

# Vilas County Land and Water Resource Management Plan 2015 – 2024



October 2014



**Vilas County  
Land and Water Conservation Department,  
and  
North Central Wisconsin Regional Planning  
Commission**

**Land and Water  
Resource Management Plan  
2015-2024**

**Prepared under the direction of the  
Vilas County Land and Water Conservation Committee:**

Wally Beversdorf, Chair

Art Kunde, Vice Chair

Kim Simac

Mary Kim Black

Paul Hennes

Cover Photo: Star Lake  
Photo Credit: Jan Abramczyk Nowacki on Pinterest

## Acknowledgements

Vilas County Land and Water Conservation would like to thank the following individuals who gave of their time by serving on the resource advisory committee. These persons provided valuable input into the development of the plan:

Fred Heider	North Central Wisconsin Regional Planning Commission > Planner
Chris Stark	Vilas County – UW Extension > Resource Agent
John Annin	Black Oak Lake Association
Sandy Gillum	Washington Lakes' Task Force > Vilas County Lakes & Rivers Association > Anvil Lake Association
Patrick Goggin	UW Extension Lakes Program > Statewide Lake Specialist
Rollie Alger	Vilas County Lakes & Rivers Association > Imogene Lake Association
Ted Ritter	Vilas County – Land & Water Conservation Department > Invasive Species Coordinator
Mariquita Sheehan	Vilas County – Land & Water Conservation Department > Conservation Specialist
Barb Gibson	Vilas County – Mapping Department > Administrator
Dawn Schmidt	Vilas County – Zoning Department > Administrator
Adam Grassl	Vilas County Mapping Department > GIS Specialist
Kevin Gauthier	WDNR – Northern Region > Lake Management Coordinator
Steve Peterson	WDNR Northern Region Forest Administrator
Steve Budnik	Vilas County Lakes & Rivers Association >
Ralph Sitzberger	Vilas County Board > Land & Water Conservation Committee
Paul Hennes	Vilas County Board > Land & Water Conservation Committee > Lost Lake District Commissioner
Michael Stinebrink	Natural Resource Conservation Service > District Conservationist
Matthew Peplinski	Farm Service Agency > Regional Director
Carolyn Scholl	Vilas County – Land & Water Conservation > County Conservationist
Lisa Trumble	DATCP > Planning Review Specialist
Norm Wetzel	Lac du Flambeau Town Lakes Committee

# Table of Contents:

<b>Executive Summary .....</b>	<b>1</b>
<b>Chapter 1: Plan Development and Public Participation .....</b>	<b>7</b>
Plan Development Timeline .....	7
Public Participation.....	8
<b>Chapter 2: Resource Assessment.....</b>	<b>12</b>
Location and Geography.....	12
Land Use .....	13
Demographics .....	13
Population and Housing.....	13
Demographic Trends.....	15
Employment.....	16
Land Resources .....	17
Geology and Physiography .....	17
Soils.....	17
Rare Species and Natural Communities .....	18
Wildlife .....	20
Agriculture .....	21
Soil Erosion from Cropland .....	21
Cranberry Farm Nutrient Management.....	21
Forestry .....	22
Soil Erosion from Woodlands.....	22
Terrestrial Invasive Species .....	22
Terrestrial Invasive Species .....	23
Water Resources .....	25
Basin and Watersheds .....	25
Groundwater .....	26
Surface Water	
River Drainage System .....	26
Lakes and Streams .....	26
Wetlands .....	29
Water Designations	
Outstanding and Exceptional Resource Waters.....	30
Impaired Waters – 303(d) Waters.....	30
Lakes Classification.....	31
Aquatic Invasive Species .....	32
Susceptibility of Groundwater To Contaminants .....	34
Drinking Water Test Results.....	35
Municipal Wellhead Protection Plans and Ordinances.....	36
Landfills .....	37
Contaminated Sites .....	37
Overall Resource Concerns.....	37

<b>Chapter 3: 2010-2015 Work Plan Accomplishments.....</b>	<b>53</b>
Information and Education .....	53
Legislative Action.....	55
Technical Assistance.....	56
Grants / Funding .....	59
Coordination / Administration .....	59
<b>Chapter 4: Work Plan 2015-2019.....</b>	<b>61</b>
<b>Chapter 5: Tools, Education, Regulation, and Evaluation .....</b>	<b>77</b>
Management Tools and Proposed Project Summaries.....	77
Healthy Watersheds Initiative Mapping .....	77
Geographic Prioritization Mapping .....	79
Phosphorus Load Reduction Estimate Project.....	79
County Lakes & Watersheds Project.....	80
Clean Boats/Clean Waters Program.....	81
Information and Education Strategy .....	81
Performance Standards and Prohibitions .....	82
Enforcement Process.....	85
Regulations .....	85
Assessment, Monitoring, and Evaluation .....	86
Coordination .....	87
<b>Chapter 6: Glossary.....</b>	<b>89</b>

## **Maps:**

Map 1	Location
Map 2	Natural Resources
Map 3	Curly-Leaf Pondweed
Map 4	Eurasian Watermilfoil
Map 5	Spiny Water Flea
Map 6	Designated Waters
Map 7	Lake Classification
Map 8	General Soils
Map 9	Soil Susceptibility to Groundwater Contamination
Map 10	Existing Land Use
Map 11	Land & Resource Protection
Map 12	Aquatic Ecosystem Health
Map 13	Watershed Vulnerability
Map 14	Health and Vulnerability
Map 15	Landscape Condition
Map 16	Aquatic Invasive Species

## **Attachments:**

- A. Public Hearing Notice
- B. Nutrient Management Conservation Practice Standard
- C. NR151 Performance Standards and Prohibitions Fact Sheets
- D. Conservation Cost Share Program Policy – Tier Level Practices
- E. Wetland Plants of Concern

# 2015-2024 EXECUTIVE SUMMARY

## Introduction

The Vilas County Land and Water Resource Management Plan is drafted as a 10-year plan (2015-2024) with a 5-year Work Plan (2015-2019) in accordance to the requirements set forth in Chapter 92 of the Wisconsin Statutes.

## Plan Development

To assist in the revision of the land and water resource management plan, Vilas County Land and Water Conservation invited participants from a variety of resource protection agencies, interested citizens, and lake groups to discuss and prioritize conservation concerns, which became the *Resource Advisory Committee* (RAC). The RAC met twice (**Jan. 9, 2014** and **July 8, 2014**) to create, refine, and prioritize the goals. Additional tasks completed by the RAC at the second meeting included reviewing the **draft work plan**, and to review the draft resource assessment section of the document. After some discussion and debate on **July 8<sup>th</sup>** the committee suggested that some the goals be combined and prioritized. Land and Water Conservation Department personnel further refined the goals, objectives, and tasks of the work plan and re-worked the 6 goals from the RAC into the final 5 goals listed in the Work Plan.

On **July 30, 2014**, the revised draft work plan and assessment chapters were emailed to RAC members and Vilas County Land & Water Conservation Committee members for additional review and comments; work plan was sent to DATCP for review.

The **September 4, 2014** public hearing on the plan was noticed twice in the official newspaper.

**October 7, 2014** – Presentation of Plan to the Wisconsin Land and Water Conservation Board.

**October 2014** – DATCP sends letter adopting the plan following LWCB recommendations.

**November 12, 2014** – Adoption of the plan by the Vilas County Board of Supervisors.

## Resource Assessment

Brief summaries of the land and water resources in Vilas County, and how they may have changed over the past 5 years, are described in this chapter. Resource concerns are identified at the end of many sections. This information provides a general background on how trends may impact the land and water resources in Vilas County.

