

# 9 Key Element Watershed Plans

Where and What are they?

What methods/tools can help create a plan?

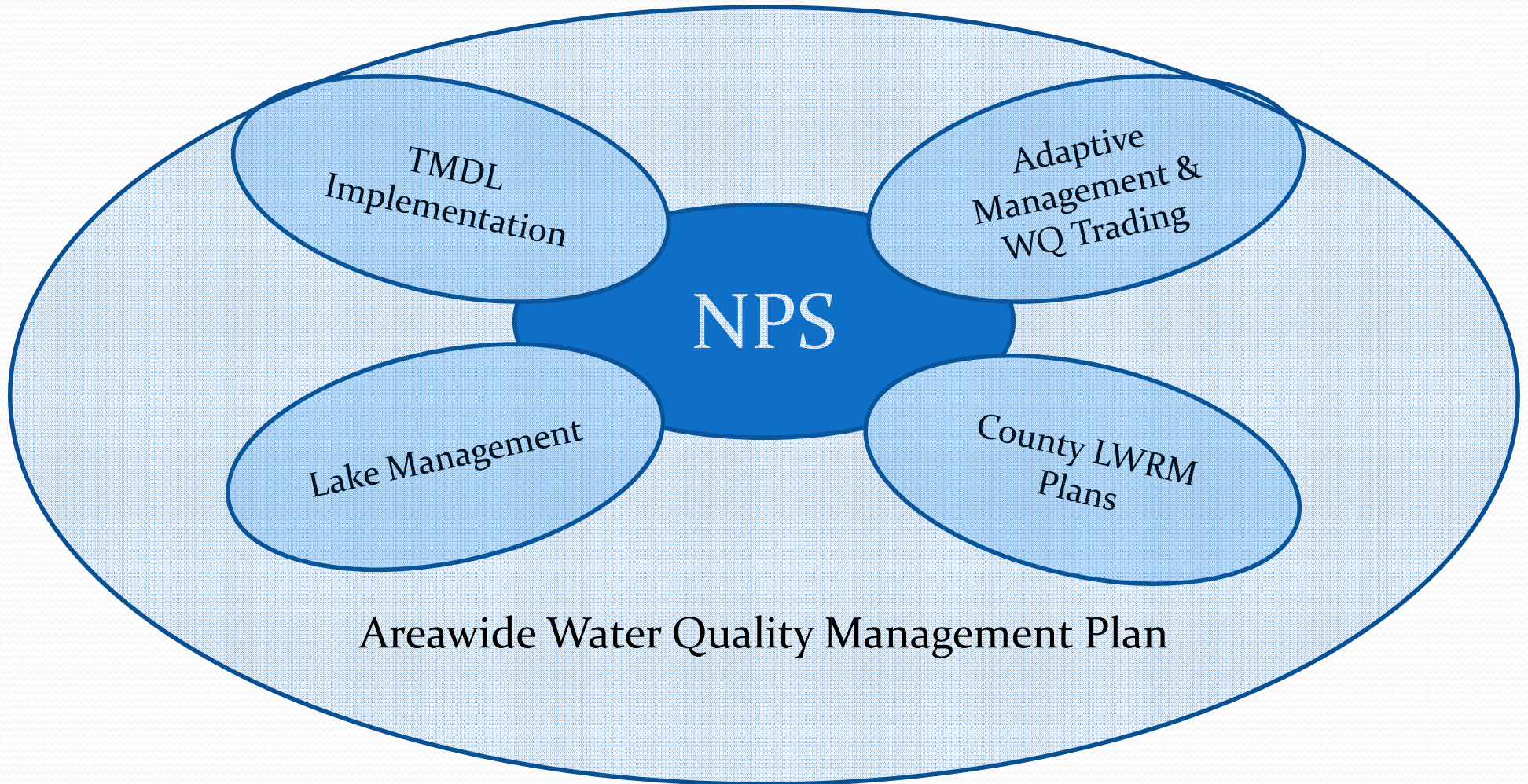
Relationship to other plans

Presented by: Andrew Craig  
DNR Nonpoint Source Planning Coordinator  
Wisconsin Lakes Conf - April 2017

**“Nonpoint source pollution continues to be the leading source of water quality impairments throughout the United States.”** Draft Sect. 319 Grant Guidelines – November 2012



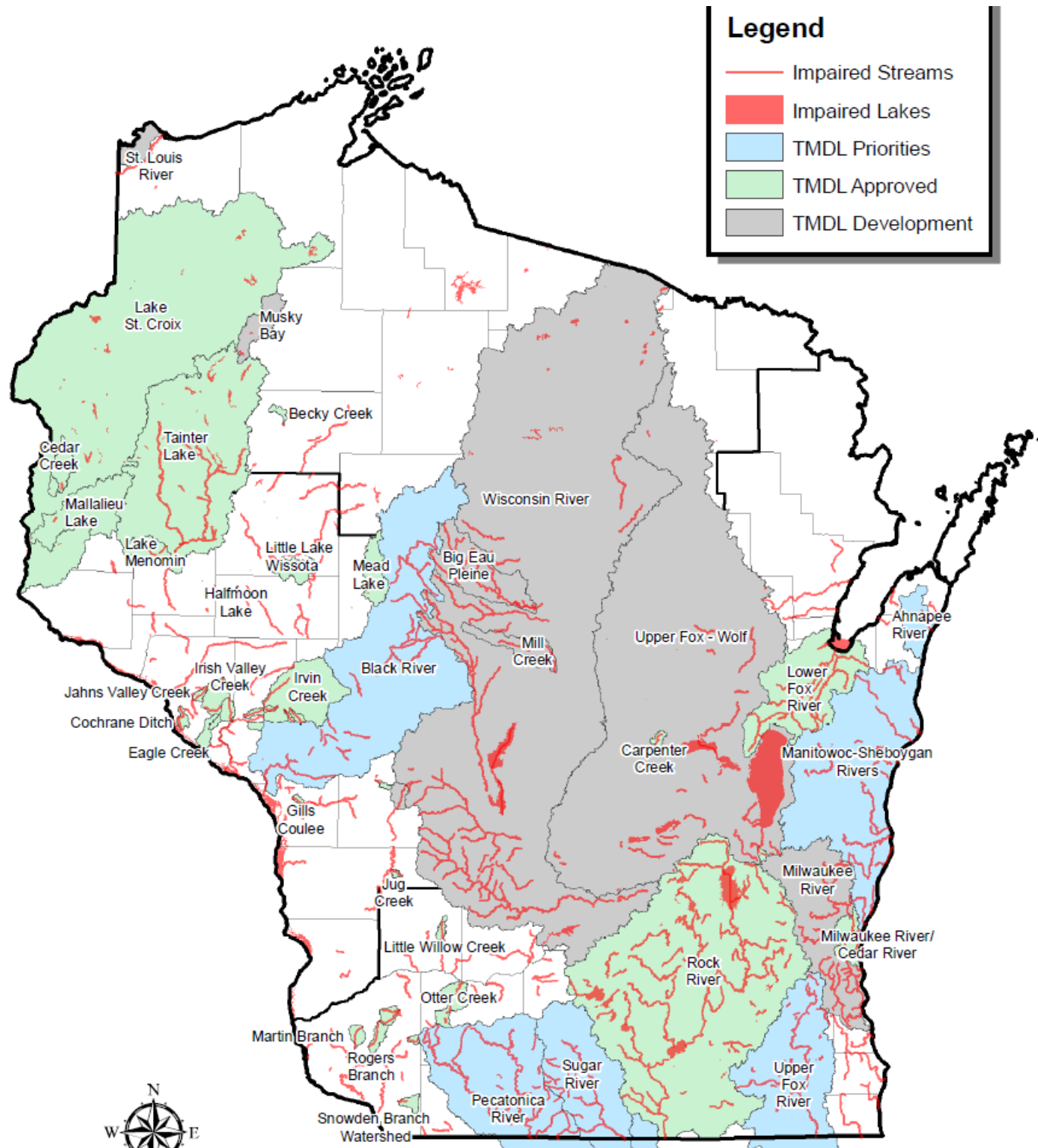
# Multiple Planning Efforts with Something in Common





