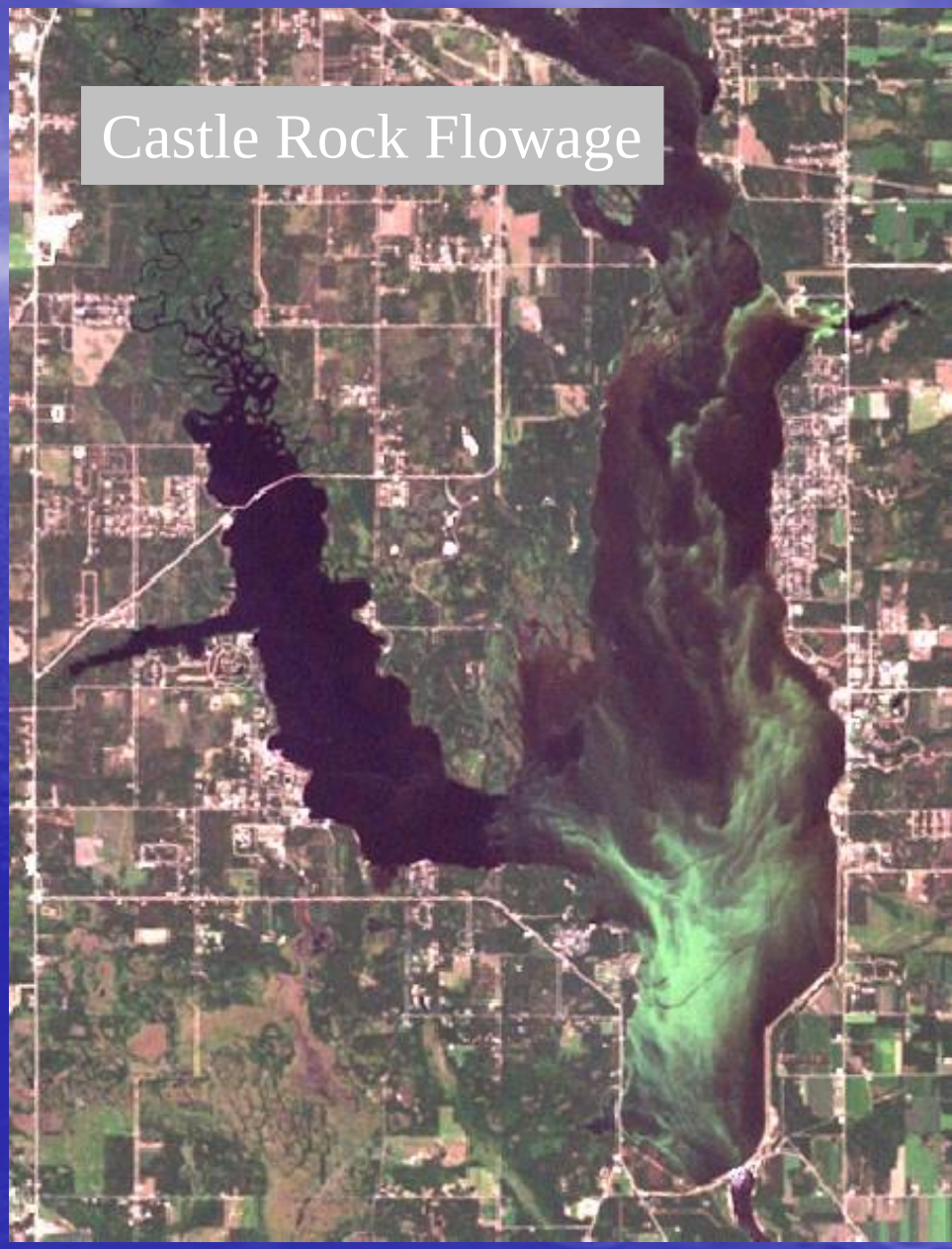

Castle
Rock


Lake
Wisconsin


Lake
DuBay


Barnum Bay 2008
Petenwell


Petenwell Flowage
Sample Site


Castle Rock Flowage

TMDL Allocations & Implementation

Industrial Wastewater
Municipal Wastewater
Urban Stormwater

Rural/Agricultural
Nonpoint Source

Phosphorus

Toxic algae blooms

Public health risks

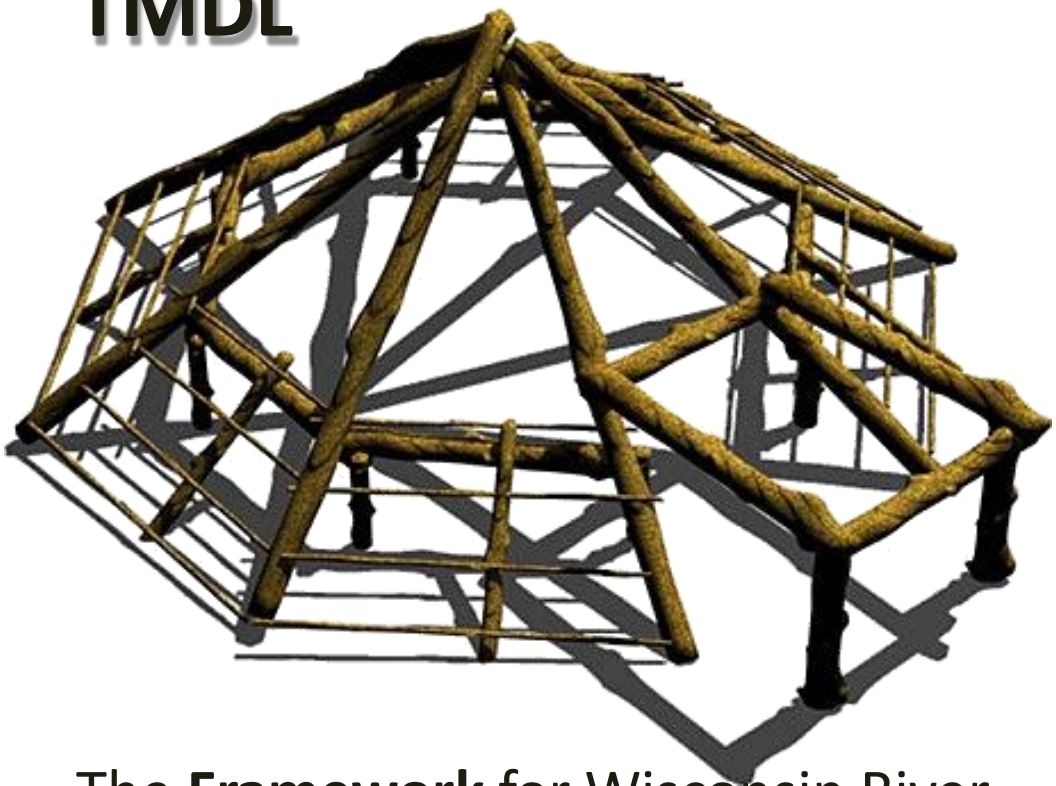
Clean Water

Fish & Wildlife

Recreation

Project Framework = Total Maximum Daily Load

TMDL



The **Framework** for Wisconsin River Basin Water Quality Improvement Project

A TMDL answers the following questions:

- How much is the existing pollutant load? What is the contribution from each source?
- How much does pollution need to be reduced in order for waterways to achieve water quality standards?
- How will the pollutant load reductions be achieved?

WISCONSIN DEPT. OF NATURAL RESOURCES

WRB Total Maximum Daily Load (TMDL)

Each subwatershed is assessed for:

Load Allocation

- Runoff from the landscape

Background Load

- Naturally occurring from wetlands, forests

Waste Load Allocation

- Municipal Wastewater
- Industrial Wastewater
- Permitted Municipal Storm Sewer Systems
- CAFO Production Areas

TMDL

Load Allocation + Waste Load Allocation + Margin of Safety

WISCONSIN DEPT. OF NATURAL RESOURCES

Why develop a TMDL?

Baseline Pollutant Load

Does not meet water quality standards

Total Maximum Daily Load

Meets water quality standards

WISCONSIN DEPT. OF NATURAL RESOURCES

Statewide Phosphorus Criteria

Rivers

100 µg/L

Streams [1]

75 µg/L

Reservoirs

- Not Stratified = 40 µg/L
- Stratified = 30 µg/L

Inland Lakes[2]

Ranges from 15-30 µg/L

Great Lakes

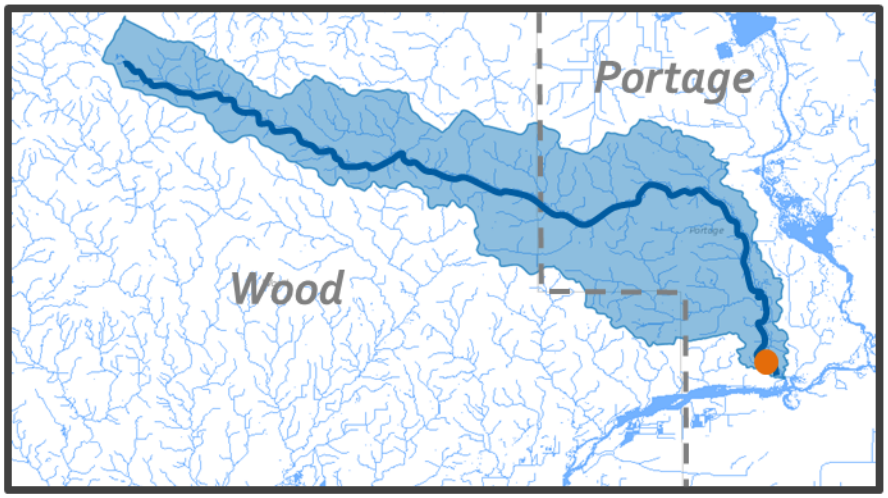
- Lake Michigan = 7 µg/L
- Lake Superior = 5 µg/L