### Location and Geography

Vilas County is located in northern Wisconsin and is bound by Upper Michigan to the north, Forest County to the east, Oneida County to the south, and Iron and Price Counties to the west. The County is approximately 651,529 acres in size, of which about 84% (549,573 acres) are of land, and about 15.6% (101,577 acres) are water. Public and private forests cover about 77% of the county.

## Demographics

Vilas County's 2000 and 2012 U.S. Census counts are compared in Table 2 on page 15. There are notable fewer people under 18 years old in the county in 2012 vs. 2000, and notably more residents over 65 now living in the county. The negative natural increase is due in part, to the county's comparatively high median age of 51 years (the 2nd highest in the state) and low relative crude birth rate (9th lowest among the state's 72 counties). The key driver to Vilas's population change, net migration, was more than eight times that of the state and more than four times that of the nation, compensating for negative natural increase. The American Indian population has increased by the same percent as the White population has declined over roughly the last decade. Median household income has risen over the last decade, but not faster than inflation.

Seasonal dwellings are a significant part of the housing stock in the county (57%); far greater than the 6.1% of housing for the state. Only the City of Eagle River has less than 35% of its housing listed as seasonally occupied.

## Land Use

Vilas County is characterized by well developed forests and its abundance of lakes and streams. The total surface area in the County is 651,529 acres, of which 81% is forested, about 15% is water, 2% of the County is agricultural lands, and the remaining 2% of the land is developed land uses (residential, commercial, industrial, & transportation) as shown on the Map 6–Existing Land Use. In Vilas County the water table is close to the surface, which is evident because almost 1/5 of the county (121,258 acres) is covered with wetlands, many of which are also forested.

## Agriculture

The soils of Vilas County are primarily sandy and loamy soils which are suited to, and do support, forested/woodland uses. Due to the sandy and droughty nature of the soils, most are of relatively low agricultural value; in addition, the growing season in the county is rather short.

Most agricultural production in the County consists of forage crops, oats, potatoes, and cranberry bogs. A short growing season limits cropping. Some farms have begun selling their crops directly to consumers through *community supported agriculture*.

Soil erosion from croplands is not a major source of pollution in Vilas County since so little of the county is farmed. However, soil erosion from many other cumulative sources around the county are considered and addressed. Technical assistance to various focus groups and educational outreach to the general public are important components of the county conservation program.

A voluntary educational approach will continue to be used to achieve erosion control standards in Vilas County. One-on-one contacts with landowners and operators who request technical assistance is the most common method used to promote soil conservation in Vilas County.

## Forestry

Vilas County is characterized by well developed secondary growth forests with a mixture of



hardwoods and conifer stands, covering 81% of the County. About half of the forestland in Vilas County is publicly owned; see **Map 7–Land & Resource Protection**.

Vilas County Forestry Department requires that all foresters conducting county forest harvests use Best Management Practices to harvest timber responsibly. The county forest is independently certified as sustainable by Sustainable Forestry Initiative® (SFI®).

#### Terrestrial Invasive Species

Not all terrestrial plants classified in Wisconsin as invasive pose the same environmental or economic threat to all regions of the state. Some are of great concern in agricultural areas while of lower priority in areas dominated by woodlands and wetlands, and vice versa. The Wisconsin Headwaters Invasives Partnership (WHIP), serving Vilas and Oneida Counties, places highest priority for early detection monitoring and rapid response management on species classified as “Prohibited,” which are those species that are not yet well established, and early detection could enable effective control. Of secondary priority to WHIP are plants classified as “Regulated,” which are well established and beyond hope of managing in many areas of Wisconsin, but not yet common within the WHIP region. Detecting those species along roadsides and other areas where they are likely to first appear will present opportunities to slow or stop their advance locally.

#### Lakes and Rivers

The county is the source area of major river systems. Brule, Elvov, and Kentuck Creeks drain about 10% of the county into the Brule and Menominee Rivers, which empty into Lake Michigan. The Wisconsin River and its tributaries drain about 40% of the county. Bear, Manitowish, and Turtle Rivers and Squaw Creek also drain about 40% of the county into the Flambeau River, which empties into the Mississippi River. Presque Isle River and Tenderfoot Creek drain about 10% of the county into Lake Superior.

One of the highest concentrations of natural lakes in the world is found in Vilas County along with Oneida County to the south. In Vilas County alone there are over 1,320 lakes (563 with names, and 757 without names). Numerous rivers and streams are also located within Vilas County. There are 35 cold-water streams and 116 warm water streams.

Eight natural lake reservoirs exist, and are controlled by the Wisconsin Valley Improvement Company (WVIC). These reservoirs are Lac Vieux Desert, Twin Lakes, Buckatabon, Long-on-Deerskin (Long Lake and Sand Lake), Little Deerskin, Lower Nine Mile, Little St. Germain, and Big St. Germain. The total acreage of these reservoirs is 14,872 acres. The WVIC stores water in reservoirs during wet periods, and releases water during dry periods to maintain uniform water flow in the Wisconsin River for hydroelectric purposes.

A watershed ranking process was developed by WDNR to rank watersheds based on the extent of nonpoint source pollution, the effect on water quality, and the ability to manage the pollution sources. WDNR was part of the RAC discussions that decided to remove the watershed rankings from this plan, because the rankings from the 2002 Headwaters Basin Plan (previously cited in the plan) are no longer valid, and that there is no newer assessment at this time.

There are 104 (34 more than in 2009) lake organizations in Vilas County. Ten of the organizations are lake districts, which have taxing authority, and the remaining organizations are voluntary lake associations.

### Aquatic Invasive Species

The aquatic invasive species program in Vilas County has evolved since 2004 to concentrate efforts in three areas:

1. Public awareness and prevention
2. Early detection presence/absence monitoring, particularly for species that can be managed.
3. Effective management of manageable species (plants)

### Impaired Waters [303(d) Waters]

In 2014 there were 30 waterbodies in Vilas County on the 303(d) list, which is up from 24 waterbodies in 2008. Most of these waterbodies are listed due to fish consumption advisories for mercury contamination, with “total phosphorus” being the other major reason for water impairment. See **Map 3–Designated Waters** for all the *impaired waters* countywide.

### Outstanding and Exceptional Resource Waters

Outstanding resource waters (ORW) in Vilas County include 13 lakes (12 lakes in 2009); 9 creeks and springs (same in 2009); and 1 river (4 rivers in 2009). Exceptional resource waters (ERW) in Vilas County include 11 creeks and springs; and 2 rivers. See **Map 3–Designated Waters** for all the ORWs and ERWs countywide.

### Groundwater

Groundwater in Vilas County is generally of good quality. The County is susceptible to groundwater contamination in most areas due to the predominance of sandy soils and shallow depth to groundwater. See **Map 5–Susceptibility to Groundwater Contamination**. Local differences in groundwater quality are the result of the composition, solubility, and surface of the soil and rock through which the water moves, and the length of time that the water is in contact with these materials.

### 2010-2015 Work Plan Accomplishments

Accomplishments and activities completed from the 2009-2014 Vilas County Work Plan are summarized in Chapter 4. Knowing what has been completed or needs more attention helps us to determine which actions to continue when creating the next 5-year Work Plan. Land and Water Conservation Department and Land Conservation Committee accomplishments are described here in the following categories: Information and Education, Legislative Action, Technical Assistance, Grants and Funding, Coordination and Administration. Most of the categories are then further defined to describe specific elements.