# Wisconsin Impaired Waters + TMDLs 2016

Phosphorus  
Sediment  
Toxics  
Bacteria



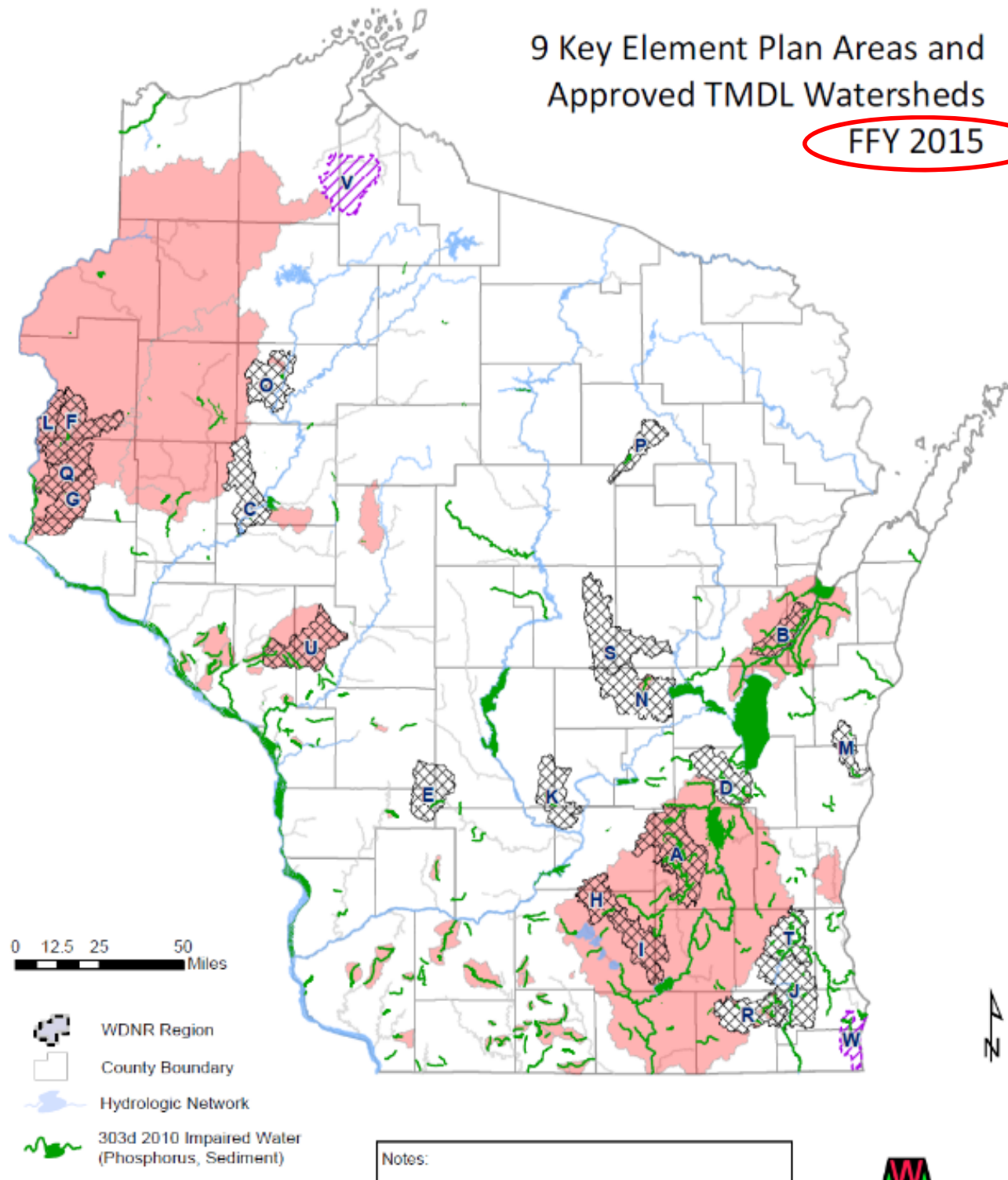
# 9 Element Plans + Approved TMDL Watersheds

Pink = Approved TMDL area

Cross-hatch = 9 Element Plan

Green = P or Sediment Impaired Water

Purple = Recently Approved 9 Element Plan





# 9 Element Plans

Green /Red = Recently Approved

Yellow = Expire in 2016-17

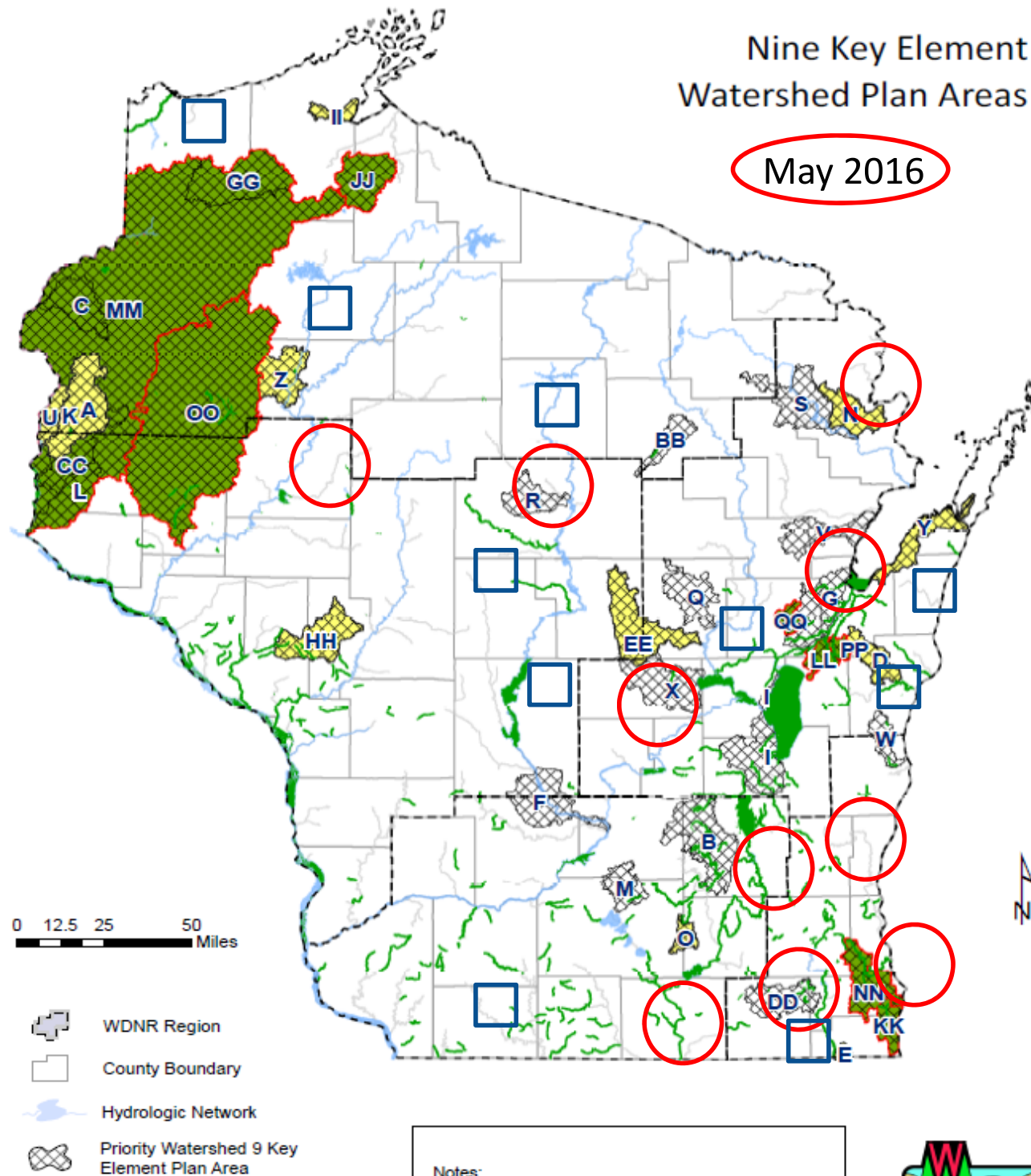
White = Expire in 2019

Circle = Plan under Development

Square = Interested in 9E Plan

## Nine Key Element Watershed Plan Areas

May 2016





# What are 9 Element Plans?



# What are 9 Element Plans?

- **Watershed based** (HUC 12 size – 35 square miles)
- **Goal: Restore impaired waters OR protect non-impaired waters**
- **Reduce nonpoint runoff so water meets standards and maintains uses**
  - (fishable, swimmable, drinkable) - mimic TMDL's
- **Framework to incorporate existing activities/plans within specific watersheds**



What are the 9 Elements?



# What are the 9 Elements?

- (1) **Identify the causes and sources of pollution in watershed** that need reduction to meet/maintain WQ standards
  - Select significant pollutant sources
  - Estimate number and location of sources and background levels
  - Use Maps and Tables
- (2) **Describe management measures that need to be implemented** to achieve load reductions
  - Identify/map priority area(s) for practices
- (3) **Estimate** the load reductions expected from selected management measures
  - Using models or other methods (e.g., literature, edge of field measurements)

# What are the 9 Elements?

(4) **Estimate** amounts of technical and financial asst, costs and authorities to implement the plan

- Long Term Operation and Maintenance of Practices
- Monitoring and Evaluation – check % of practices/acres
- NR 151, Ordinance

(5) **Information/education component** to encourage participation and plan implementation

(6) **Schedule** for implementing the management measure

- 5, 10, 15 or 20 years?
- Include plan milestones



# What are the 9 Elements?

(7) **Interim, measurable milestones** to assess if plan is being implemented

(8) **Set of criteria to determine whether plan objectives are or are not being achieved over time**

If little progress, how and when will plan be revised?