[1] *All unidirectional flowing waters not in NR 102.06(3)(a). Excludes Ephemeral Streams.*

[2] *Excludes wetlands and lakes less than 5 acres*

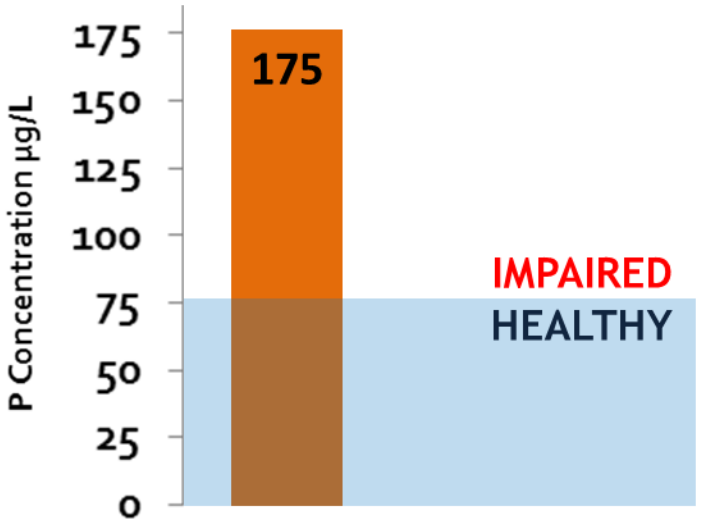
Water Quality Monitoring

2009-2013

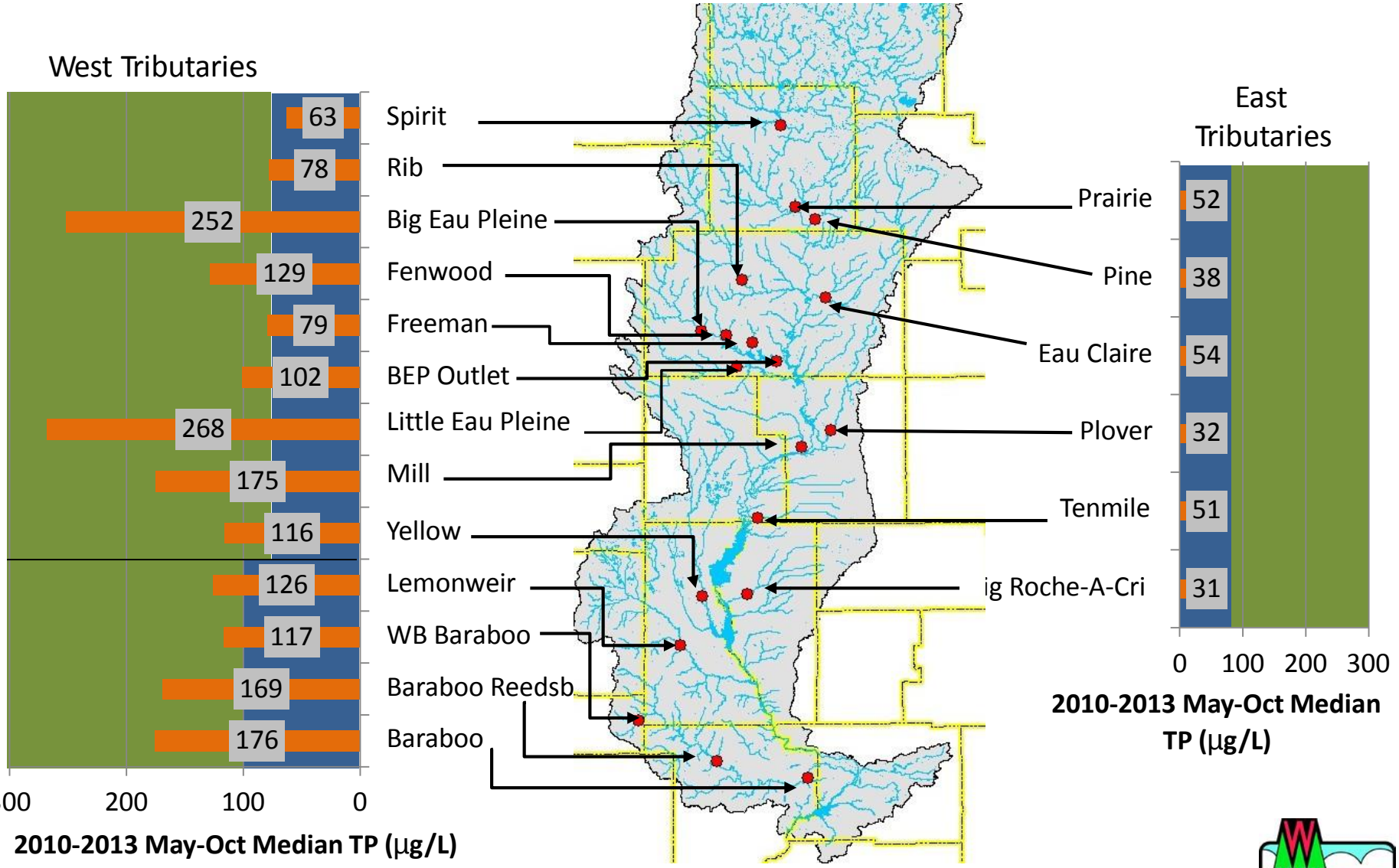


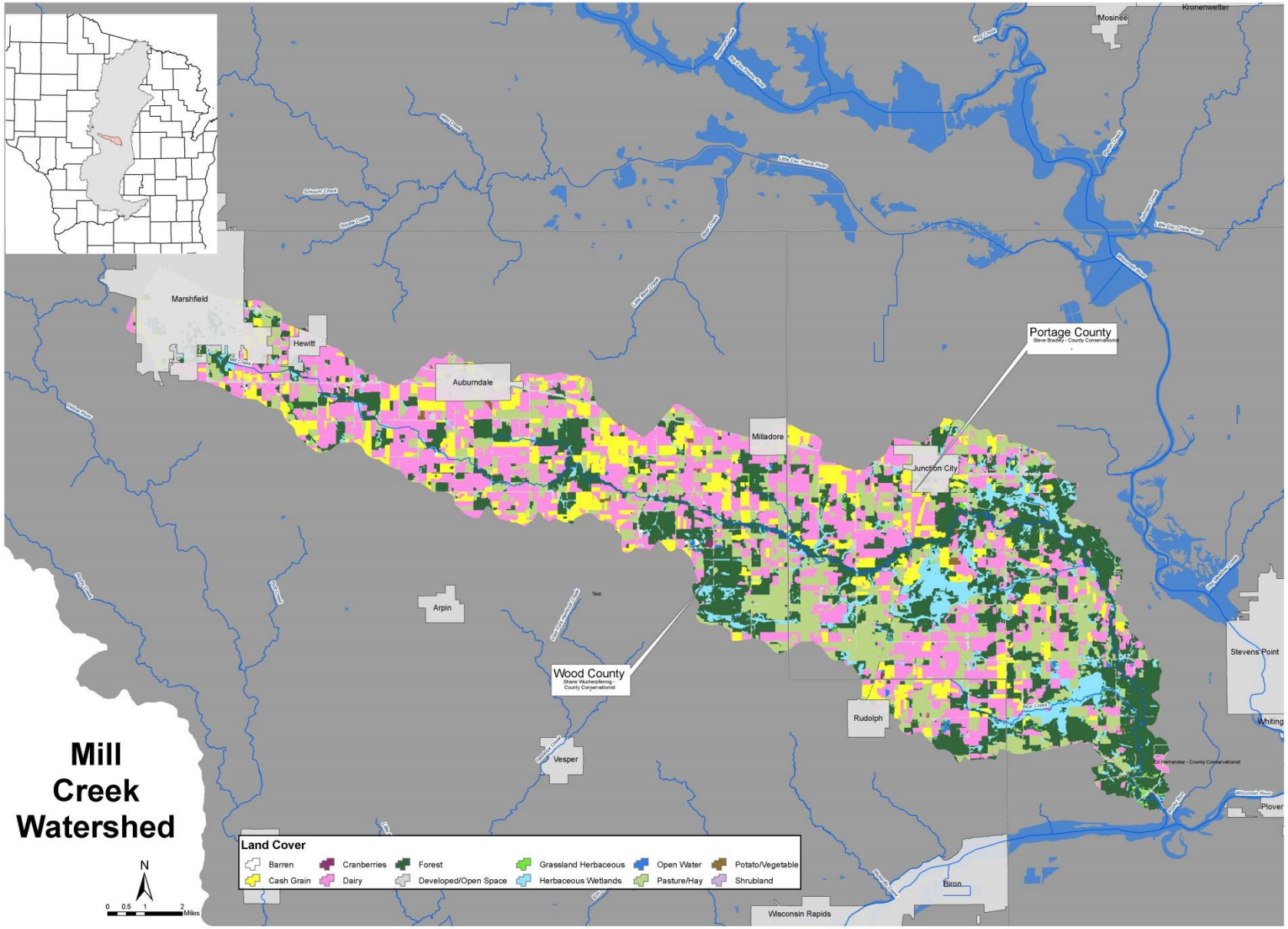
Total Phosphorus concentration µg/L

Mill Creek



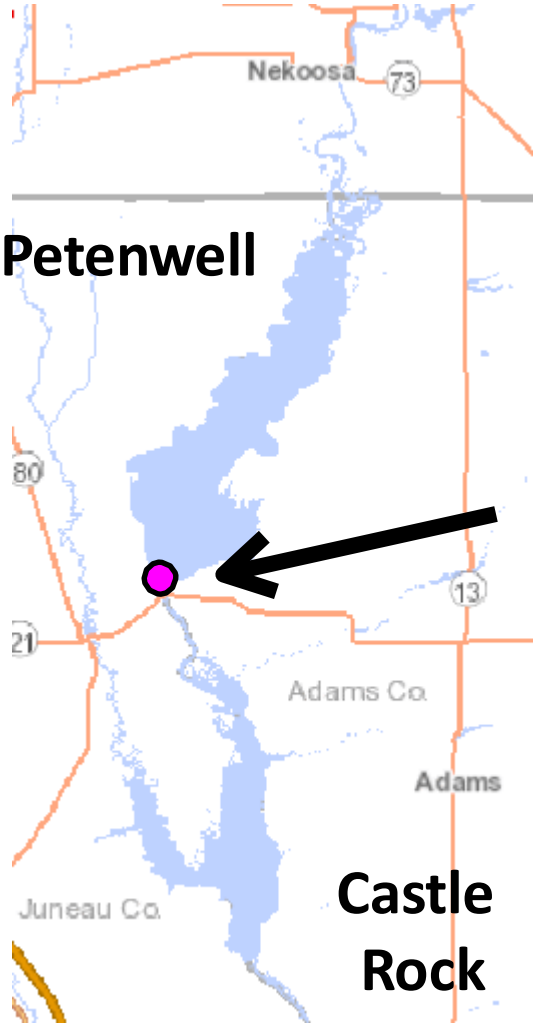
Tributary Monitoring Results – Total P Concentration




Mill Creek Watershed
Land Cover
Barren
Cash Grain
Cranberries
Dairy
Forest
Developed/Open Space
Grassland Herbaceous
Herbaceous Wetlands
Open Water
Pasture/Hay
Potato/Vegetable
Shrubland
N
0 0.5 1 2 Miles
Marshfield
Hewitt
Auburndale
Milladore
Junction City
Portage County
Steve Bradley - County Conservationist
Wood County
Shane Vischetti - County Conservationist
Arpin
Vesper
Rudolph
Stevens Point
Whiting
Plover
Biron
Wisconsin Rapids
Mosinee
Kronenwetter

Total Monthly Phosphorus Loads (lbs)