Work Plan Accomplishment categories:

#### INFORMATION and EDUCATION

Youth Education; Media / Publications; Conservation Observance Day; Presentations; Professional Development; and Special Professional Recognition

## LEGISLATIVE ACTION

Action by Resolution regarding environmental sensitivity or financial matters; and Public Representation and Participation

## TECHNICAL ASSISTANCE

Cost-Share Conservation Projects; Vilas County Groundwater Study and Education Project; Vilas County Terrestrial Invasives Inventory Project; Cost-Share Policy – Tier System; Aquatic Invasive Species Partnership; Wisconsin Headwaters Invasive Partnership; Point-Intercept Macrophyte Surveys; Grant Program Assistance; Water Level Issues/Dam Maintenance; and AIS Clean Boats/Clean Waters Program

## COORDINATION / ADMINISTRATION

Partnerships; Group Assistance; Sponsorship; Volunteers; and Administration

### **5-year Work Plan**

Our mission *to protect the county's natural communities from degradation* will be implemented through the following work plan over the course of a five year period, beginning in 2015 and extending through 2019.

The goals are listed below in order of priority as determined by the Vilas County Land and Water Conservation Committee/Department in association with recommendations from the *Resource Advisory Committee*.

- Goal 1: Increase the publics' level of natural resource knowledge and stewardship
- Goal 2: Protect aquatic and terrestrial environments from non-point source pollutants
- Goal 3: Protect aquatic, terrestrial, and wetland ecosystems from invasive species
- Goal 4: Organize sites of concern within watersheds, wetlands, lakes, and forests
- Goal 5: Attend to state and local conservation funding and policy issues

Soil erosion from croplands is not a major source of pollution in Vilas County since so little of the county is farmed. However, soil erosion from many other cumulative sources around the county are considered and addressed. Technical assistance to various focus groups and educational outreach to the general public are important components of the county conservation program. See the complete Work Plan in Chapter 4.

### **Performance Standards and Enforcement**

A voluntary educational approach will continue to be used to achieve agricultural erosion control standards in Vilas County. One-on-one contacts with landowners and farmers who request technical assistance is the most common method used to promote soil conservation in Vilas County.

For the **priority farm strategy**, a general approach to providing information to all farms will occur with Work Plan activities. If a farm has a significant water quality problem, we will work with the landowner to bring them into compliance.

The primary emphasis of the **cost-share program** in Vilas County continues to be implementation of shoreland stabilization practices and restoration of native vegetation in order

to reestablish riparian buffer areas, and to reduce soil erosion by installing erosion control practices. Healthy buffer zones reduce nonpoint source pollution and impede soil erosion.

Land disturbance activities that are subject to stormwater management and erosion control are outlined under: **Non-Agricultural Performance Standards** on page 82.

A landowner who is out of compliance with State performance standards and prohibitions and refuses technical and financial assistance from the LWCD will be notified by mail that they are subject to enforcement actions.

#### Assessment, Monitoring, and Evaluation

An annual assessment of the Land and Water Resource Management Work Plan will be implemented by both quantifiable and qualifying means to determine the overall accomplishments or specific successes of a given objective or activity. Quantifiable tracking measures will be assessed annually and in instances of longer term activities or programs that do not dictate a means to measure numerically (On-Going or As-Needed), activity progress will be measured by a qualifying means.

Conservation plans, which plan individual crop fields to the tolerable soil loss rate or "T", are prepared for participants in the Farmland Preservation Program. Participation is through voluntary 10-25 year individual agreements, because there is minimal agricultural zoning in Vilas County. The Vilas County Land and Water Conservation Department manages agreements for Farmland Preservation Program.

Citizen volunteers watch our lakes through participation in the Citizen Lake Monitoring Network (CLMN) program. Vilas County supports volunteer monitoring efforts and will continue to encourage lake associations, lake property owners, and lake users to participate in the CLMN program.

As required within the operation and maintenance portion of the contract agreement signed between a landowner and Vilas County, a landowner must maintain installed practices for a minimum of ten years following project completion and distribution of reimbursement funding. County staff will run compliance checks and monitor practices annually on a minimum of 10 previously implemented conservation practices and maintain records of such in project files.

#### Coordination

The LWCD staff seeks cooperation from and works closely with a diverse group of agencies, associations, and organizations involved in resource management and protection in Vilas County. Each agency, organization, association, and individual has its individual resource issues, programs, and plans; but cooperatively we can work together for the greater good of Vilas County's land and water resources.

# **PLAN DEVELOPMENT AND PUBLIC PARTICIPATION**

## **Chapter 1**

### **INTRODUCTION**

The Wisconsin State Legislature amended Chapter 92 of the Wisconsin State Statutes in 1997 to require the counties to develop 5-year or 10-year land and water resource management plans. Plans are to be developed through a locally-led planning process that gives counties greater responsibility in the overall provision of conservation programs within their boundaries.

Chapter 92 has clearly defined roles and responsibilities. The Department of Agriculture, Trade and Consumer Protection (DATCP) has the primary responsibility to set state conservation program policy. County land and water conservation committees (LWCC's), through their respective land and water conservation departments, have primary responsibility for implementation of conservation programs within their jurisdiction. Both DATCP and county land and water conservation committees have joint responsibility to develop and administer the conservation programs. Chapter ATCP 50 (the Soil and Water Resource Management Administrative Rule) further articulates land and water resources management planning program roles and responsibilities.

The development of this document provides Vilas County with guidance to address the natural resource needs of the county over the next ten years. It also provides an opportunity for Vilas County to further develop and expand coordination with other partners and agencies involved in resource management to accomplish the goals and objectives identified in the plan.

### **PLAN DEVELOPMENT TIMELINE**

The Vilas County Land and Water Resource Management Plan was developed during calendar year 2014 in cooperation with the North Central Regional Planning Commission (NCWRPC).

A chronological history of the plan update activities is as follows:

- November 1, 2013 – Background of the Land and Water Resource Management Plan was discussed at the Land Conservation Committee meeting
- November 14, 2013 – A meeting invitation was emailed to a wide array of potential resource advisory committee members
- December 6, 2013 – Meeting with NCWRPC to discuss revision
- January 9, 2014 – the first Resource Advisory Committee (RAC) meeting was held at the courthouse in Eagle River and 14 people attended.
- February – June, 2014 – Development of draft table of contents, resource assessment, and work plan chapters

- May 2, 2014 – Meeting of new Land & Water Conservation Committee (LWCC), 4 newly elected members; concept of the land & water resource management plan was introduced and two members were assigned to participate on the resource advisory committee
- July 8, 2014 – a second meeting of resource advisory committee was held to discuss first drafts of resource assessment and work plan; goals discussed and prioritized; 12 persons attended
- July 30, 2014 – Revised drafts of work plan and assessment emailed to resource advisory and county land & water conservation committees for additional review and comments; work plan was sent to DATCP for review
- July - August 2014 – Revisions to drafts; compilation and revision of remaining sections of the document
- August 4, 2014 – action by LWCC to set Public Hearing for September 4, 2014
- August, 2014 – continue compiling draft of complete document; tables, maps, appendices
- August 20, 2014 – First Class II Notice published in the Vilas News Review for the September 4, 2014 Public Hearing
- August 27, 2014 – Second Class II Notice published in the Vilas News Review for the September 4, 2014 Public Hearing
- August 28, 2014 – completed draft document emailed to LWCC and to DATCP for review
- September 4, 2014 – Review of draft document and county board resolution by LWCC
- September 4, 2014 – Public Hearing for draft of Land and Water Resource Management Plan
- September 5, 2014 – Revisions to draft document were made after the public hearing and committee comments.
- October 7, 2014 – Presentation of the Vilas County Land and Water Resource Management Plan to the Wisconsin Land and Water Conservation Board
- October 2014 – DATCP sends letter adopting the plan following LWCC recommendations
- November 12, 2014 – Adoption of the plan by the Vilas County Board of Supervisors

## **PUBLIC PARTICIPATION**

To assist in the revision of the land and water resource management plan, Vilas County Land and Water Conservation invited participants from a variety of resource protection agencies, interested citizens, and lake groups to discuss and prioritize conservation concerns. A *Resource Advisory Committee* (RAC) was assembled and met on two occasions during calendar year 2014. Representatives from a wide variety of backgrounds and agencies participated in the meetings.