Recognize time needed to implement practices and lag time for WQ response

(9) **Monitoring component** to evaluate the effectiveness of the implementation efforts over time.

- Annual plan updates
- Integrate with plan schedule, milestones and element 8 criteria
- WQ monitoring in areas after significant implementation
- DNR priority for assessing watersheds with 9 Element plans



# Methods for creating 9 Element Plans



# Methods

## **(1) Watershed Location and Size are critical factors**

- **Prior /Existing activities, grant resources, programs**
- **Landowner interest and participation**
- **Larger watershed = more inventory, practices, resources, longer time for WQ response**
- **Smaller watershed = less inventory, practices, resources, shorter time for WQ response**

## **(2) Use the 9 Elements as an outline**

- **Determine what information you already have and what info you need**
- **Checklist approach**

# Methods

## **(3) Identify how existing plans, programs & information align with specific elements**

- **Land and Water Resource Management Plan objectives**
- **County Ordinances, NR 151 and Farmland Preservation**
- **Lake Management Plans**
- **Approved TMDL's – use to prioritize areas and set load reductions**
- **WQ and habitat monitoring – recent data collection?**
- **Existing Projects and Grants**
  - **State** - Lake Management Plans, NOD and TRM grants, Priority Wshed Projects
  - **Federal** - RCPP, NWQI, GLRI, MRBI watersheds, EQIP
  - **Non-Governmental** - Farmer Led Councils, Non-Profit Conservation projects (e.g., TNC, Land Trusts, Trout Unlimited)
  - **Tribal**
  - **Point Source Permits – WQ Trading Adapt Manage or MDV**



# Methods

## **(4) Consult with DNR Watershed\* and Water Quality Staff**

- **Region Nonpoint Source Coordinators\***

<http://dnr.wi.gov/topic/Nonpoint/NPScontacts.html>

- **Central Office Nonpoint Source Plan Coordinator \***

Andrew Craig

- **Water Quality Biologists**

[http://dnr.wi.gov/staffdir/\\_newsearch/contactsearchext.aspx?exptype=exact&exp=Water+Quality+Biologist](http://dnr.wi.gov/staffdir/_newsearch/contactsearchext.aspx?exptype=exact&exp=Water+Quality+Biologist)

- **WQ modelers**

[http://dnr.wi.gov/staffdir/\\_newsearch/contactsearchext.aspx?exptype=exact&exp=Water+Quality+Modeling](http://dnr.wi.gov/staffdir/_newsearch/contactsearchext.aspx?exptype=exact&exp=Water+Quality+Modeling)

# Methods

## **(5) Use ATCP 50.12 County LW plan content and development requirements**

- **When compared, 50.12 criteria is CONSISTENT with the 9 Elements – DNR fact sheet (next slide)**
- **LW Plan requirements align with the 9 Elements OR 9 elements are consistent with LW plan requirements**
- **DATCP LW Plan checklist contains 9 Key Element question**



# Methods

## (5) DNR County LW Plan and 9 Element FACT Sheet



### County Land and Water Resource Management Plans and the 9 Key Elements

Watershed scale planning to help focus efforts and increase funding opportunities

#### What are 9 Key Element Plans?

The EPA has identified nine key planning elements that are critical for protecting and improving water quality. Plans that reflect the nine key elements help assess the contributing causes and sources of nonpoint source pollution within a defined watershed area and then prioritize pollutant reduction strategies to restore or protect water quality. Nine key element watershed plans can be used to restore impaired waters or help protect unimpaired waters. In order to be eligible for Clean Water Act (CWA) Section 319 and Great Lakes Restoration Initiative (GLRI) funding from US EPA, the following nine elements must be addressed in a watershed plan:

- |  |  |
|--|--|
| <b>1</b> Identify the causes and sources that need to be controlled to achieve pollutant load reductions. This includes quantifying significant sources and background levels using maps and tables. | <b>5</b> Develop an information & education component to encourage participation and Plan implementation.  |
| <b>2</b> Estimate the pollutant load reductions expected from selected management measures.  | <b>6</b> Develop a schedule for implementing the management measures identified in the Plan.   |
| <b>3</b> Describe management measures that need to be implemented to achieve load reductions. Map priority areas for implementing practices.   | <b>7</b> Describe interim, measurable milestones to assess if the Plan is being implemented.   |
| <b>4</b> Estimate amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement the Plan.                        | <b>8</b> Identify a set of criteria to determine whether Plan objectives are or are not being achieved over time. Outline how and when the Plan will be revised if progress is not being made. |
|  | <b>9</b> Develop a monitoring component to evaluate the effectiveness of the implementation efforts over time using criteria from elements 6, 7 and 8.   |

Many LWRM Plan requirements are consistent with the nine key elements.  
See Page 4 for a comparison of LWRM Plan components to the nine key elements.

#### Comparing the 9 key elements to s. ATCP 50.12 requirements

Key element #	ATCP 50 LWRM Plan Content Requirements (abridged)
	A Land and Water Resource Management Plan shall describe all of the following in reasonable detail:
<b>1</b>	(a) Water quality and soil erosion conditions throughout the county, including identification of the causes of water quality impairment and pollutant sources. The Plan shall include water quality assessments for each watershed in the county available from DNR, if any.
<b>4</b>	(b) State and local regulations that the county will use to implement the county Plan. DATCP may require the county to provide copies of relevant local regulations, as necessary, and may comment on those regulations.
<b>2</b>	(c) Water quality objectives for each watershed, including any available pollutant load reduction targets, consistent with conditions identified in par. (a). The county shall consult with DNR to determine water quality objectives and to identify pollutant load reduction targets.
<b>1&amp;3</b>	(d) Key water quality and soil erosion problem areas. The county Land Conservation Committee shall identify key water quality problem areas in consultation with DNR.
<b>2&amp;3</b>	(e) Conservation practices needed to address key water quality and soil erosion problems.
<b>1&amp;3</b>	(f) A strategy to identify priority farms in the county.
<b>4</b>	(g) County strategies to encourage voluntary implementation of conservation practices under s. ATCP 50.04. A county shall estimate the amount of information and education, cost-sharing and other financial assistance, and technical assistance needed to implement its Plan.
	(h) Compliance procedures, including notice, hearing, enforcement, and appeal procedures, that will apply if the county takes action against a landowner for failure to implement conservation practices required under ch. ATCP 50, ch. NR 151 or related local regulations.
<b>4&amp;6</b>	(i) The county's multi-year workplan to implement the farm conservation practices under s. ATCP 50.04, and achieve compliance with performance standards under ch. NR 151. The Plan shall identify priorities, benchmarks for performance, and expected costs, including an estimate of costs to implement conservation practices to achieve the objectives identified in par. (c).
<b>7,8,9</b>	(j) The measurable annual and multi-year benchmarks the county will utilize to periodically monitor and measure its progress in meeting performance targets and achieving plan goals and objectives under the workplan in par. (i).
<b>5</b>	(k) How the county will provide information and education related to land and water conservation, including information related to farm conservation practices and cost-share funding.
<b>1-9</b>	(l) How the county will coordinate its land and water conservation program with federal, state, and local agencies.

# ATCP 50.12 - Content

(2) **PLAN CONTENTS.** A land and water resource management plan shall describe all of the following in reasonable detail:

(a) Water quality and soil erosion conditions throughout the county, including identification of the causes of water quality impairment and pollutant sources. The plan shall include water quality assessments for each watershed in the county available from DNR if any.

(b) State and local regulations that the county will use to implement the county plan. The department may require the county to provide copies of relevant local regulations, as necessary, and may comment on those regulations.

Note: See state rules under chs. ATCP 48, ATCP 50, NR 151, and NR 243.

(c) Water quality objectives for each watershed, including any available pollutant load reduction targets, consistent with conditions identified in par. (a). The county shall consult with DNR to determine water quality objectives and to identify pollutant load reduction targets.

(d) Key water quality and soil erosion problem areas. The county land conservation committee shall identify key water quality problem areas in consultation with DNR.

(e) Conservation practices needed to address key water quality and soil erosion problems.

(f) A plan to identify priority farms in the county.

Note: The identification of priority farms may vary between counties, depending on local conditions, strategies, and information. A county should focus on identifying or working with the following farms, or other categories of farms that the county identifies in its plan:

- Farms subject to a DNR notice of intent under s. 281.20, Stats., or notice of discharge under ch. 283, Stats.
- Farms located in watersheds draining to waters that DNR has listed pursuant to

Element 1

Element 4

Element 2 & 3

Element 1, 3, 6

Element 3

Element 1 & 3



# ATCP 50.12 Content

Element 4

(g) County strategies to encourage voluntary implementation of conservation practices under s. [ATCP 50.04](#). A county shall estimate the amount of information and education, cost-sharing and other financial assistance, and technical assistance needed to implement its plan.

Element 4

(h) Compliance procedures, including notice, hearing, enforcement, and appeal procedures, that will apply if the county takes action against a landowner for failure to implement conservation practices required under this chapter, ch. NR 151 or related local regulations.