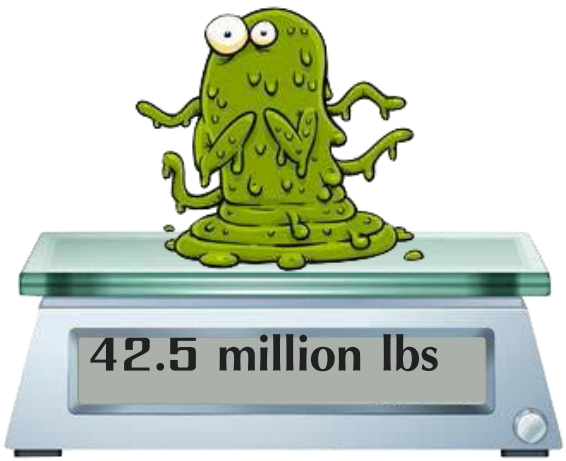
@ Petenwell Dam monitoring site



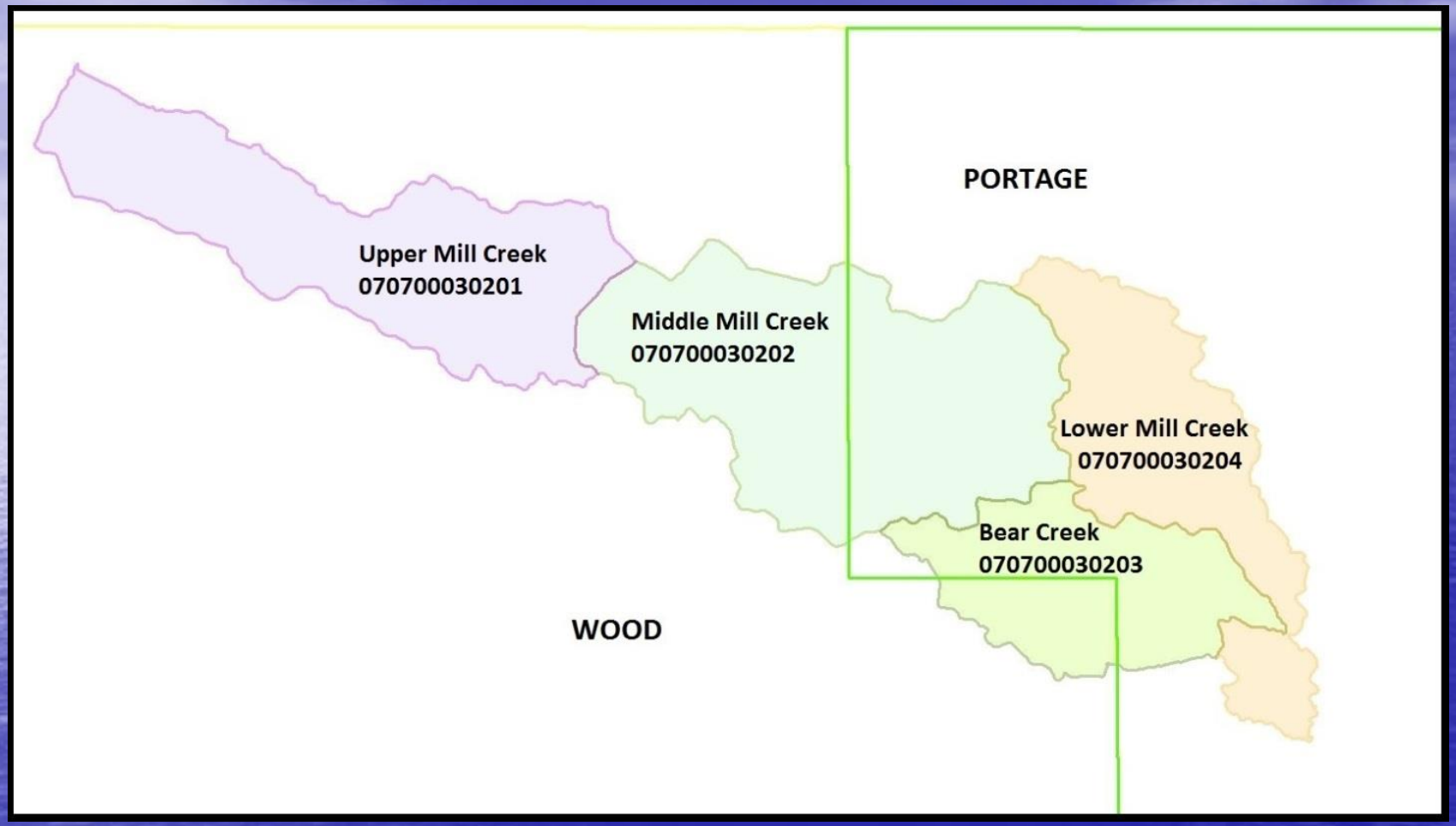
August 2011

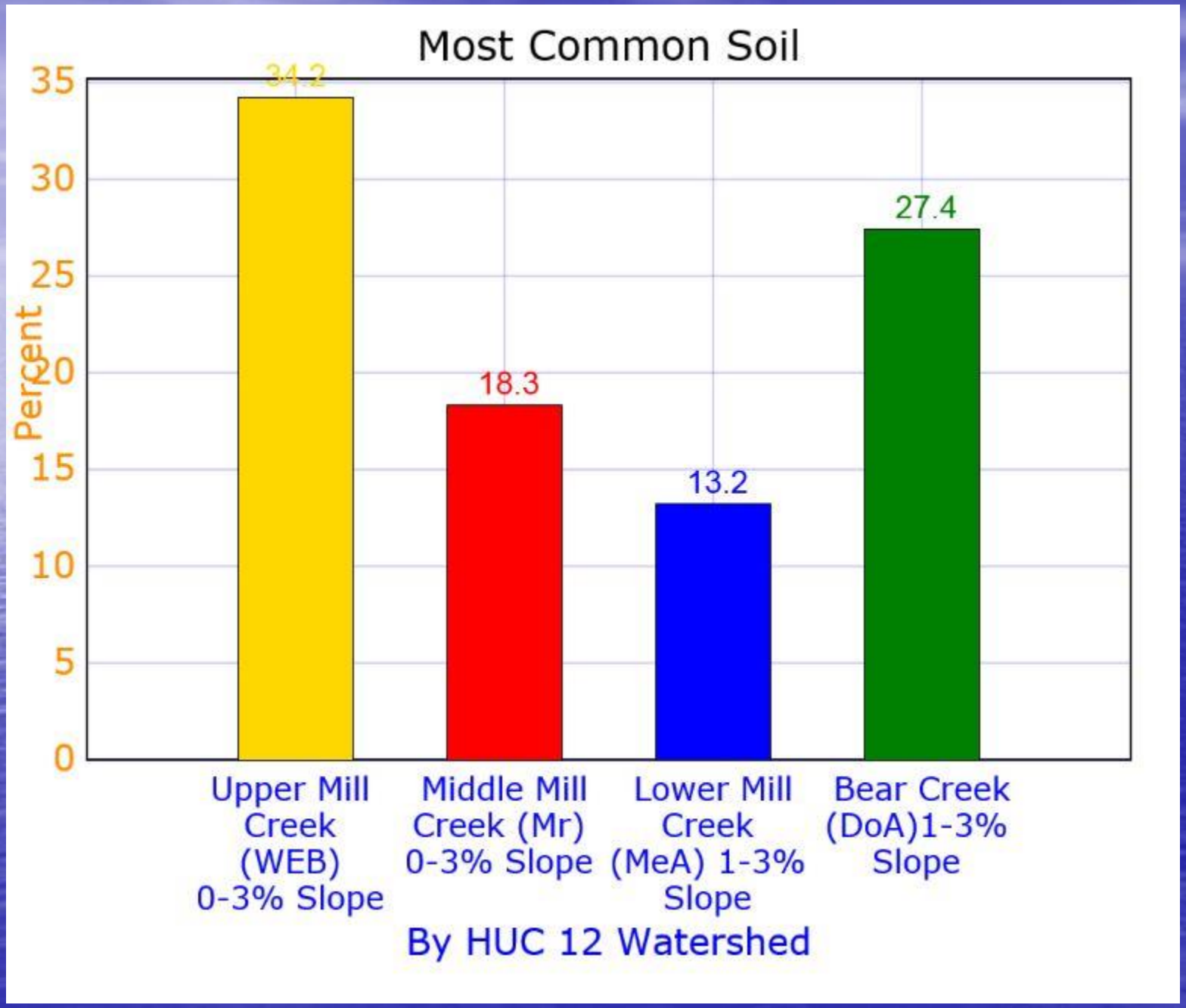
85,000 lbs P

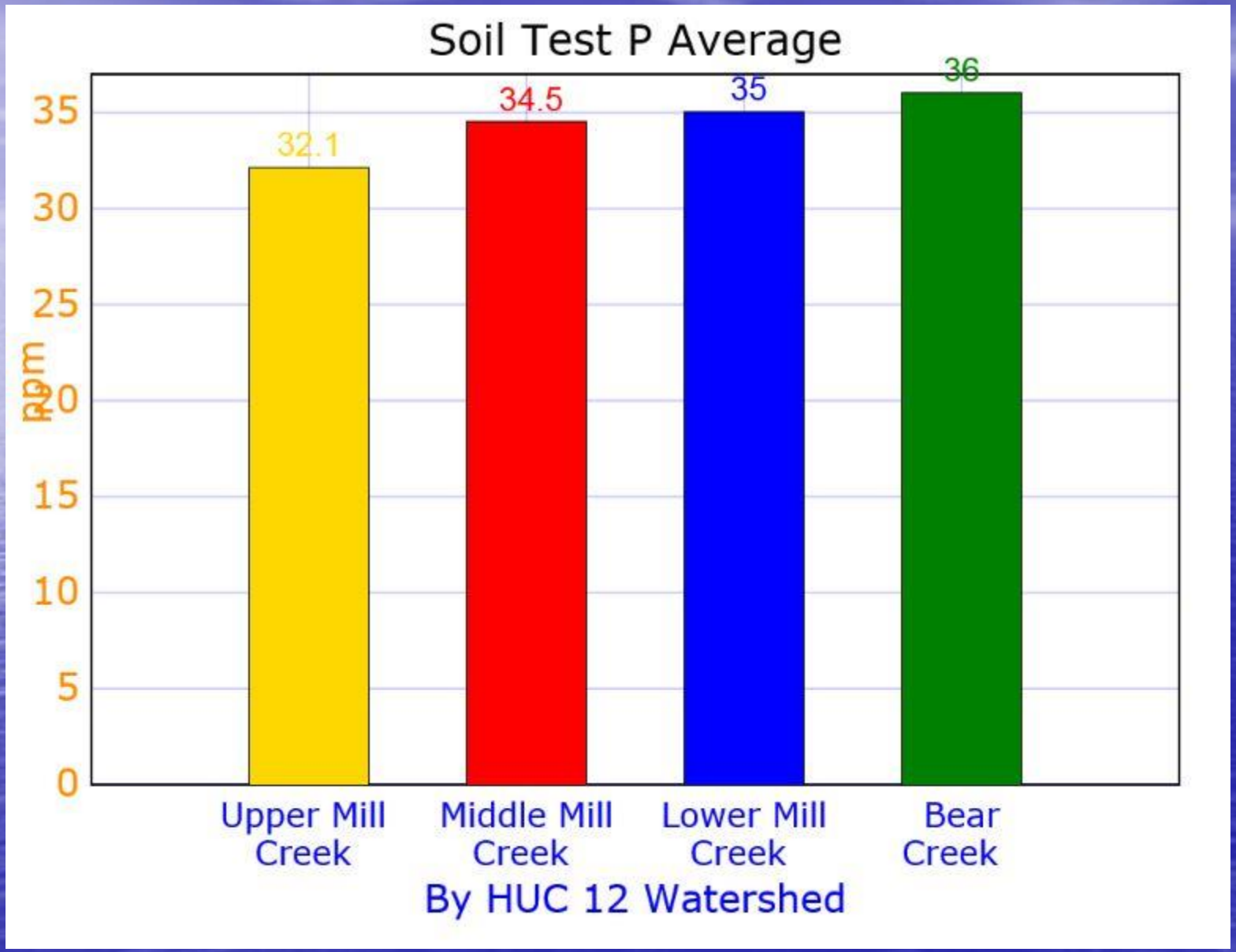
1 lb P : 500 lbs algae

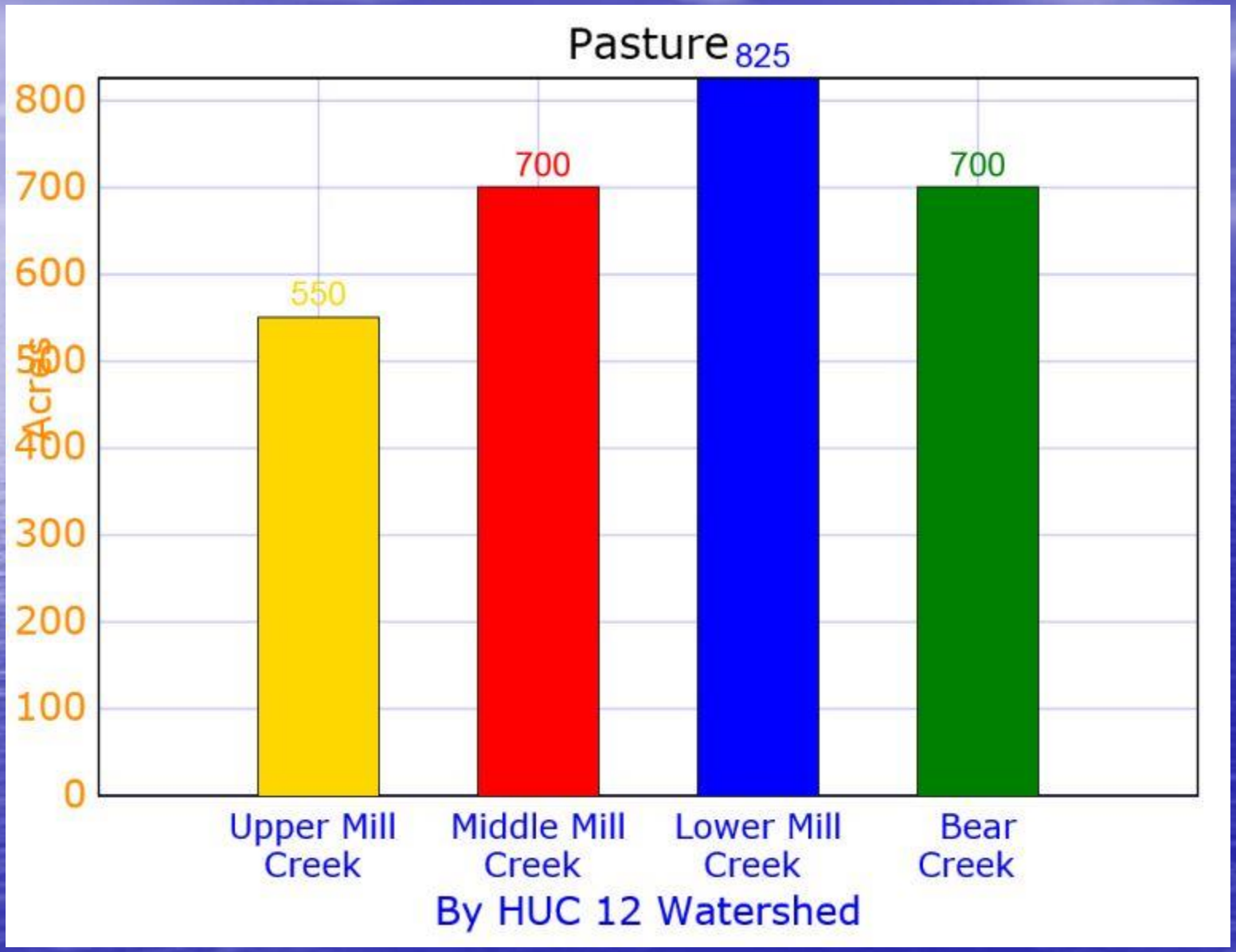


WISCONSIN DEPT. OF NATURAL RESOURCES

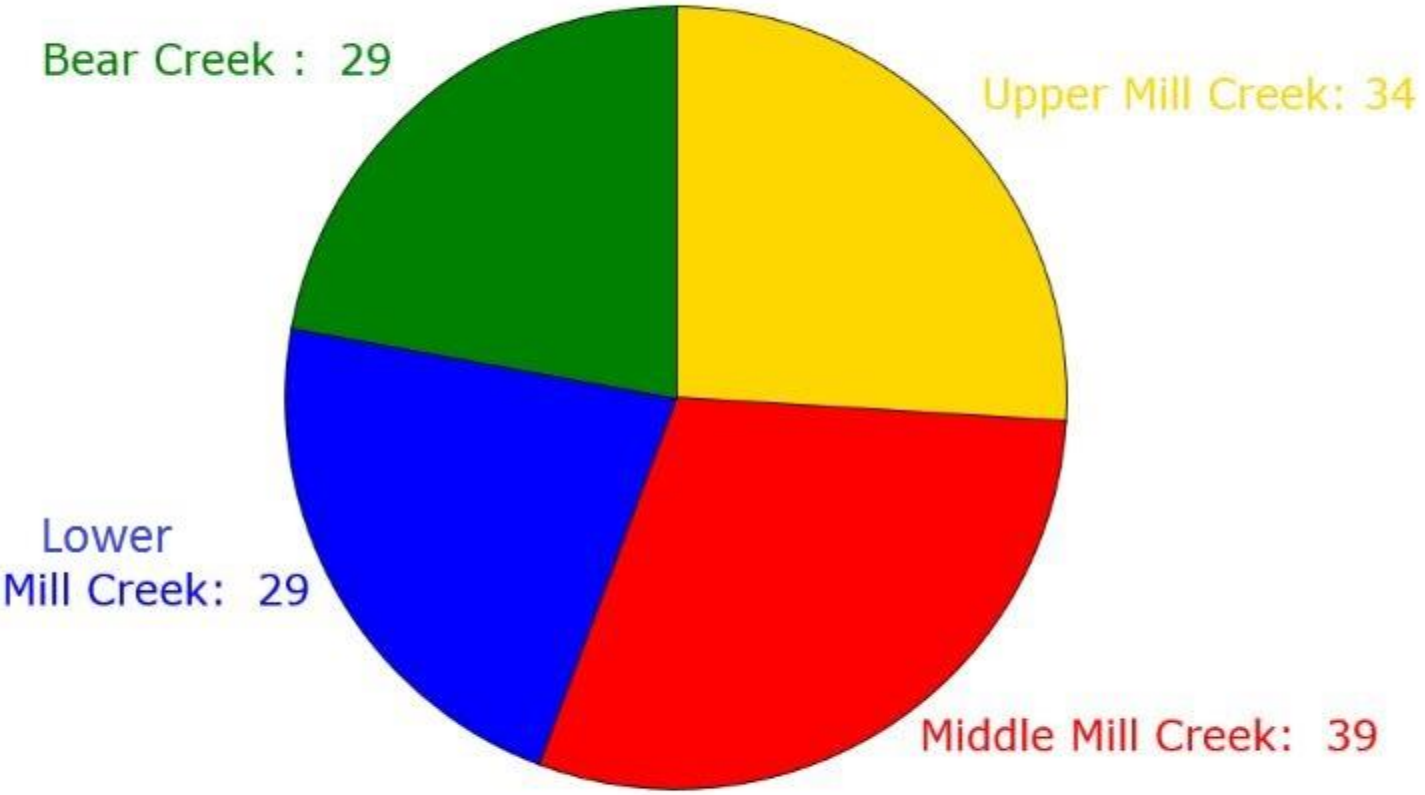