Membership of the RAC was comprised of interested citizens; lake organizations; town lake committees; county personnel from the Mapping, Zoning, and Land & Water Conservation Departments; county board supervisors; state personnel from WDNR, DATCP, and UW Extension; the Wisconsin Wetlands Association, and federal personnel from NRCS.

During the first committee meeting on **January 9, 2014**, the RAC learned about the Land and Water Resource Management planning process and communicated their concerns about natural resource issues in Vilas County. The list of goals from the previous work plan (2010-2015) was revisited by the group as a starting point. The full group was broken into sub-groups in order to use their time more effectively during the meeting and to generate more information. Sub-group discussions identified the following issues and concerns: Increased swimmers itch, lake water levels, water quality, a need for watershed assessments, a need to audit existing lake management plans and assist lake groups with plan implementation, protecting forestlands, a need to create lake status report cards, protecting shorelands, groundwater contamination, expansion of town lake committee programs, BMP's for farmers, a need for Lake District Commissioner training, aquatic & terrestrial invasive species, and a need for wetland education programs.

Input from the RAC was noted and the concerns were then sorted and summarized into the following 9 goals. Participants were reminded to look at the last 10 years, because these goals would serve the county for the next 10 years instead of 5 years, as the current plan was for 5 years. The actions under these goals would be reviewed at the 5 year mark though. Many of the issues and concerns were similar to the current plan with a few minor changes. The most notable of those differences were the addition of a more robust wetlands program and the need to identify priority resource areas within the county. Goals were drafted for the current revision to address the resource concerns as follows:

- Goal 1: Areas affected by soil disturbance, development, and/or pollutants are addressed
- Goal 2: The integrity and species diversity of Terrestrial Ecosystems are addressed
- Goal 3: The integrity and species diversity of Aquatic Ecosystems is maintained
- Goal 4: Guidance and support is provided to lake groups
- Goal 5: Groundwater and surface waters are monitored and protected
- Goal 6: Harmful affects to wetland ecosystems are minimized
- Goal 7: Areas of potential soil erosion, forest fragmentation, wetland loss, and impaired waters are identified and prioritized
- Goal 8: The publics' level of natural resource knowledge and stewardship is increased
- Goal 9: Matters of state and local conservation funding & policy are considered

The RAC met again on **July 8, 2014** to refine and prioritize goals, review the draft work plan, and to review the draft resource assessment section of the document. After some discussion and debate, the committee suggested that some the goals be combined and prioritized as follows:

- Goal 1: Prevent, control and manage aquatic and terrestrial invasive species
- Goal 2: Increase awareness, protection, and restoration management of wetlands
- Goal 3: Increase the publics' knowledge of natural resources and stewardship
- Goal 4: Groundwater and surface waters are monitored and protected

- Goal 5: Identify, prioritize, and improve areas affected by soil disturbance, development, and/or pollutants
- Goal 6: State and local conservation funding & policy are considered

Land and Water Conservation Department personnel further discussed the goals, objectives, and tasks of the work plan and re-worked the 6 goals mentioned above into the final 5 goals listed below:

- Goal 1: Increase the public's level of natural resource knowledge and stewardship
- Goal 2: Protect aquatic and terrestrial environments from non-point source pollutants
- Goal 3: Protect aquatic, terrestrial, and wetland ecosystems from invasive species
- Goal 4: Organize sites of concern within watersheds, wetlands, lakes, and forests
- Goal 5: Attend to state and local conservation funding and policy issues

Activities that have been **added** specifically for the current revision include:

- Support Vilas County representatives elected to serve on the WI Land & Water Conservation Association (WLWCA) board.
- Invite area legislators to LWCC meetings and/or regional association meetings for communication exchanges. Elected officials from the area will be invited to join monthly meetings of the Land and Water Conservation Committee to encourage them to support county and state conservation related issues.
- Create and move resolutions forward to the county board that support funding of county conservation staff.
- Use of LiDAR to assess areas of the county where potential soil erosion and vulnerability is highest.
- Begin Lakes & Watersheds Projects to audit lake grants, Rank Watershed Health, and share Health Status Information with the public. A watershed approach to planning will begin with the WDNR supported Lakes & Watersheds Projects. Three phases of the project will help to focus limited resources and staff onto tasks and areas in the county that are ranked as high priority; create Lake status report card.
- Estimate P Load Reductions from Nonpoint Sources using the STEPL model in priority areas. Vilas County will formally begin the process of calculating total Phosphorus levels within each watershed, as well as estimate reductions in the P load over a given time period. The simple STEPL model will be utilized to accomplish this activity.

The Land and Water Conservation Committee placed a Class II notice in the *Vilas County News Review* and held a **public hearing** at the Vilas County courthouse in Eagle River on September 4, 2014 at 9:00 a.m. The hearing was held specifically to solicit public feedback and comments on the draft 5 year work plan and the 10 year draft plan document. Three people, in addition to Committee and staff members, were present for the hearing for a total of 11 people. A committee member and a member of the public both made public comments on the plan. Overall, those in attendance had positive comments on the existing plan with a few minor changes suggested.



Based on the commentary received at the public hearing, and the comments after the hearing from Land and Water Conservation Committee members, the following changes were made to the Work Plan or overall draft plan:

- a. Added a map of BRRTS to the plan.
- b. Comment received that chloride levels in private wells at the intersection of USH 45 & STH 70 are very high, and are probably caused by salting the roads in winter.
- c. Added Healthy Watershed maps.
- d. List all 5 Work Plan goals under the Budget Estimate table in the Work Plan chapter.
- e. Revise Introduction paragraphs in the Plan Development and Public Participation chapter.
- f. Add Executive Summary, Work Plan accomplishments, and any other parts that DATCP and DNR reviewers suggest.

# RESOURCE ASSESSMENT

## Chapter 2

### INTRODUCTION

Brief summaries of the land and water resources in Vilas County, and how they may have changed over the past 5 years, are described in this chapter. This information provides a general background on how trends may impact the land and water resources in the County. Developing an understanding of these characteristics and their changes will help direct future planning efforts in the appropriate directions. This chapter is not intended to contain an exhaustive inventory of land and water resources in Vilas County. Instead, it draws upon existing inventories and information from previously prepared reports.

In 1971 the Vilas County Resource and Conservation Needs bulletin was created to identify the natural resources at that time.

Throughout this chapter will be notes taken from the 1971 bulletin and placed in these blue boxes for comparison.

### LOCATION and GEOGRAPHY

Vilas County is located in northern Wisconsin and is bound by Upper Michigan to the north, Forest County to the east, Oneida County to the south, and Iron and Price Counties to the west. The County is approximately 651,529 acres in size, of which about 84% (549,573 acres) are of land, and about 15.6% (102,276 acres) are water. Public and private forests cover about 77% of the county.