Note: See ss. [ATCP 50.04](#) to [50.08](#) and subch. VII.

Element 4, 6, 7

(i) The county's multi-year workplan to implement the farm conservation practices under s. ATCP 50.04, and achieve compliance with performance standards under ch. NR 151. The plan shall identify priorities, benchmarks for performance, and expected costs, including an estimate of costs to implement conservation practices to achieve the objectives identified in par. (c).

Note: The county workplan under par. (i) should be based on a reasonable assessment of available funding and resources.

Element 7, 8, 9

(j) The measurable annual and multi-year benchmarks the county will utilize to periodically monitor and measure its progress in meeting performance targets and achieving plan goals and objectives under the workplan in par. (i).

(jm) How a county will meet its responsibilities for monitoring conservation compliance of landowners claiming farmland preservation tax credits.

Element 5

(k) How the county will provide information and education related to land and water conservation, including information related to farm conservation practices and cost-share funding.

Element 1-9

(L) How the county will coordinate its land and water conservation program with federal, state, and local agencies.

# ATCP 50.12 - Development

**(3) PLAN DEVELOPMENT.** A county land conservation committee, when preparing a land and water resource management plan, shall do all of the following:

(a) Appoint and consult with a local advisory committee of interested persons.

**Note:** A local advisory committee should reflect a broad spectrum of public interests and perspectives. For example, it could include:

- Affected farmers, businesses, and landowners.
- Agricultural, business, environmental, civic, and recreational organizations.
- Federal, state, local, and tribal officials.
- The University of Wisconsin and other educational institutions.

(b) Assemble relevant data, including relevant land use, natural resource, water quality, and soil data.

(c) Consult with DNR.

**Note:** The county land conservation committee should normally consult with the appropriate DNR staff to obtain needed planning information, effectively address resource management concerns, and ensure that its plan incorporates elements that satisfy planning requirements under section 319 of the Clean Water Act.

(d) Assess resource conditions and identify problem areas.

(e) Establish and document priorities and objectives.

(f) Project available funding and resources.

(g) Establish and document a plan of action.

(h) Identify roles and responsibilities.

Element 1-9

Element 1-9



# County LW plans

## Two options to address the 9 Key Elements:

- **Develop a separate 9 Key Element plan**
  - Use existing information from LW plan, TMDL, WQ data  
AND
  - Reference the 9 element plan in LW plan
- **Revise LW plan to reflect the 9 Key Elements**
  - **For specific watersheds, not county wide**

# Methods

## **(6) Use NLC database, land use inventory, aerial photos to estimate number and location of pollutant sources in watershed**

- X acres of Cropland, Pasture, Forest, Wetland and Urban areas
- Y number of Dairy operations /acreage of feedlots with discharge to surface waters
- Z number/feet of eroding gullies or streambanks
  - Use EVAAL tool and Surveys to estimate number and location
- **Maps showing** source locations
  - Rely upon Aerial photos, EVAAL, Transects and Surveys



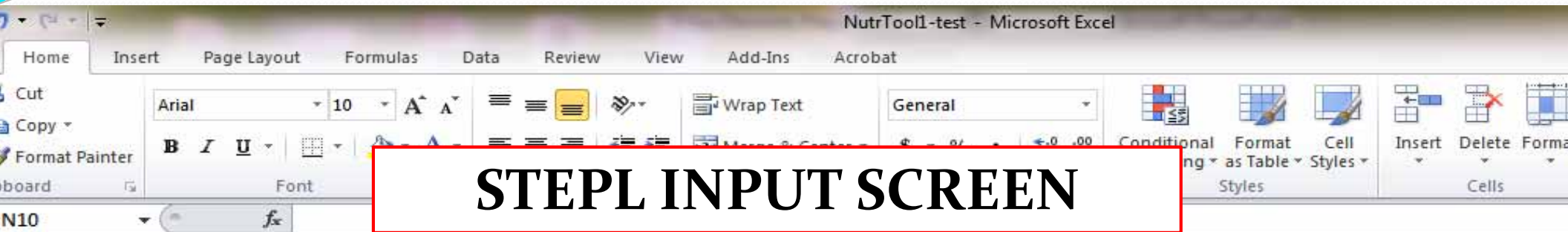
# Methods

## **(7) Use STEPL model to quantify watershed pollutant loads**

- **Excel Spreadsheet – created by EPA**
- **Define watershed conditions**
  - acres of cropland, forest, pasture, feedlots shorelines, wetlands, urban areas
  - representative soil information, tillage intensity, manure spreading
  - existing practices
- **Complete Before and After Analysis**
- **Quantify pollutant reductions from selected practices**
  - NMP's, Cover Crops, Filter Strips, Reduced Tillage
  - Grassed Waterways – reduce re-occurring gullies
  - Shoreline + Streambank restoration

# Methods

## STEPL INPUT SCREEN



1. Input watershed land use area (ac) and precipitation (in)										Rain correction factors		
Watershed	Urban	Cropland	Pastureland	Forest	User Defined	Feedlots	Feedlot Percent Paved	Total	Annual Rainfall	Rain Days	Avg. Rain/E	
W1	1500	25000	2200	1500	750	12	0-24%	30962	28.25	101.2		
W2	0	0	0	0	0	0	0-24%	0	28.25	101.2		
W3	0	0	0	0	0	0	0-24%	0	28.25	101.2		
W4	0	0	0	0	0	0	0-24%	0	28.25	101.2		

### 2. Input agricultural animals

Watershed	Beef Cattle	Dairy Cattle	Swine (Hog)	Sheep	Horse	Chicken	Turkey	Duck	# of months manure applied
W1	550	2800	0	0	100	1500	0	0	6
W2	0	0	0	0	0	0	0	0	0
W3	0	0	0	0	0	0	0	0	0
W4	0	0	0	0	0	0	0	0	0
Total	550	2800	0	0	100	1500	0	0	

### 3. Input septic system and illegal direct wastewater discharge data

Watershed	No. of Septic Systems	Population per Septic System	Septic Failure Rate, %	Wastewater Direct Discharge, # of People	Direct Discharge Reduction, %
W1	0	2.43	2	0	0
W2	0	2.43	2	0	0



# Methods

## STEPL INPUT SCREEN

### 1. BMPs and efficiencies for different pollutants on CROPLAND, ND=No Data

Watershed	Cropland					
	N	P	BOD	Sediment	BMPs	% Area BMP Applied
W1	0.275	0.225	ND	0.375	<input type="text" value="Reduced Tillage Systems"/>	50

### STEPL BMP list - adjust efficiency or add BMPs - using SNAP+ or research

Landuse	BMP & Efficiency	N	P	BOD	Sediment
Cropland					
Cropland	0 No BMP	0	0	0	0
Cropland	Combined BMPs-Calculated	0	0	0	0
Cropland	Contour Farming	0.485	0.55	ND	0.405
Cropland	Cover Crops	0.43	0.42	0	0.15
Cropland	Diversion	0.1	0.3	ND	0.35
Cropland	Filter strip	0.7	0.75	ND	0.65
Cropland	NMP - N and P bal	0.19	0.28	0	0
Cropland	Reduced Tillage Systems	0.55	0.45	ND	0.75
Cropland	Streambank stabilization and fencing	0.75	0.75	ND	0.75
Cropland	Terrace	0.2	0.7	ND	0.85

# Methods

## STEPL OUTPUT SCREEN

### 1. Total load by subwatershed(s)

Watershed	N Load (no BMP)	P Load (no BMP)	BOD Load (no BMP)	Sediment Load (no BMP)
	lb/year	lb/year	lb/year	t/year
W1	207929.9	58821.8	366543.9	7079.2
	N Load (with BMP)	P Load (with BMP)	BOD (with BMP)	Sediment Load (with BMP)
	lb/year	lb/year	lb/year	t/year
	158469.2	44347.7	350317.7	4543.9
	N Reduction	P Reduction	BOD Reduction	Sediment Reduction
	lb/year	lb/year	lb/year	t/year
	49460.7	14474.1	16226.1	2535.3
	%	%	%	%
	23.8	24.6	4.4	35.8

**BEFORE**

**AFTER**



# Methods

## (8) Use EPA Technical Memo – BMP Depreciation

[http://www.epa.gov/sites/production/files/201510/documents/tech\\_memo\\_1\\_oct15.pdf](http://www.epa.gov/sites/production/files/201510/documents/tech_memo_1_oct15.pdf)



### Technical Memorandum #1

## Adjusting for Depreciation of Land Treatment When Planning Watershed Projects

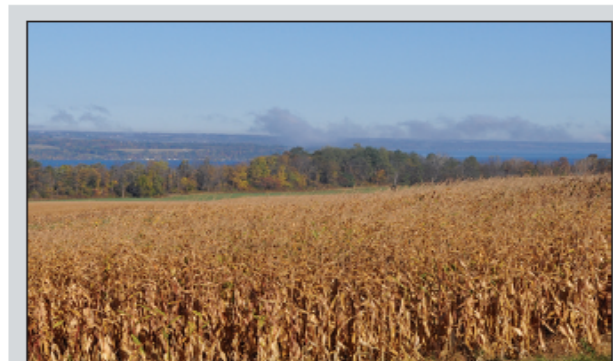
### Introduction

Watershed-based planning helps address water quality problems in a holistic manner by fully assessing the potential contributing causes and sources of pollution, then prioritizing restoration and protection strategies to address the problems (USEPA 2013). The U.S. Environmental Protection Agency (EPA) requires that watershed projects funded directly under section 319 of the Clean Water Act implement a watershed-based plan (WBP) addressing the nine key elements identified in EPA's [Handbook for Developing Watershed Plans to Restore and Protect](#)

This Technical Memorandum is one of a series of publications designed to assist watershed projects, particularly those addressing nonpoint sources of pollution. Many of the lessons learned from the Clean Water Act Section 319 National Nonpoint Source Monitoring Program are incorporated in these publications.