PORTAGE
Upper Mill Creek
070700030201
Middle Mill Creek
070700030202
Lower Mill Creek
070700030204
Bear Creek
070700030203
WOOD


Most Common Soil
Percent
35
30
25
20
15
10
5
0
34.2
18.3
13.2
27.4
Upper Mill Creek (WEB) 0-3% Slope
Middle Mill Creek (Mr) 0-3% Slope
Lower Mill Creek (MeA) 1-3% Slope
Bear Creek (DoA)1-3% Slope
By HUC 12 Watershed

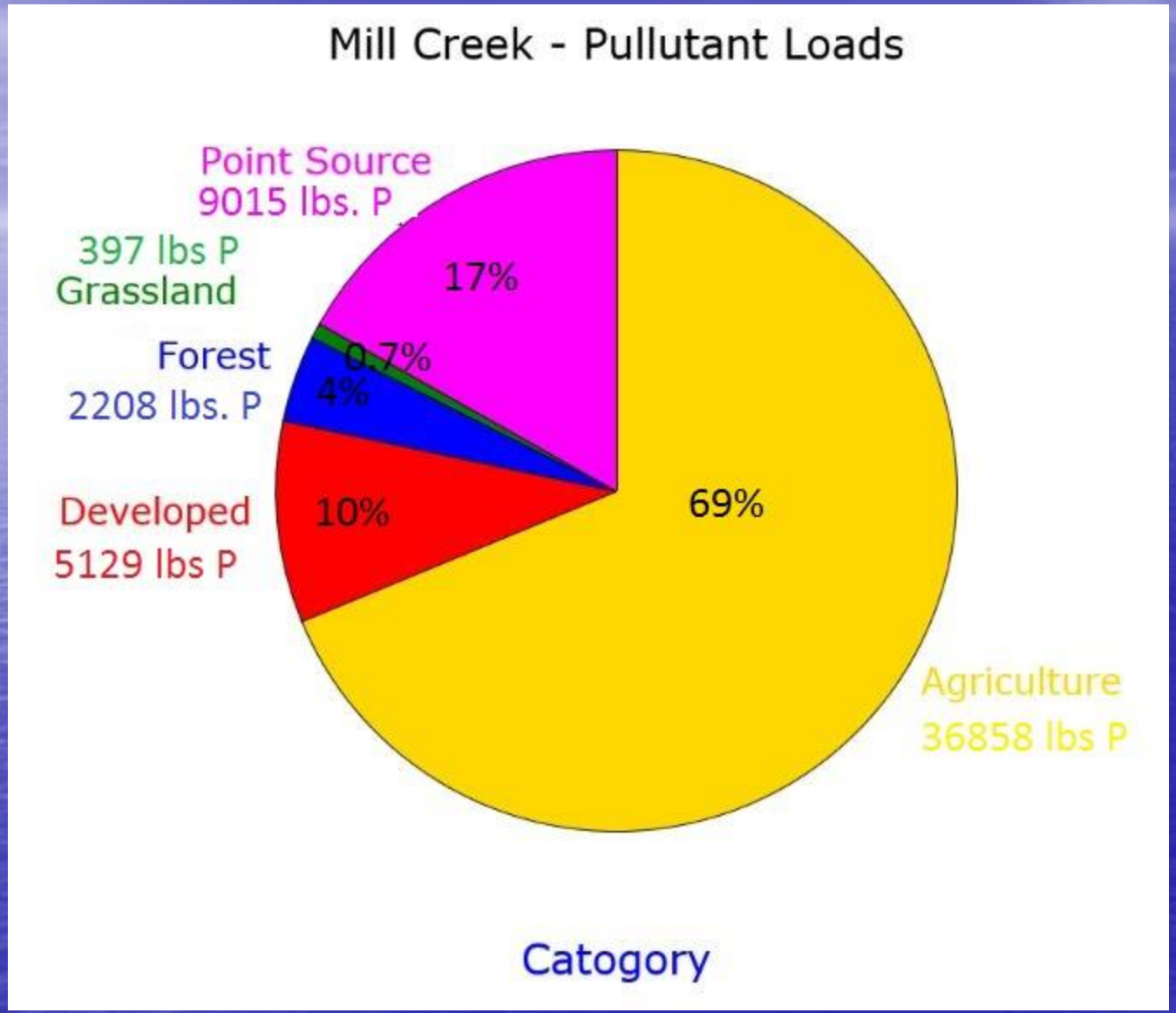

Soil Test P Average
35
30
25
20
15
10
5
0
ppm
32.1
34.5
35
36
Upper Mill Creek
Middle Mill Creek
Lower Mill Creek
Bear Creek
By HUC 12 Watershed


Pasture
825
800
700
600
500
400
300
200
100
0
700
700
550
Acres
Upper Mill Creek
Middle Mill Creek
Lower Mill Creek
Bear Creek
By HUC 12 Watershed