Vilas County is located in the Northern Highlands ecological landscape. Studded with thousands of mostly small kettle lakes, this area epitomizes the image of "Up North." This enormous concentration of lakes is a result of the pitted outwash plain left by glaciers and is believed to be the third highest concentration of lakes in the world. (Wisconsin Land Legacy Report)

The area's other key characteristic is its forests. White and red pines, once forming the largest pine forests in the state, dominated the uplands. By the early 1900s, these great forests were largely harvested to feed the mills supplying wood to cities further south. Aspen and other trees common to earlier succession forests are now common in many areas. Significant stands of older hemlock-hardwood forest occur in several parts of this ecological landscape. (Wisconsin Land Legacy Report)

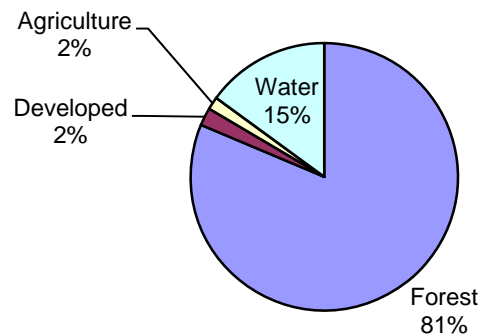
Development pressure in this ecological landscape is intense and focused along lake shores and rivers. There are now more than 12,500 seasonal homes in Vilas County (U.S. Census), the overwhelming majority of which are located along lakes and flowages. Many are being converted to year-round residences. Land use in the uplands is largely oriented towards timber and pulp production. Recreation is also important and contributes significantly to the local

economy. Some of the wetlands around Manitowish Waters are used for cranberry production. (Wisconsin Land Legacy Report)

## LAND USE

Vilas County is characterized by well developed forests and its abundance of lakes and streams. The total surface area in the County is 651,529 acres, of which 81% is forested, about 15% is water, 2% of the County is agricultural lands, and the remaining 2% of the land is developed land uses (residential, commercial, industrial, & transportation) as shown on the **Map 6–Existing Land Use**.

**Figure 1: Countywide Land Use**



Source: NCWRPC GIS

# DEMOGRAPHICS

## A. POPULATION & HOUSING

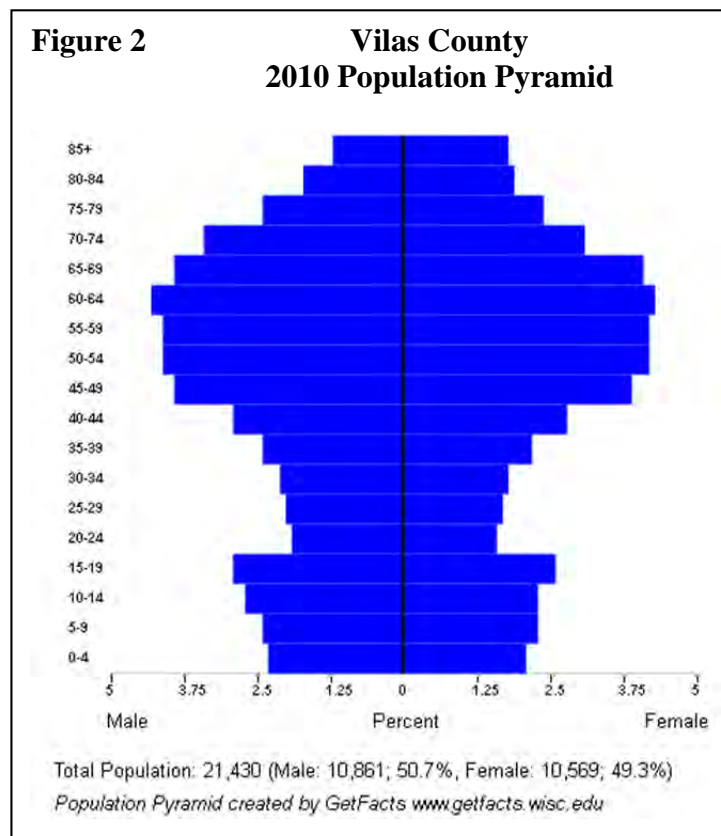
Population is projected to decline slightly over the next 5 years of this plan as seen in Table 1 (next page).

Figure 2 illustrates the county’s predominantly older population, which is comprised primarily of persons aged 45 and older. Median age in the county increased to 50.7 years old in 2010, from 45.8 years in 2000. The population is almost equally male and female until about 80 years and older when females outnumber males, as is expected due to females naturally longer life spans.

From 2000 to 2012 the population of the 17 and younger group declined from 20.7% to about 17.2% of Vilas County's population.

**Figure 2**

**Vilas County  
2010 Population Pyramid**



Year	2010 Census	2015	2020
Population	21,430	21,140	20,946

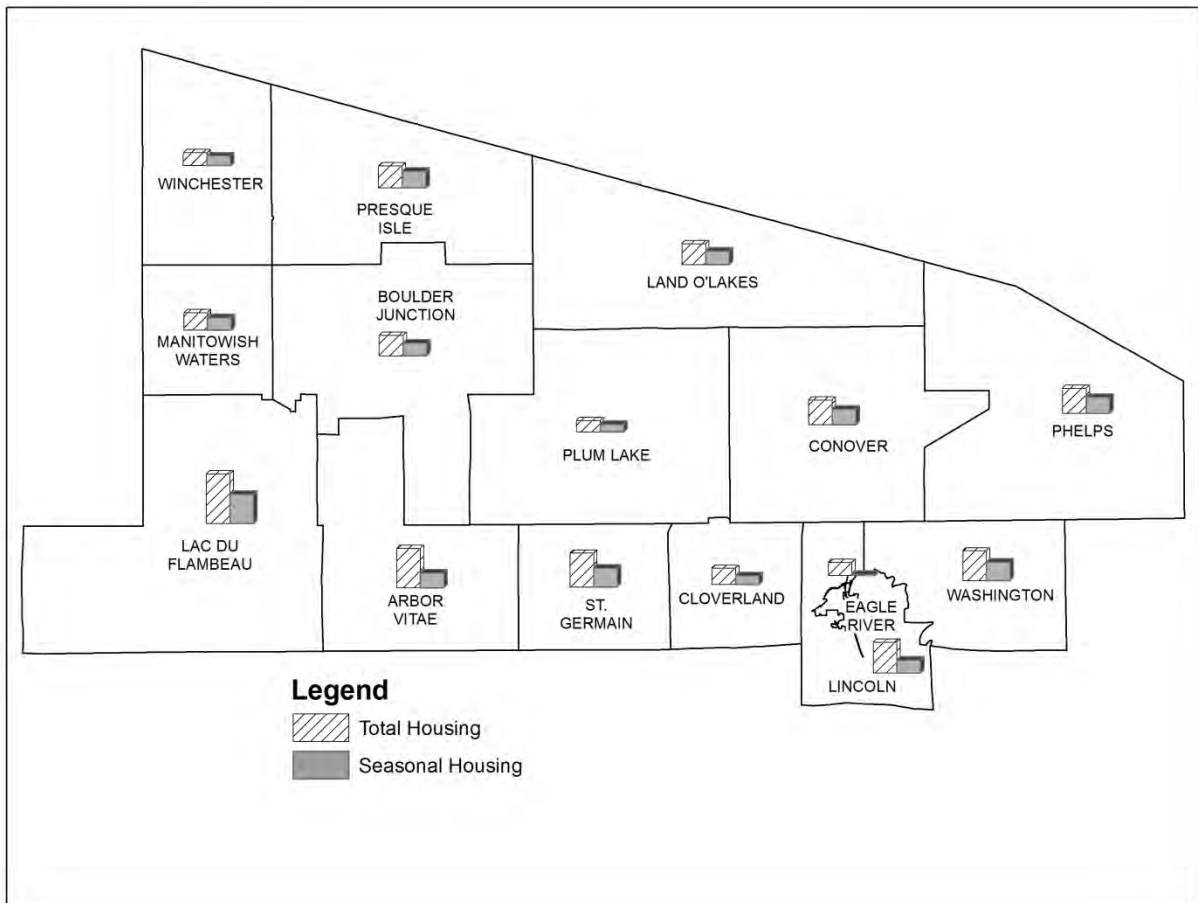
Source: U.S. Census, and Wisconsin Department of Workforce Development

Seasonal dwellings are a significant part of the housing stock in the county (57%); far greater than the 6.1% of housing for the state. Only the City of Eagle River has less than 35% of its housing listed as seasonally occupied.