October 2015

Donald W. Meals and Steven A. Dressing. 2015. Technical Memorandum #1: Adjusting for Depreciation of Land Treatment When Planning Watershed Projects, October 2015. Developed for U.S. Environmental Protection Agency by Tetra Tech, Inc., Fairfax, VA, 16 p. Available online at [www.epa.gov/xxx/tech\\_memos.htm](http://www.epa.gov/xxx/tech_memos.htm).



# Methods

## **(9) Use other tools and resources to help prioritize areas for watershed plans**

- **SNAP+ Software** - use with STEPL or without
  - Select fields that reflect common crop rotations, soils, tillage
  - Determine how much cropland practices reduce pollutant loads
- **EVAAL tool** - DNR
- **Presto-Lite** - DNR
- **Wisconsin Lake and Watershed Spreadsheet** - DNR
- **Healthy Watersheds Assessment** - DNR
- **Citizens Guide to understanding Watershed Planning** - UWEX
- **UWEX Natural Resource Educator Staff**
- **AM and WQ Trading projects** - Point Source/DNR/County, 3<sup>rd</sup> party



# SnapPlus

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## ▶ Main Uses

- Determining Phosphorus Index for individual fields
- Testing impacts of management practices on P-Index and soil loss
- Estimating P and sediment load reductions due to management change

## ▶ Limitations / Cautions

- Assumes gully erosion is addressed
- Assumes field is uniform **Dominant critical soil**
- Uses simplified delivery to stream

**SnapPlus does not account for drain tiles**



# Methods

## **Use SnapPlus to define a watershed's . . .**

- **Baseline Condition – P and Sediment Loss**
- **Pollutant Loads after adoption of Cropland Practices**
- **Pollutant Reduction Efficiencies**
  - specific soils, crop rotations, tillage, nutrients application timing, methods and amounts

**Wisconsin soils + management factors are better defined in SnapPlus versus STEPL model**



# Area Weighted SnapPlus Watershed

**Example: TMDL Watershed has 58% TP reduction goal;**

**Cropland acres = 80% dairy rotation and 20% cash grain rotation**

- **SnapPlus shows baseline dairy rotation in watershed has annual P loss of 5 lb/ac and cash grain rotation has 3 lb/ac P loss**
- **The Area Weighted Baseline P loss for the watershed is 4.6 lb/acre**
  - Dairy =  $5.0 \text{ lb P/ac} \times 0.80 = 4.0 \text{ lb/ac}$
  - Cash Grain =  $3.0 \text{ lb P/ac} \times 0.20 = 0.6 \text{ lb/ac}$

# Area Weighted SnapPlus Watershed

**Example: TMDL Watershed has 58% TP reduction goal;**

**Cropland acres = 80% dairy rotation and 20% cash grain rotation**

- **SnapPlus shows new dairy practices (reduced tillage, filter strips, cover crops after corn silage) can reduce P loss from 5 to 1.2 lb/ac/year**
- **If 50% of dairy acres adopt new practices, the area weighted annual P loss = 3.1 lb/ac**
  - Dairy = 5.0 lb P/ac x 0.40 = 2.0 lb/ac
  - **New Dairy = 1.2 lb P/ac x 0.40 = 0.5 lb/ac**
  - Cash Grain = 3.0 lb P/ac x 0.20 = 0.6 lb/ac
- **4.6 lbs/ac – 3.1 lbs/ac = 1.5 lbs/ac = 33% P reduction from baseline.**  
**More than half way to meet TMDL goal!!**



# 9 Element Plans using STEPL or SNAP+

## **Snap+**

- Red Cedar
- Fenwood Creek

## **STEPL**

- Plum Kankapot, Upper East River, Upper Duck, Apple Creek
- Eau Claire River
- Lower Peshtigo River
- Jackson Creek

# EVAAL

- **Determines areas where sheet, rill and gully erosion is likely to occur in a watershed**
- **Estimates watershed historical practices and land use**
  - Number of cropland, forest, wetland and urban acres
  - Specific crop rotations (dairy, corn for grain, vegetable)
- **Can be used alone or in tandem with STEPL or SNAP+ to develop 9 Element watershed plans**