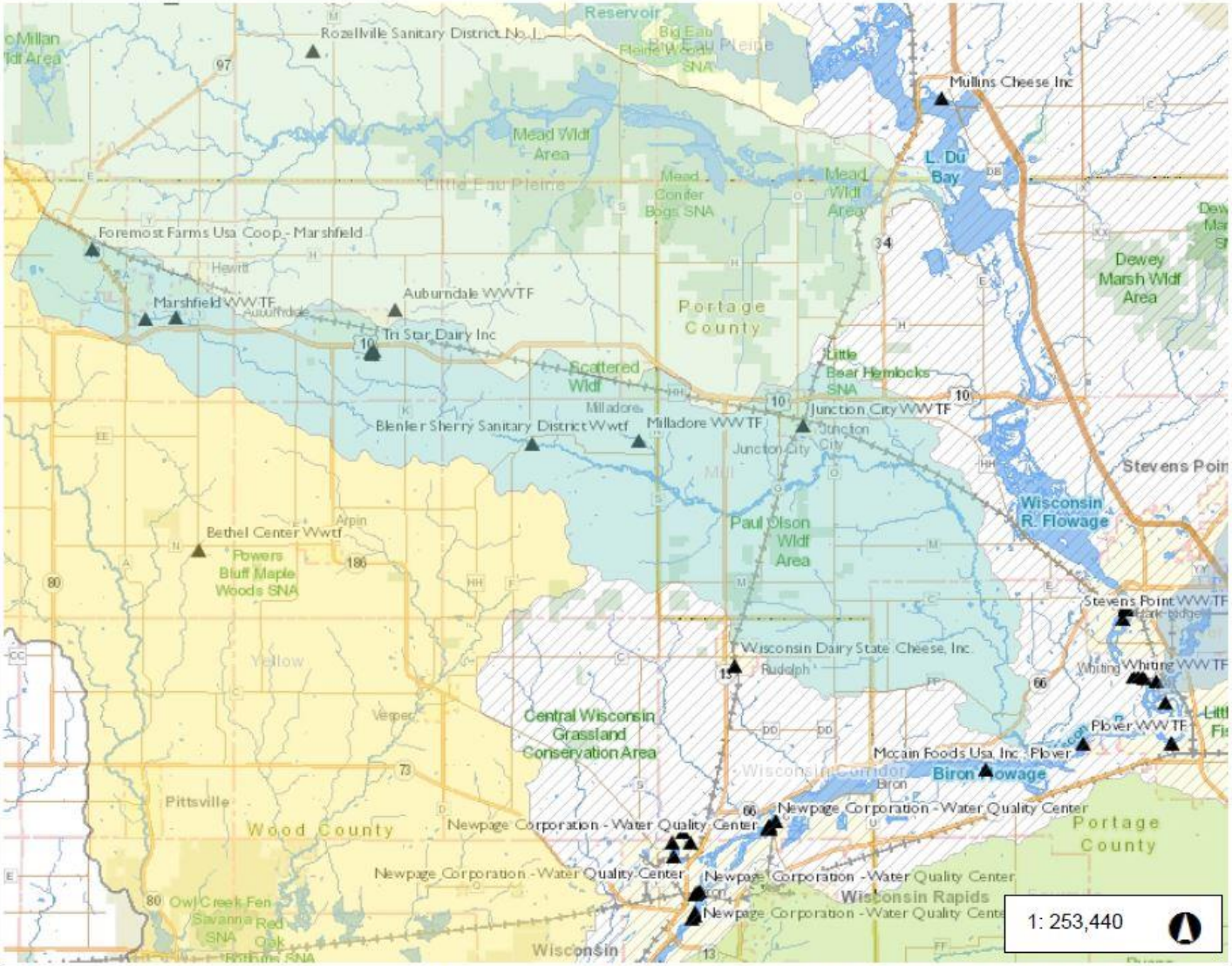
Feedlots/Barnyards



By HUC 12 Watershed


Mill Creek - Pullutant Loads
Point Source
9015 lbs. P
17%
397 lbs P
Grassland
0.7%
Forest
2208 lbs. P
4%
Developed
5129 lbs P
10%
69%
Agriculture
36858 lbs P
Catogory

Watershed Restoration Viewer Map



Legend

- Watershed Boundary

Major Tributary Drainages

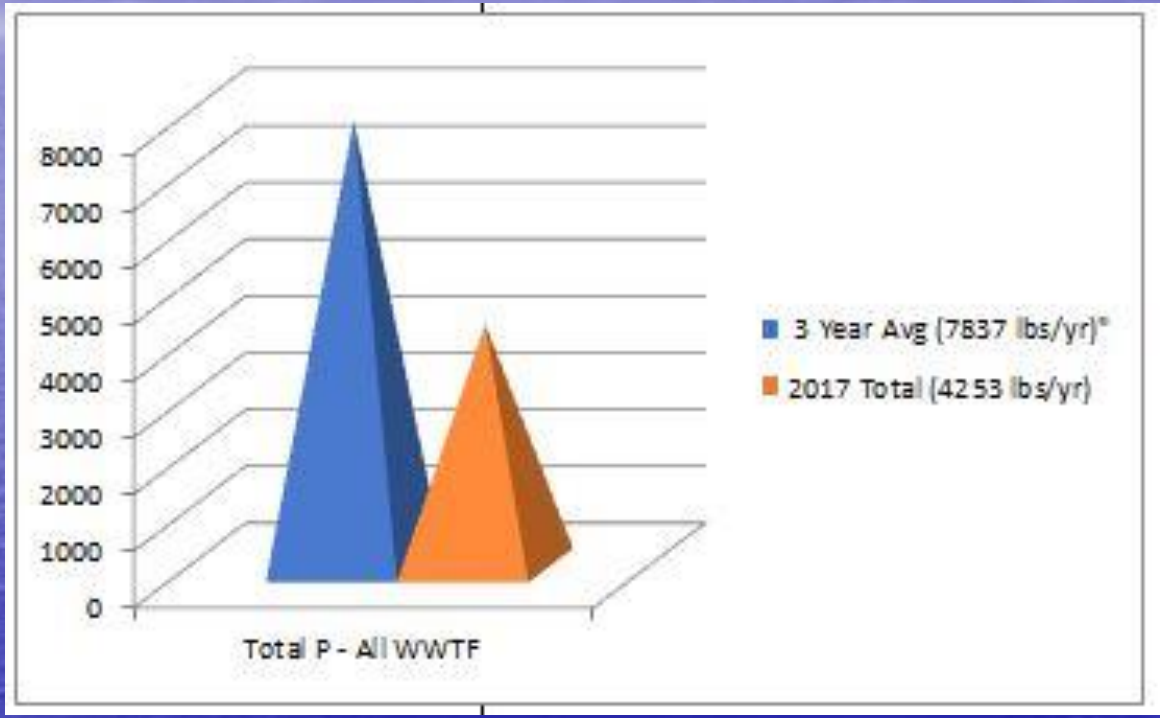
- Baraboo
- Big Eau Pleine
- Big Roche a Cri
- Copper
- Eagle
- Eau Claire
- Fourmile
- Fourteenmile
- Gillmore
- Lemonweir
- Little Eau Pleine
- Little Roche a Cri
- Mill
- New Wood
- Pelican
- Pine
- Plover
- Prairie
- Rib
- Somo
- Spirit
- Tenmile
- Tomahawk
- Trappe

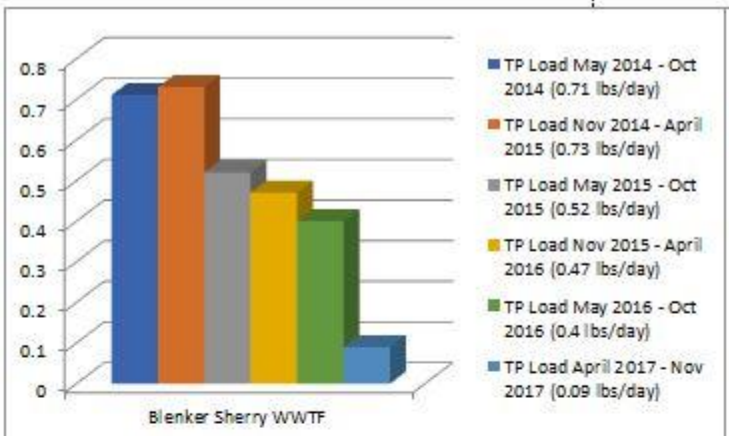
Notes

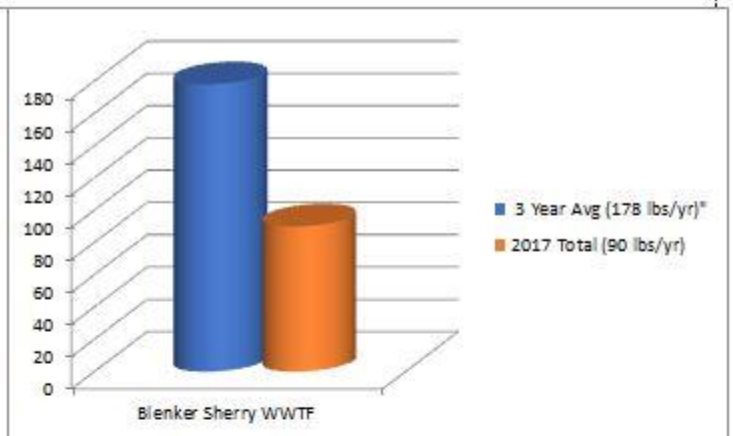
Mill Creek Point Source Discharge Permits