Figure 3 shows that 9 of the 14 towns, seasonal dwellings are more than 60% of all housing units; with Presque Isle and Winchester both having over 75% of housing that is seasonally occupied.

The trend over the last 20 years has been for seasonal home owners to retire in Vilas County, thus becoming permanent residents in their former “cottages.” New permanent and seasonal homes are being built too. Both of these trends are projected to continue.

**Figure 3 Permanent and Seasonal Housing, 2010**



Source: 2010 U.S. Census

## B. DEMOGRAPHIC TRENDS

Table 2 shows a comparison between the last two U.S. Census counts for Vilas County. There are notable fewer people under 18 years old in the county in 2012 vs. 2000, and notably more residents over 65 now living in the county. The American Indian population has increased by the same percent as the White population has declined over roughly the last decade. Median household income has risen over the last decade, but not faster than inflation.

The Office of Economic Advisors (OEA) within the Wisconsin Department of Workforce Development creates countywide workforce profiles that include some demographic data. In 2011, OEA provided the following population perspective:

Vilas County's population increased 11.4% between 2000 and 2010. During this time, the county's population grew at a much faster rate than the state or nation and ranked as the 8th fastest-growing county among Wisconsin's 72 counties.

Net migration plus natural increase equals population growth. The negative natural increase is due in part, to the county's comparatively high median age of 51 years (the 2nd highest in the state) and low relative crude birth rate (9th lowest among the state's 72 counties). The key driver to Vilas's population change, net migration, was more than eight times that of the state and more than four times that of the nation, compensating for negative natural increase.

	2000 Census	2012 ACS
Population	21,033	21,338
Persons under 5 years	4.3%	4.2%
Persons under 18 years	20.7%	17.2%
Persons 65 years and over	22.8%	27.6%
Female persons	50.2%	49.4%
White persons (not Hispanic)	89.7%	87.1%
Black persons	0.2%	0.3%
American Indian persons	9.1%	11.0%
Asian persons	0.2%	0.3%
Hispanic or Latino persons	0.9%	1.4%
High school graduates or higher*	85.4%	91.4%
Bachelor's degree or higher*	17.6%	23.5%
Housing units	22,397	25,196
Average household size	2.29	2.01
Median household income	\$33,759	\$41,195

Source: U.S. Census, 2000, 2010, & U.S. Census' American Community Survey (ACS) 2007-2011

\*percentage of persons age 25 and over

### C. EMPLOYMENT

Overall, the labor force has increased from about 9,800 in 2000 to over 10,600 in 2010 (Table 3). That represents an increase of 7.6 percent. The labor force is defined simply as the number of persons, sixteen and over, employed or looking to be employment. Persons over sixteen who are students, homemakers, retired, institutionalized, or unable/unwilling to seek employment are not considered part of the labor force.

	2000	2010
Labor Force	9,869	10,622
Employed	9,268	9,542
Unemployment Rate	6.1%	5.8%
Participation Rate	57.3%	57.7%

Source: Source: U.S. Census Bureau, 2008-2010 American Community Survey; and NCWRPC

Table 4 contains industry level employment data along with annual employment change. Almost 61 percent of the total job base was employed in the Trade, transportation, utilities sector; Education & health sector, or the Leisure & hospitality employment sector.

Industry	Employment	
	Annual Avg.	1-Year Change
Natural Resources	57	-5
Construction	497	-34
Manufacturing	359	-25
Trade, Transportation, Utilities	1,416	-29
Information	NA	NA
Financial Activities	275	0
Professional & Business Services	272	-16
Education & Health	1,002	-52
Leisure & Hospitality	2,110	-139
Other services	380	21
Public Administration	917	52

Source: WI DWD, Bureau of Workforce Training, Quarterly Census Employment and Wages, June 2011

## LAND RESOURCES

### A. GEOLOGY and PHYSIOGRAPHY

Vilas County is in the Northern Highland physiographic region of Wisconsin. This region has some of the highest elevations in the state. Elevations range from about 1,560 feet above sea level in an area along Squaw Creek in the southwest corner of the county to 1,845 feet at Muskellunge Hill. Elevations differences between high and low points are low, as seen between Squaw Creek and Muskellunge Hill. The City of Madison's elevation in Dane County is 863 feet above sea level. State and federal forests were established in this region from tax delinquent lands in part to protect the headwaters of major statewide rivers that drain north to south.

There are three geographic regions in Vilas County. The drumlins and ground moraines in the eastern portion of the county are characterized by low, smoothly rounded, elongated, and oval ridges that are nearly level to moderately steep, and are interspersed with long, narrow drainage ways. The Winegar moraine area in the western portion of the county is characterized by short, steep slopes and ridges, and by numerous wet depressions, most of which have no outlets. Outside of these moraine areas is an outwash plain, characterized by a rolling or hilly topography with many enclosed basins and depressions. In scattered areas on this plain are sand flats and the communities of Eagle River, Manitowish Waters, Conover, St. Germain, and Boulder Junction.

### B. SOILS

The soils of Vilas County are primarily sandy and loamy soils which are suited to, and do support, forested/woodland uses. Due to the sandy and droughty nature of the soils, most are of relatively low agricultural value; in addition, the growing season in the county is rather short.

The following provides a general discussion of the general soil associations found within Vilas County. It should be noted, however, that these general descriptions are only guidelines and should be referred to as such.

The majority of the county (42%) is dominated by the Rubicon-Sayner-Karlin association which includes most of the southern and central portions of the county. The far eastern portion of the county, including primarily the Town of Phelps and portions of Conover and Washington, is dominated by the Champion and Padus-Pence associations. The Champion association comprises 8% of the county and the Padus-Pence association comprises approximately 21%. The Padus-Pence association is also found along the Presque Isle/Boulder Junction border, in the central portion of Land O' Lakes, the Sayner and Star Lake areas, and the majority of southern/central Arbor Vitae. The majority of Winchester and Presque Isle and approximately half of Land O' Lakes, are comprised of the Gogebic-Pence-Fence association which comprises approximately 14% of the county. The Crosswell-Dawson-AuGres association is found scattered throughout the county, comprising a total of 8% of the soils. The Loxley-Dawson association and the Keweenaw-Karlin association comprise the remaining 2% and 5% of the county's land

area, respectively. These areas are also scattered throughout the county.

See Soils Map

### C. RARE SPECIES and NATURAL COMMUNITIES

Areas of critical environmental sensitivity are those unique areas of the natural environment that should be preserved, and therefore excluded from intensive development. Typically, areas of critical environmental sensitivity include wetlands, floodplains, floodways, shorelands, areas of steep slope (especially those adjacent wetlands and shorelands), publicly-owned scientific and natural areas (e.g. fish & wildlife habitats), and identified cultural and archaeological sites. The protection of such areas is intended to:

- 1.) protect the health, safety, and welfare of the general public;
- 2.) protect surface water and groundwater quality;
- 3.) reduce damage from flooding and stormwater runoff; and
- 4.) maintain important wildlife habitats or recreational areas.