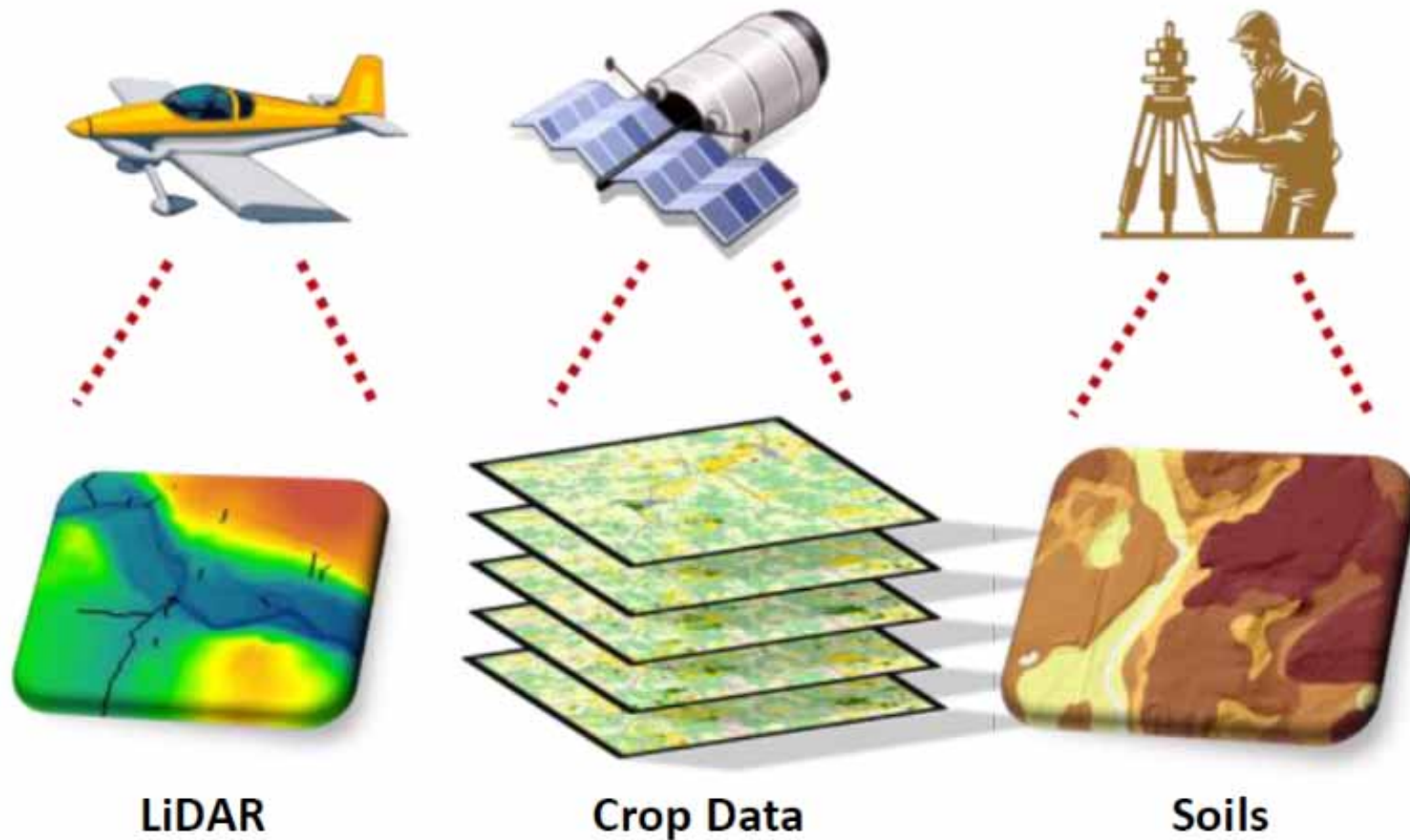


# Watershed



- 23 square miles
- 187 farms
- 1,129 fields

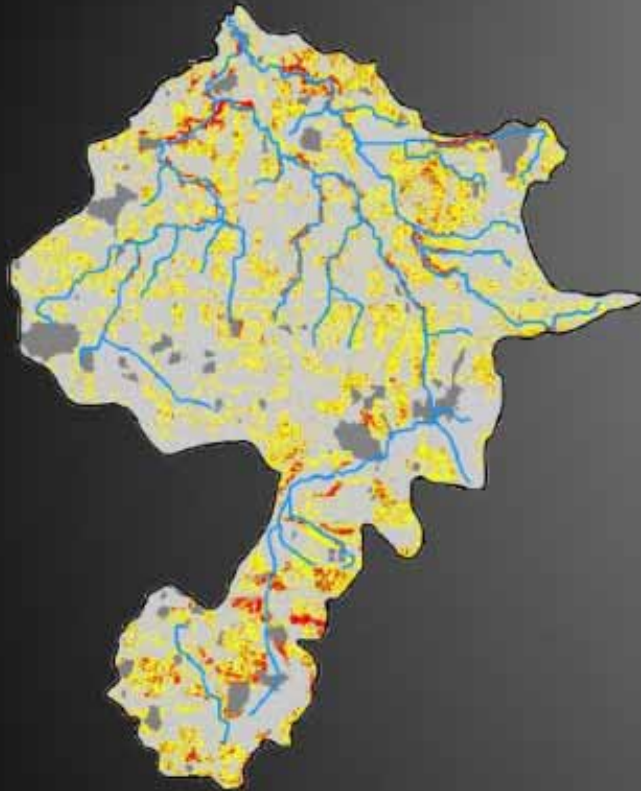
# Available Datasets



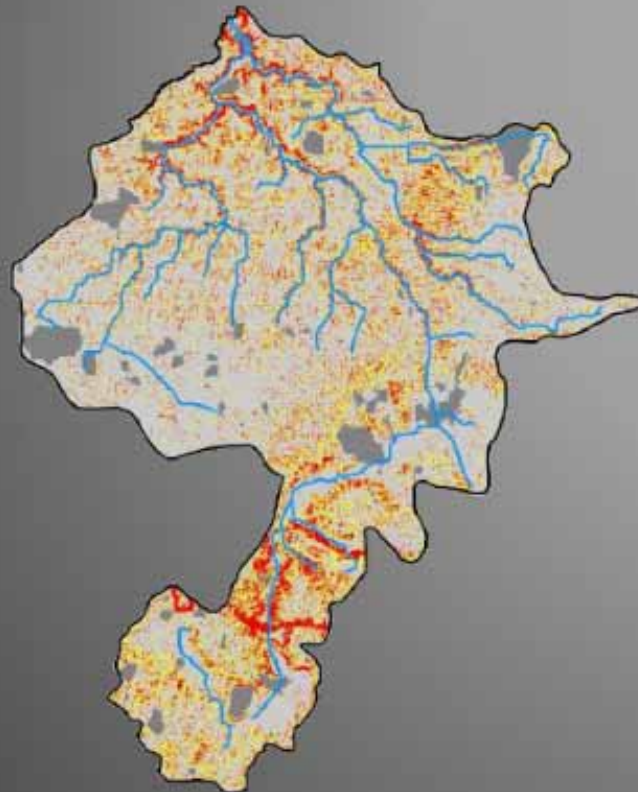


# Results

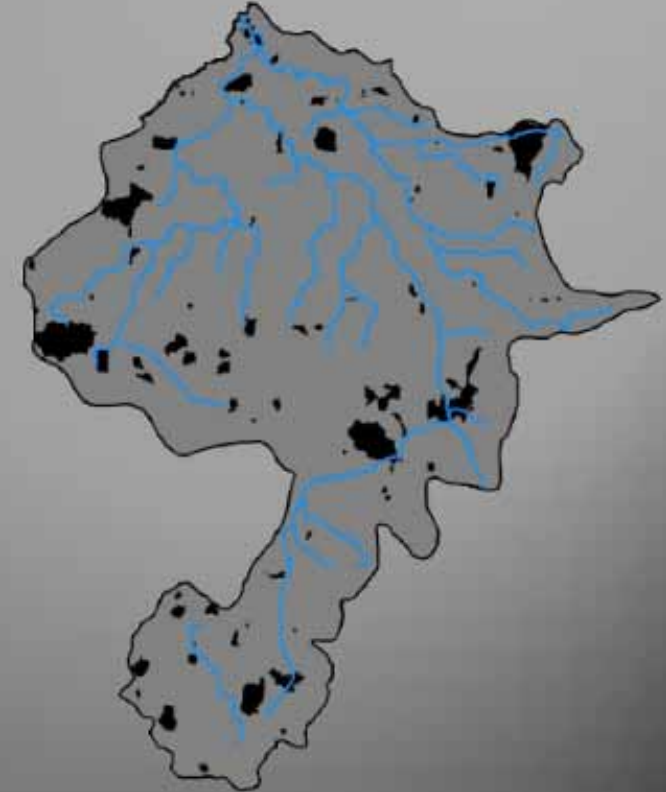
USLE



SPI

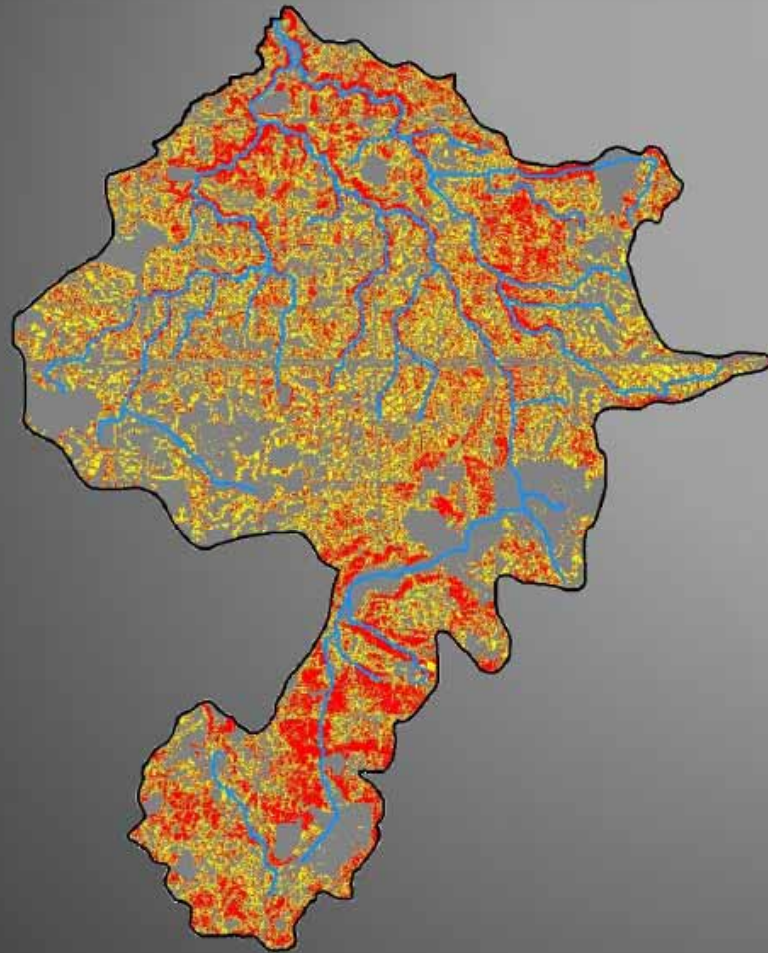


NC Areas



Low  
Medium  
High

# Results

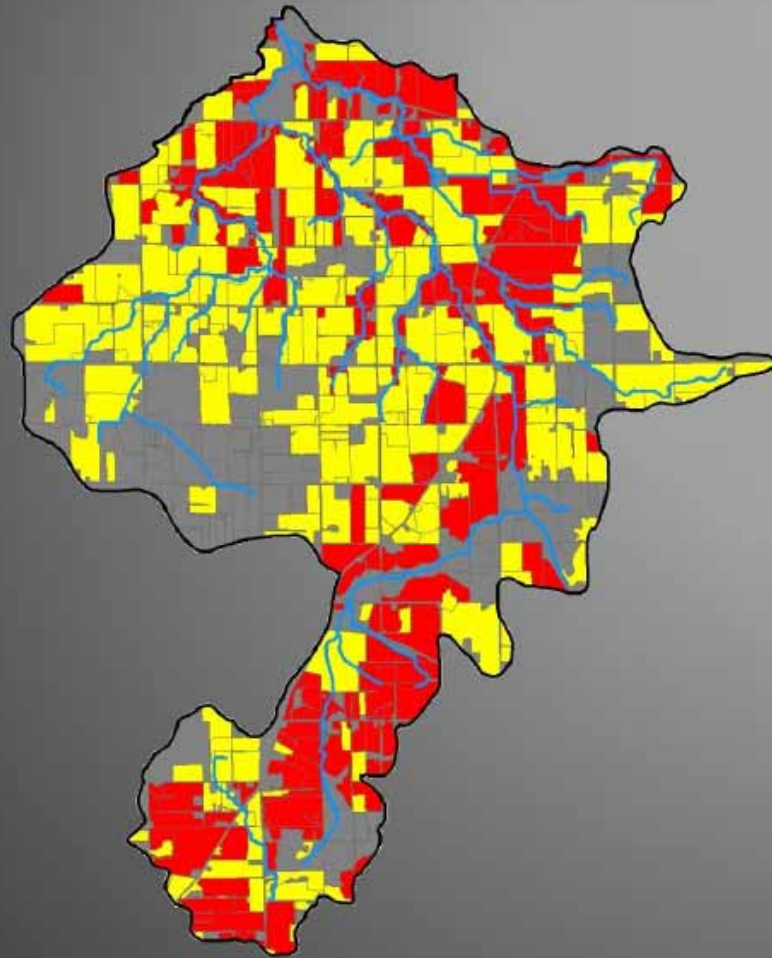


Erosion Vulnerability





# Results

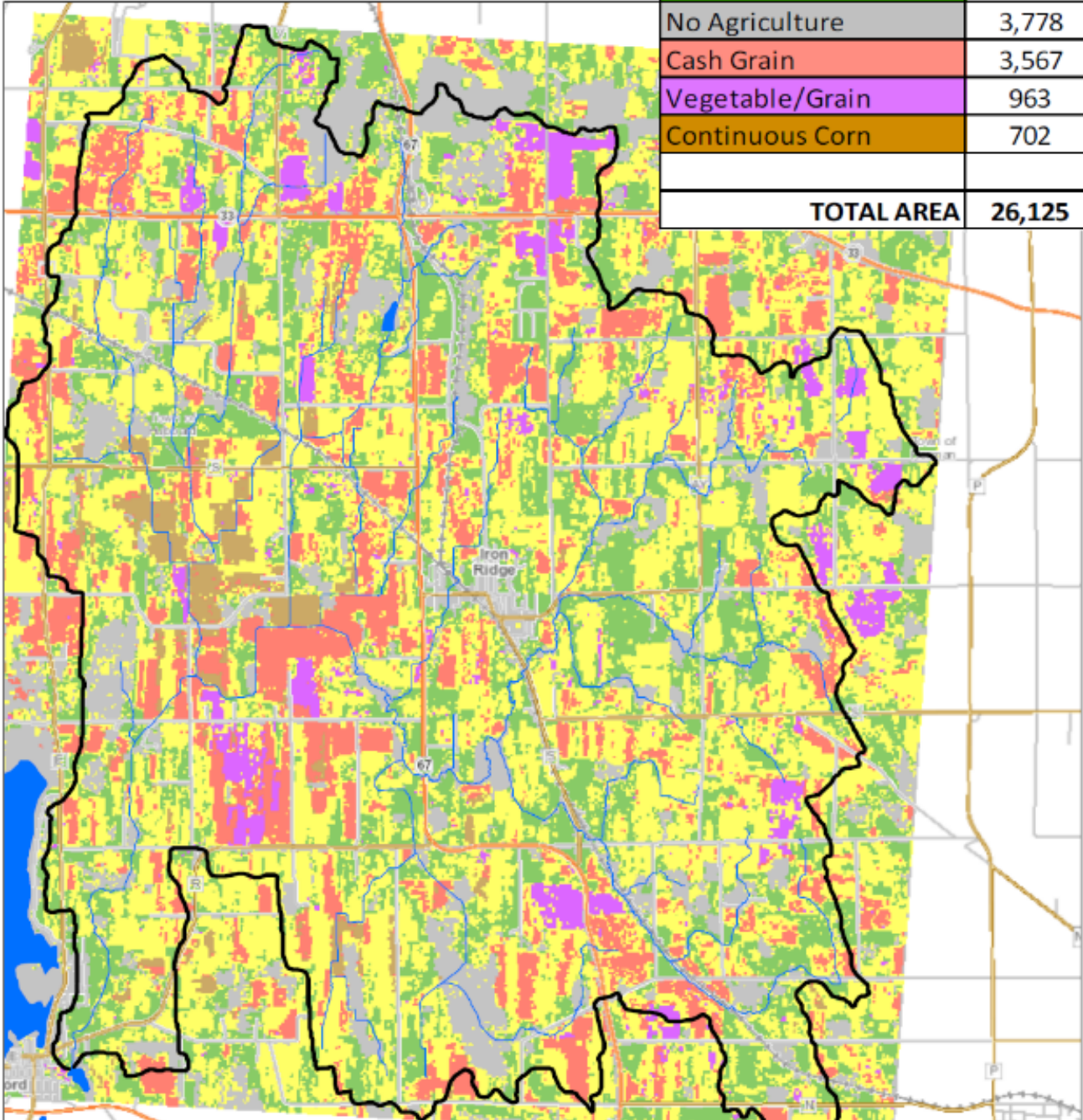


Erosion Vulnerability



# Wildcat Creek Crop Rotation Analysis 2009 - 2013

ROTATION	ACRES
Dairy	11,085
Pasture/Hay/Grassland	6,029
No Agriculture	3,778
Cash Grain	3,567
Vegetable/Grain	963
Continuous Corn	702
<b>TOTAL AREA</b>	<b>26,125</b>