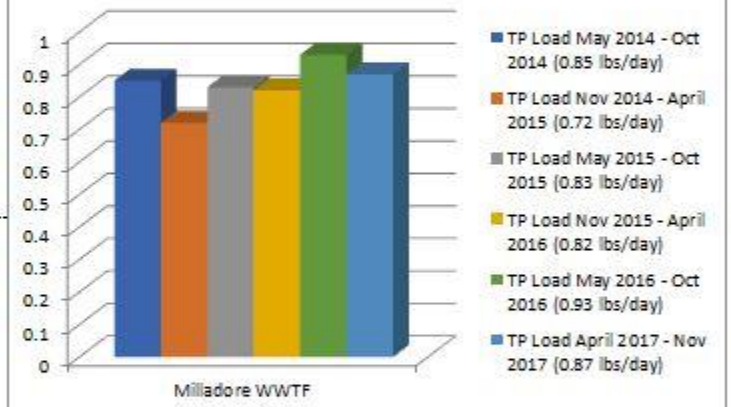
8.0 0 4.00 8.0 Miles

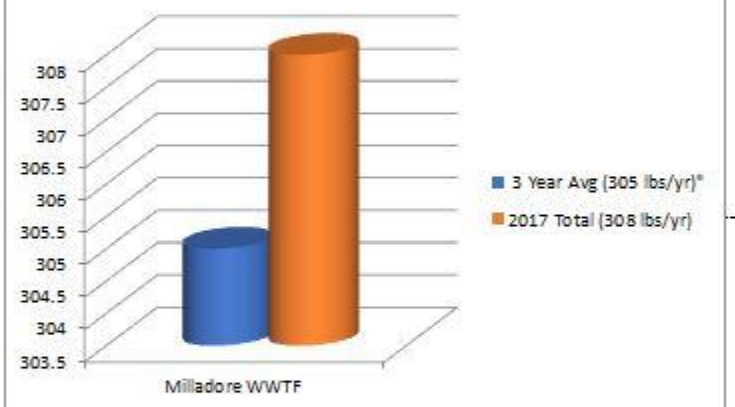
NAD_1983_HARN_Wisconsin_TM

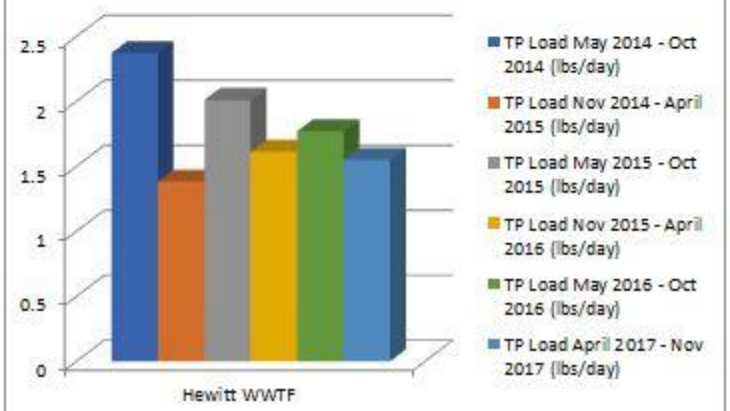

8000
7000
6000
5000
4000
3000
2000
1000
0
Total P - All WWTF
3 Year Avg (7837 lbs/yr)*
2017 Total (4253 lbs/yr)

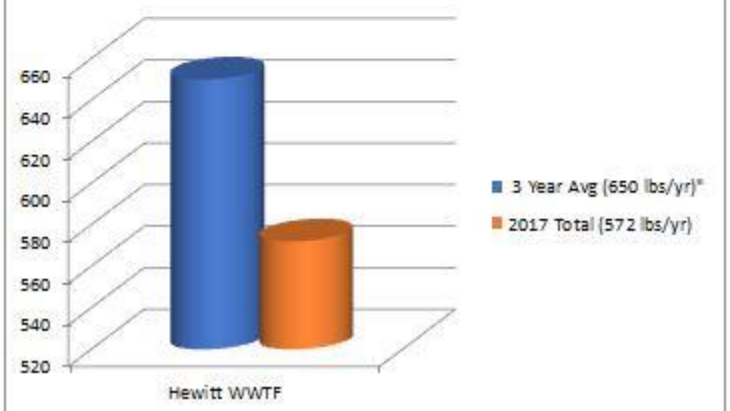

0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Blenker Sherry WWTF
TP Load May 2014 - Oct 2014 (0.71 lbs/day)
TP Load Nov 2014 - April 2015 (0.73 lbs/day)
TP Load May 2015 - Oct 2015 (0.52 lbs/day)
TP Load Nov 2015 - April 2016 (0.47 lbs/day)
TP Load May 2016 - Oct 2016 (0.4 lbs/day)
TP Load April 2017 - Nov 2017 (0.09 lbs/day)

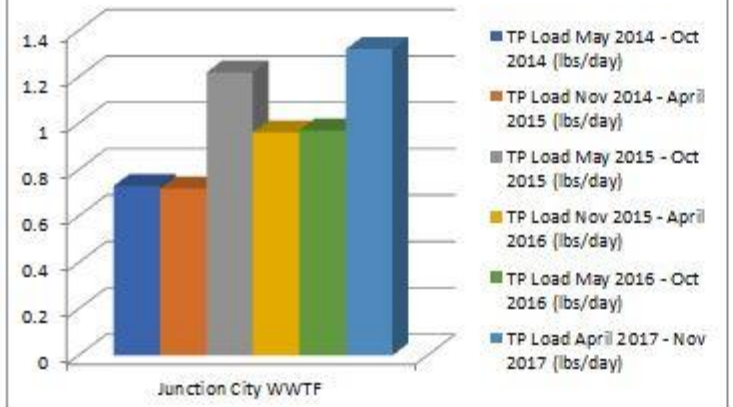

180
160
140
120
100
80
60
40
20
0
Blenker Sherry WWTF
3 Year Avg (178 lbs/yr)*
2017 Total (90 lbs/yr)


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Milladore WWTF
TP Load May 2014 - Oct 2014 (0.85 lbs/day)
TP Load Nov 2014 - April 2015 (0.72 lbs/day)
TP Load May 2015 - Oct 2015 (0.83 lbs/day)
TP Load Nov 2015 - April 2016 (0.82 lbs/day)
TP Load May 2016 - Oct 2016 (0.93 lbs/day)
TP Load April 2017 - Nov 2017 (0.87 lbs/day)

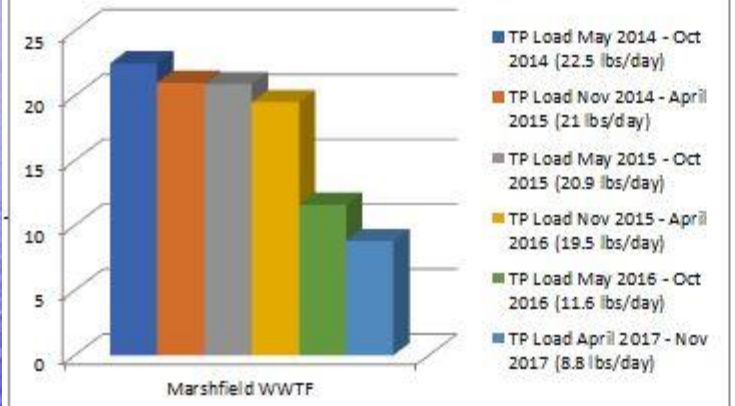

308
307.5
307
306.5
306
305.5
305
304.5
304
303.5
Milladore WWTF
3 Year Avg (305 lbs/yr)*
2017 Total (308 lbs/yr)

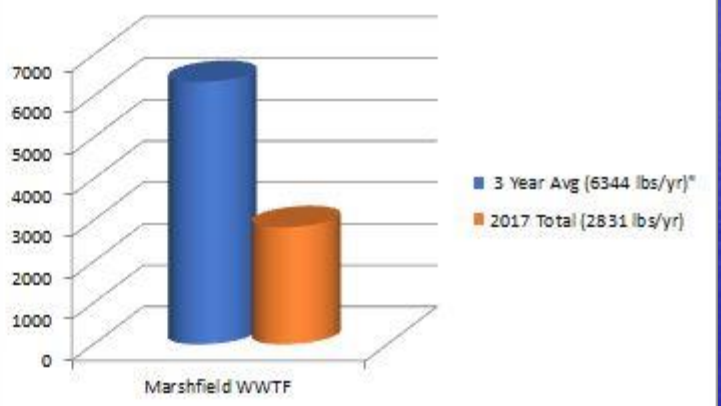

2.5
2
1.5
1
0.5
0
Hewitt WWTF
TP Load May 2014 - Oct 2014 (lbs/day)
TP Load Nov 2014 - April 2015 (lbs/day)
TP Load May 2015 - Oct 2015 (lbs/day)
TP Load Nov 2015 - April 2016 (lbs/day)
TP Load May 2016 - Oct 2016 (lbs/day)
TP Load April 2017 - Nov 2017 (lbs/day)

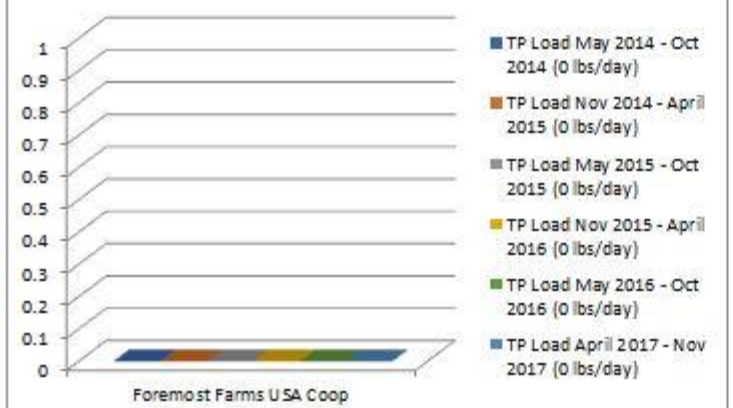

660
640
620
600
580
560
540
520
Hewitt WWTF
3 Year Avg (650 lbs/yr)*
2017 Total (572 lbs/yr)