*Aesthetics, 1971*

*“Areas need development to grow economically but we also need areas of wilderness. A shoreline occupied by a beaver or nesting loon cannot also be occupied by people.”*

Most of the known areas of critical environmental sensitivity within Vilas County are already managed or regulated at the federal, state, and county levels. Wetlands, floodplains, shorelands, and state natural areas are all publicly regulated.

The WDNR maintains a listing of all rare, threatened, and endangered species and natural communities within the state. A listing of the species and communities which exist in Vilas County is available by town on the DNR’s website under: *Natural Heritage Inventory*.

A comprehensive inventory does not exist, but when rare species or rare natural communities are found, then they are entered into the NHI.

See the FORESTRY section, **Map 7 – Land & Resource Protection** for more information about publicly-owned lands.

#### State Natural Areas (SNAs)

State natural areas were acquired to protect the state’s natural diversity, provide sites for research and environmental education, and serve as benchmarks for assessing and guiding use of other lands in the state. Natural areas are defined as tracts of land or water, which have native biotic communities, unique natural features, or significant geological or archeological sites. These sites do not have much facility development, though there may be a designated trail on the site.

The Department of Natural Resources listed the following areas within Vilas County:

CNNF = Chequamegon-Nicolet National Forest

NHAL = Northern Highland American Legion (State Forest)



1. **Allequash Lake and Pines SNA (No.508)** is 398 acres located in the NHAL State Forest.
2. **Anvil Lake Trail SNA (No. 449)** is 980 acres located in the CNNF.
3. **Aurora Lake SNA (No. 127)** is 250 acres located in the NHAL State Forest.
4. **Beaver Creek SNA (No. 478)** is 697 acres located in the CNNF.
5. **Bittersweet Lakes SNA (No. 34)** is 1,070 acres located in the NHAL State Forest.
6. **Black Tern Bog SNA (No. 49)** is 26 acres located in the Town of Arbor Vitae.
7. **Blackjack Springs SNA (No. 308)** is 1,395 acres located in the CNNF.
8. **Border Lakes SNA (No. 411)** is 2,383 acres located in the Town of Presque Isle.
9. **Camp Lake and Pines SNA (No. 506)** is 243 acres located in the NHAL State Forest.
10. **Chippewa Trail SNA (No. 440)** is 897 acres located in the CNNF.
11. **Day Lake SNA (No. 189)** is 209 acres located in the NHAL State Forest.
12. **Devine Lake and Mishonagon Creek SNA (No. 507)** is 1,186 acres located in the NHAL State Forest.
13. **Dunn Lake SNA (No. 237)** is 954 acres located in the Town of Presque Isle.
14. **Haymeadow Creek SNA (No. 479)** is 957 acres located in the CNNF.
15. **Headwater Lakes SNA (No. )** is 2,893 acres located in the CNNF.
16. **Johnson Lake Barrens and Springs SNA (No. 107)** is 1,125 acres located in the NHAL State Forest.
17. **Kentuck Lake SNA (No. 442)** is 291 acres located in the CNNF.
18. **Lake Alva Birch-Hemlock SNA (No. 509)** is 314 acres in the NHAL State Forest.
19. **Lake Laura Hardwoods SNA (No. 500)** is 852 acres in the NHAL State Forest.
20. **Lost Canoe SNA (No. 108)** is 1,119 acres located in the NHAL State Forest.
21. **Mary Lake SNA (No. 264)** is 44 acres located in the Town of Presque Isle.
22. **Nell Lake SNA (No. 672)** is 117 acres located in the NHAL State Forest.
23. **Nixon Lake SNA (No. 186)** is 737 acres located in the NHAL State Forest.
24. **Trout Lake Conifer Swamp SNA (No. 21)** is 25 acres located in the NHAL State Forest.
25. **Papoose Creek Pines SNA (No. 503)** is 563 acres located in the NHAL State Forest.
26. **Pat Shay Lake SNA (No. 446)** is 736 acres located in the CNNF.
27. **Plum Lake Hemlock Forest SNA (No. 26)** is 747 acres located in the NHAL State Forest.
28. **Rice Creek SNA (No. 504)** is 435 acres located in the NHAL State Forest.
29. **Spruce Grouse Swamp SNA (No. 540)** is 400 acres located in the Town of Conover.

30. **Toy Lake Swamp SNA (No. 22)** is 2,308 acres located in the NHAL State Forest.
31. **Trout River SNA (No. 505)** is 108 acres located in the NHAL State Forest.
32. **Upper Buckatabon Springs SNA (No. 609)** is 279 acres located in the Town of Conover.
33. **Van Vliet Hemlocks SNA (No. 673)** is 412 acres located in the NHAL State Forest.

## **D. WILDLIFE**

The wildlife in Vilas County is representative of the northern forested areas. Common mammals found in the county include black bear, white tailed deer, coyote, porcupine, beaver, red fox, snowshoe hare, otter, raccoon, skunk, red and gray squirrel, mink, muskrat, and other small animals. Rare mammals include timber wolf, fisher, bobcat, and pine marten.

Ruffed grouse and woodcock are common upland game birds. The county is a migration path for some ducks and geese. Wood ducks, mallards, black ducks, and blue winged teal are common throughout the county. Loons, herons, bald eagles, osprey, and several species of hawks, owls, woodpeckers, and songbirds inhabit the county. Bird watching opportunities are plentiful in Vilas County.

The abundance of wildlife species depends on the timber types and the stages of tree growth. Timber and pulp cutting practices play a large role in determining the dominant tree species and the mixture of growth stages and thus the wildlife species that can thrive.

Permanently sodded, grassy openings within the forest, many originating from old log landings, camps, old farms, or frost pockets are vital components of forest wildlife habitat. In County Forestlands, an effort is being made to maintain and improve the quality and, in some cases, the quantity of openings.

### Wildlife Resource Concerns

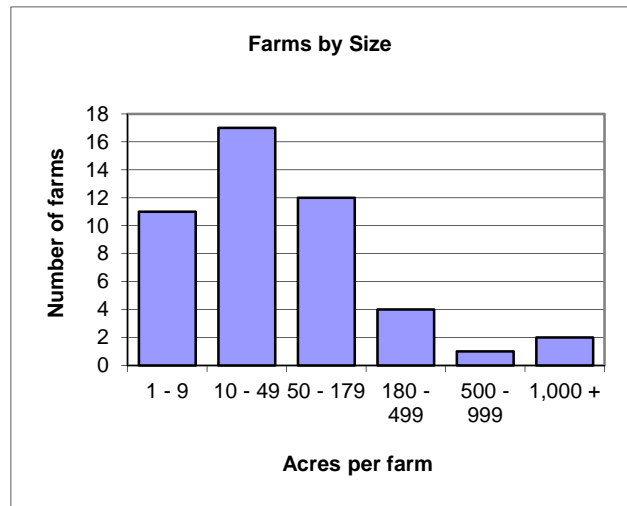
- Increased populations of nuisance wildlife:
  - Waterfowl - with the attendant problems such as deposits of feces and being potential reservoirs of swimmer's itch.
  - Overabundance of deer – deer feeding stations attract large herds of deer, which also eat and/or damage native vegetation and landscaping.
  - Simplification of animal communities including birds, small mammals, and amphibians. Sometimes these changes can contribute to cascading changes including increases in disease carrying tick populations
- Loss of habitat due to residents “tidying” up their shorelines. A 1996 study determined that some developed lakes in Vilas County are 200 years behind in the amount of coarse woody habitat (fallen trees) that should be in the lake compared to undeveloped lakes. Similarly, loss of native structure provided by vegetation and fallen trees on shore contributes to a loss of native amphibian, mammalian, and insect species.