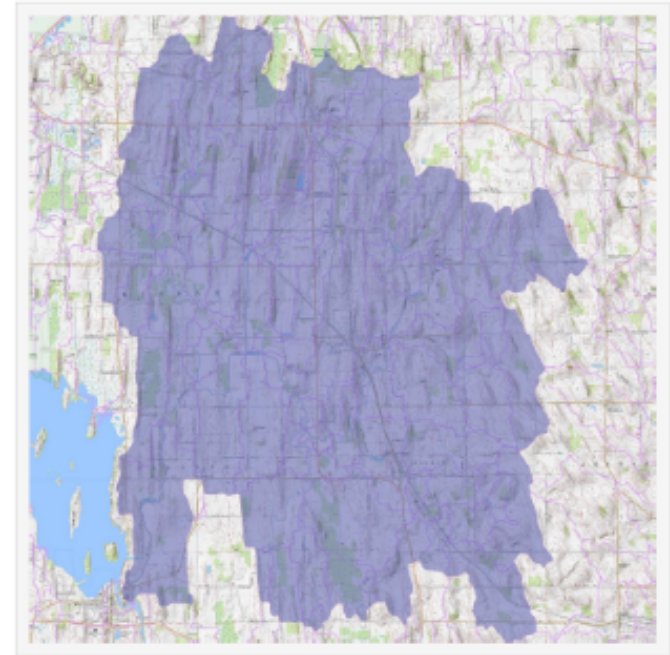


# Presto Lite

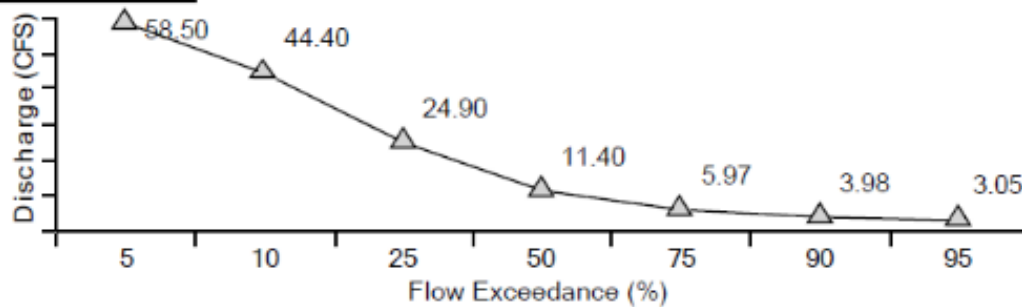
- **New online tool from DNR - released December 2016**
- **Part of DNR's Water Condition Viewer**  
<http://dnr.wi.gov/topic/SurfaceWater/wcv/>
- **Developed for Adaptive Management Projects**
- **Select watershed to get report with land cover and Phosphorus pollutant loads**
- **Can be used to develop 9 element watershed plans**
- **Similar output to EVAAL tool**

# PRESTO-Lite Watershed Delineation Report

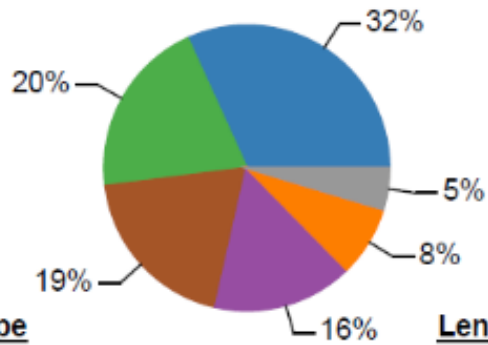
Reach ID: 200036623  
 Watershed Name: Wildcat Creek  
 Waterbody Name: Wildcat Creek  
 HUC08: Upper Rock River  
 Watershed Area: 40.82 mi<sup>2</sup>  
 Average Annual Precipitation: 32.72in