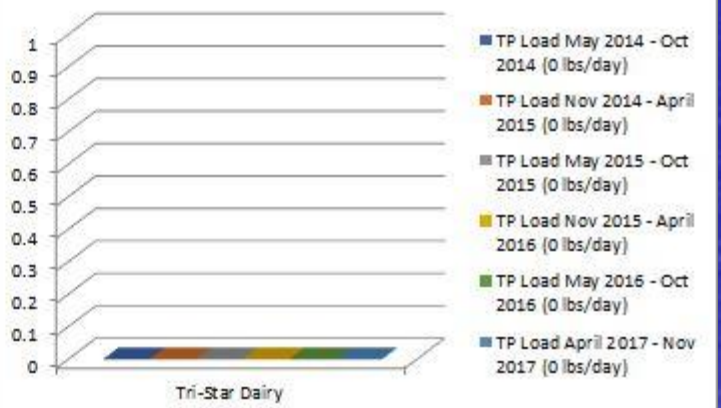

1.4
1.2
1
0.8
0.6
0.4
0.2
0
Junction City WWTF
TP Load May 2014 - Oct 2014 (lbs/day)
TP Load Nov 2014 - April 2015 (lbs/day)
TP Load May 2015 - Oct 2015 (lbs/day)
TP Load Nov 2015 - April 2016 (lbs/day)
TP Load May 2016 - Oct 2016 (lbs/day)
TP Load April 2017 - Nov 2017 (lbs/day)


500
450
400
350
300
250
200
150
100
50
0
Junction City WWTF
3 Year Avg (360 lbs/yr)*
2017 Total (452 lbs/yr)


25
20
15
10
5
0
Marshfield WWTF
TP Load May 2014 - Oct 2014 (22.5 lbs/day)
TP Load Nov 2014 - April 2015 (21 lbs/day)
TP Load May 2015 - Oct 2015 (20.9 lbs/day)
TP Load Nov 2015 - April 2016 (19.5 lbs/day)
TP Load May 2016 - Oct 2016 (11.6 lbs/day)
TP Load April 2017 - Nov 2017 (8.8 lbs/day)

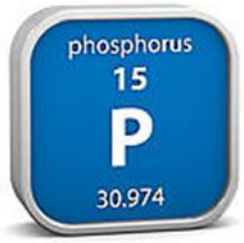

7000
6000
5000
4000
3000
2000
1000
0
Marshfield WWTF
3 Year Avg (6344 lbs/yr)*
2017 Total (2831 lbs/yr)


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Foremost Farms USA Coop
TP Load May 2014 - Oct 2014 (0 lbs/day)
TP Load Nov 2014 - April 2015 (0 lbs/day)
TP Load May 2015 - Oct 2015 (0 lbs/day)
TP Load Nov 2015 - April 2016 (0 lbs/day)
TP Load May 2016 - Oct 2016 (0 lbs/day)
TP Load April 2017 - Nov 2017 (0 lbs/day)


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Tri-Star Dairy
TP Load May 2014 - Oct 2014 (0 lbs/day)
TP Load Nov 2014 - April 2015 (0 lbs/day)
TP Load May 2015 - Oct 2015 (0 lbs/day)
TP Load Nov 2015 - April 2016 (0 lbs/day)
TP Load May 2016 - Oct 2016 (0 lbs/day)
TP Load April 2017 - Nov 2017 (0 lbs/day)

What does 7,600 lbs P look like?

using  as an example

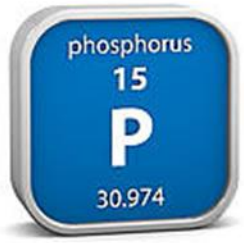


7,600 lbs

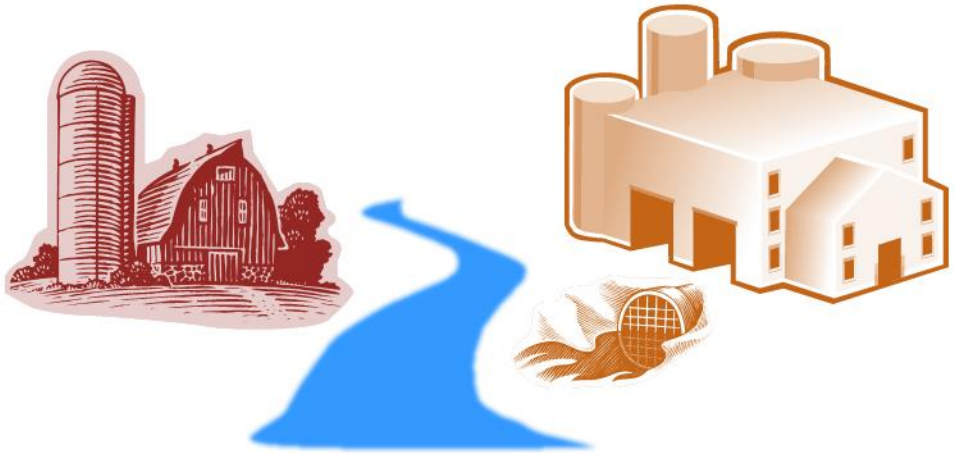
What does 7,600 lbs P look like?

using  as an example

....but keeping in mind that P comes from a variety of urban and agricultural sources

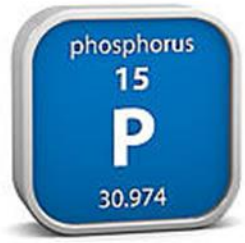


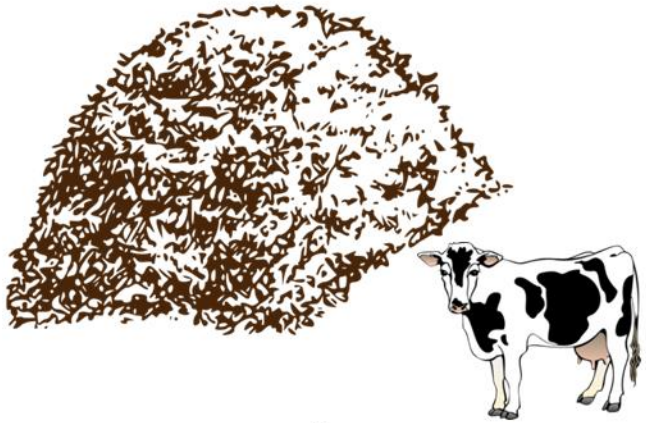
7,600 lbs



What does 7,600 lbs P look like?

using  as an example



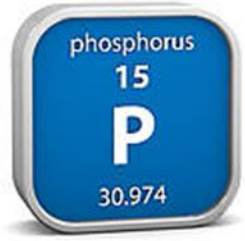


7,600 lbs

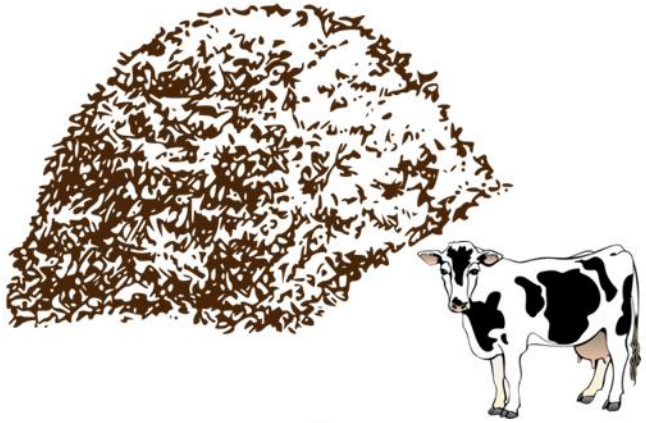
1,900 tons
(461,000 gallons)

What does 7,600 lbs P look like?

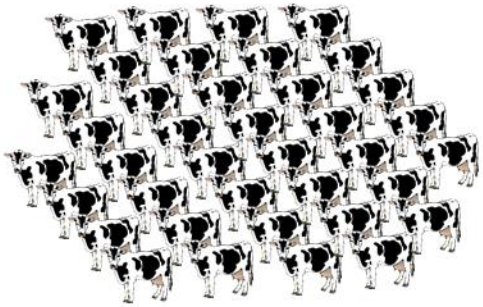
using  as an example



7,600 lbs



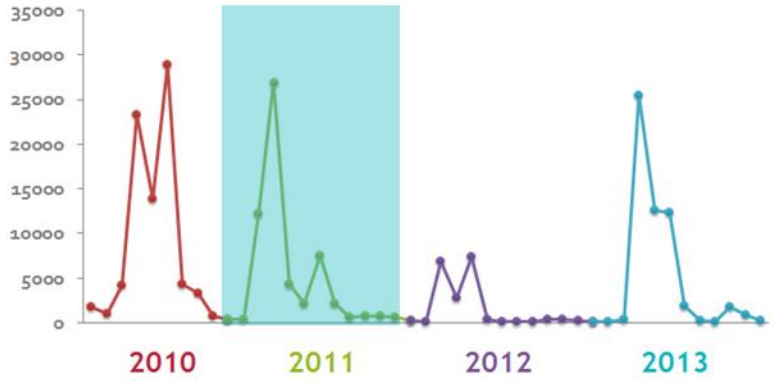
1,900 tons
(461,000 gallons)



80 cows

How much is that P worth?

Total 2011:



59,000 lbs

$40,000

Why does this matter?

2,400 tons sediment

- **880 tons** in 2010
- **210 tons** in 2012

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