## Stream Flow

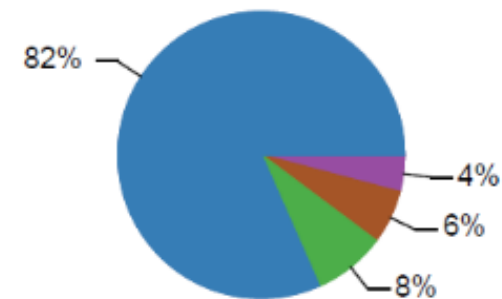


## Tributary Stream Type



Type	Length
Cool-Cold Headwater	41187 ft
Coldwater	26197 ft
Macroinvertebrates	25176 ft
Cold Headwater	20570 ft
Warm Headwater	10318 ft
Cool-Cold Mainstem	6072 ft
Cold Mainstem	0 ft

## Landcover



Type	Area
Agriculture	32.8 mi <sup>2</sup>
Forest	3.29 mi <sup>2</sup>
Urban	2.43 mi <sup>2</sup>
Wetland	1.67 mi <sup>2</sup>
Barren	0.38 mi <sup>2</sup>
Grassland	0.19 mi <sup>2</sup>



# DNR's Lake and Watershed Spreadsheet Tool

- **Created in 2016**

<http://dnr.wi.gov/topic/surfacewater/models.html>

- **All Wisconsin Lakes > 5 acres area/size**
- **Provides lake watershed land cover, estimated pollutant loads and other information**
- **Can be used alone or in tandem with STEPL or SNAP+ to develop 9 element watershed plans**

# DNR's Lake and Watershed Spreadsheet Tool

WBIC	805400
HYDROID	600091109
OFFICIAL_NAME	Lake Mendota
LOCAL_NAME	Fourth Lake, Lake Mendota
WATERBODY_TYPE	LAKE OR POND
COUNTY	Dane
LAKE_AREA_ACRES	9,781
MAX_DEPTH_FT	83
MEAN_DEPTH_FT	42
VOLUME_ACRE_FT	413231
Q_MEAN_CFS	130
RESIDENCE_TIME_LOW_DAY	1,000
RESIDENCE_TIME_MED_DAY	1,600
RESIDENCE_TIME_HIGH_DAY	2,400

DRAINAGE_AREA_ACRES	149,247
NPS_ACRES_RURAL_RES	23,639
NPS_ACRES_MED_URB	4,709
NPS_ACRES_HIGH_URB	1,200
NPS_ACRES_PAST_GRASS	28,588
NPS_ACRES_ROW_CROP	68,202
NPS_ACRES_FOREST	6,758
NPS_ACRES_WETLAND	5,116
NPS_ACRES_WATER	10,907
RIP_GRASS_PCT	19.2

P_LOAD_EC_LOW	36,906
P_LOAD_EC_MED	75,320
P_LOAD_EC_HIGH	207,875



# A Citizen's Guide to Watershed Planning

in WISCONSIN



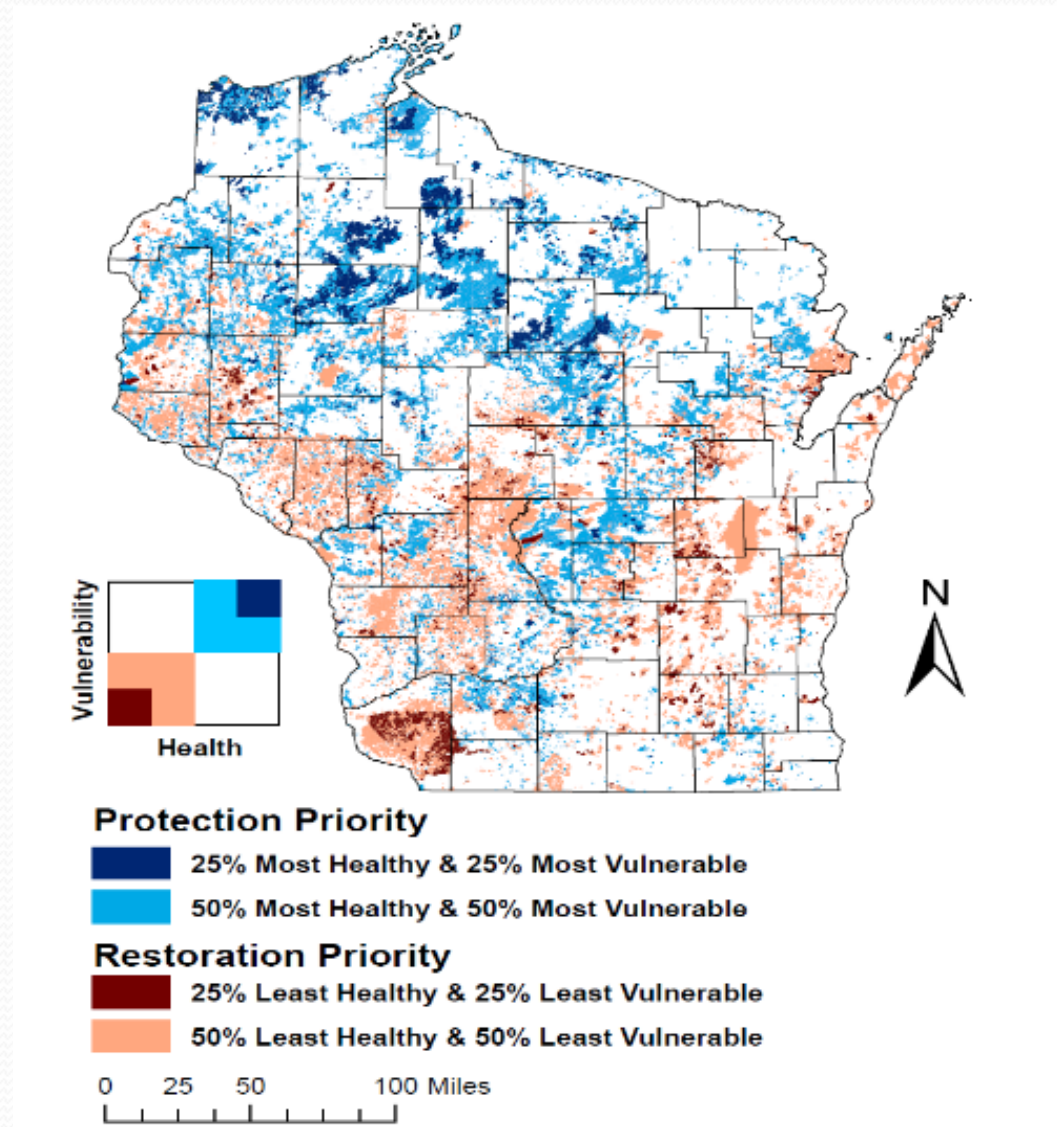
*The Framework for Protecting or Restoring Local Water Resources*

Your watershed  
determines the  
health of your  
wetlands, lakes  
and streams

[fyi.uwex.edu/watershedplanning](http://fyi.uwex.edu/watershedplanning)



# DNR Healthy Watersheds Assessment



<http://dnr.wi.gov/topic/watersheds/hwa.html/>



# DNR 9 Key Element Web Page

- [dnr.wi.gov](http://dnr.wi.gov) - keyword: **9 Key**

[http://dnr.wi.gov/topic/nonpoint/9keyelementplans.t...](#) This page can't be displayed Nine Key Element Plans - W...

Convert Select  
Internet Explorer cannot d... Suggested Sites Web Slice Gallery

Business Licenses & Regulations Recreation Education Contact Join DNR Search or Keywords

## Nine key element watershed plans

Implementing plans on a watershed basis to restore and protect Wisconsin's waters

Overview Maps Plans Guidance Tools Funding

### Overview

Watershed plans consistent with EPA's nine key elements provide a framework for improving water quality in a holistic manner within a geographic watershed. The nine elements help assess the contributing causes and sources of nonpoint source pollution, involve key stakeholders and prioritize restoration and protection strategies to address water quality problems.

### Understanding the nine key elements

Development of watershed-based plans funded with Section 319 funds must be consistent with [EPA's nine elements \[PDF\]](#). The elements can be used in watersheds with impaired waters or used to protect watersheds not yet impaired.

#### Summary of the nine minimum elements

- Identify the causes and sources
- Estimate pollutant loading into the watershed and the expected load reductions
- Describe management measures that will achieve load reductions and targeted critical areas
- Estimate the amounts of technical and financial assistance and the

[http://dnr.wi.gov/topic/Nonpoint/aboutUrban.html](#) ree elements characterize and set

### Nonpoint source pollution

### Agricultural nonpoint source pollution

Learn more about agricultural nonpoint source pollution.

### Urban nonpoint source pollution

Learn more about urban nonpoint source pollution.

### What you can do

Learn more about controlling nonpoint source pollution in your area.

### TMDL implementation

Learn more about what the DNR is doing to control nonpoint source pollution.

9 Key Element watershed



# Contact Information

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