## E. AGRICULTURE

According to the 2012 USDA Census of Agriculture there was a 30.8% decrease in agricultural land since 2007.

The number of farms decreased from 71 (2007) to 47 (2012). There were 6,881 acres in farmland in 2012, which is a decrease from 9,942 acres in 2007.

Most agricultural production in the County consists of forage crops, oats, potatoes, and cranberry bogs. A short growing season limits cropping. Some farms have begun selling their crops directly to consumers through Community Supported Agriculture (CSA).



Source: 2012 Census of Agriculture

### Soil Erosion from Cropland

Croplands are located mainly in near Eagle River, Phelps, and Woodruff, with scattered cropland elsewhere. Concern regarding cropland erosion is generally low in the County because of the limited amount of croplands and low erosion rates.

The State requires each County to prepare a Soil Erosion Control plan. In 1997 the Vilas County Board approved a resolution asking the Department of Agriculture Trade and Consumer Protection (DATCP) to grant them a waiver from preparing this plan. Since Vilas County has relatively small amounts of cropland and the magnitude and extent of cropland erosion is small, Vilas County was granted a waiver from DATCP to release them from their obligation to develop a Soil Erosion Control plan.

A voluntary educational approach will continue to be used to achieve erosion control standards in Vilas County. One-on-one contacts with landowners and operators who request technical assistance is the most common method used to promote soil conservation in Vilas County.

### Cranberry Farm Nutrient Management

Cranberry bogs are located mainly in Manitowish Waters. There is concern about nutrients applied to cranberry bogs, because flooded bogs may drain directly to surface waters. All of the cranberry bogs in Vilas County have nutrient management plans.

Wet harvesting begins the night before the harvest. The grower floods the dry bog with up to eighteen inches of water. The next day, water reels, nicknamed "egg beaters", are used to stir up water in the bogs. The cranberries are loosened from the vines and float to the surface of the water. They are corralled and loaded into trucks. The berries are then delivered to a central receiving station where they undergo a thorough sorting process. After the bog is harvested, the

water is pumped to another bog, and the process starts over again.

All Wisconsin farmers are required, by the State of Wisconsin, to have a nutrient management plan in place that meets the NRCS Nutrient Management Conservation Practice Standard (the so-called “590 Standard”). The NRCS guidelines for cranberry nutrient management are included within Wisconsin Conservation Planning Technical Note WI-1, which is a companion document to the 590 Standard. See **Attachment B** for a copy of this document.

## F. FORESTRY

Vilas County is characterized by well developed secondary growth forests with a mixture of hardwoods and conifer stands, covering 81% of the County. About half of the forestland in Vilas County is publicly owned; see **Map 7–Land & Resource Protection**. Vilas County has 40,991 acres in county forest, the DNR has 144,593 acres in the Northern Highland–American Legion State Forest, and 54,648 acres of forestland is part of the Chequamegon-Nicolet National Forest.

*Woodlands, 1971*

*“It takes time to grow a high quality tree—more than half a man’s lifetime for an aspen, twice a lifetime for maple.”*

### **Soil Erosion from Woodlands**

The primary concern in protecting soil is to make sure areas where soil is exposed are covered as soon as possible. Timber harvests may require either temporary or permanent road construction, which exposes areas to soil erosion.

Vilas County Forestry Department requires that all foresters conducting county forest harvests use Best Management Practices to harvest timber responsibly. The county forest is independently certified as sustainable by Sustainable Forestry Initiative® (SFI®). The SFI 2005-2009 Standard promotes sustainable forest management through nine principles, 13 objectives, 34 performance measures and 102 indicators developed by professional foresters, conservationists, scientists and others. The standard addresses key environmental, social and economic forest values – from water quality and biodiversity to harvesting and regeneration.

### **Terrestrial Invasive Species**

In 2002, the Wisconsin Council on Forestry was created by state statute to advise the Governor, Legislature, Department of Natural Resources, and other State agencies on issues affecting forests in the state. The Council is comprised of representatives of private and public forestry, timber and forest product industries, conservation organizations, forestry schools, and other interested groups. In 2004, the Council sponsored the Governor’s Conference on Forestry. The 64 participants who attended these discussions concluded that: “...invasive species may present the greatest threat to the long term health and sustainability of Wisconsin’s forests...” and reached “...a clear consensus on the need for voluntary invasive species best management practices and a partnership based process for creating them.” In response, the Council created the Forest Invasives Leadership Team (FILT) to help guide these efforts and identified four areas of concern for developing best management practices: 1) forestry, 2) recreation, 3) urban

forestry, and 4) transportation and utility rights-of-way.

**BMP U-9: Report infestations of invasive species to the appropriate land manager or property owner.**

Considerations:

- a. Provide as exact a location as possible; take a photo, GPS coordinates, or map the infestation.
- b. Use diplomacy if contacting a private landowner.

**BMP U-12: Spread the word – help educate others about invasive species and their effects on our environment, economy, and recreational opportunities.**

Resource Concern – Forest Fragmentation

The Society of American Foresters defines *forest fragmentation* as: “The process of dividing large tracts of contiguous forest into smaller isolated tracts surrounded by human modified environments.” In Vilas County the main causes of forest fragmentation are real estate development, road and trail development, and power line corridors. From 1980 to 2000 there was a 22% increase in housing in Vilas County.

Fragmentation degrades the quality of habitat for interior forest species that depend on large tracts of contiguous forest. Development in or near forested areas may reduce the amount of contiguous or undisturbed forest habitat, alter the structure of native vegetation, and potentially exacerbate the invasion of non-native invasive species. Timber harvests may be limited if housing development creates parcels that are too small for commercially viable harvests. Proximity to residential areas can also limit the range of management practices available in a forest, particularly limiting the use of controlled burns. (Forests Megatrends)

**G. TERRESTRIAL INVASIVE SPECIES – COUNTYWIDE**

Significant developments in recent years pertaining to terrestrial invasive plants include:

- Wisconsin Legislature’s adoption of an invasive species classification and rules law known as WDNR administrative rule NR40 which classified 67 terrestrial plants as either “Restricted” or “Prohibited” and attached rules to each classification.
- Formal creation of the Wisconsin Headwaters Invasives Partnership (WHIP), a multi-agency partnership serving Vilas and Oneida Counties. Vilas County is an active participant in the cooperative.
- Implementation in early 2014 of a highway rights of way invasive species management plan on all County highways and all numbered highways (State and Federal) within Vilas County. The management depends heavily on active participation from the County Highway Department road crew with supporting involvement by the Land & Water Conservation and Land Records Departments.

Public uptake of the Vilas County terrestrial invasives initiative has been far less enthusiastic than what was experienced when the aquatic invasives initiative was launched in late 2004. Local public perception of terrestrial invasives fails to recognize the long term environmental

and economic damage done by non-aquatic, non-native plants and animals. Continued public awareness, development of early detection monitoring programs and appropriate response to high priority species will be an ongoing objective of both WHIP and the Vilas County Land & Water Conservation Department for the foreseeable future.

#### Resource Concerns – TIS

Non-native plants generally alter or destroy habitat critical to the survival of native flora and fauna that have evolved together over time to be dependent on one another.

Not all terrestrial plants classified in Wisconsin as invasive pose the same environmental or economic threat to all regions of the state. Some are of great concern in agricultural areas while of lower priority in areas dominated by woodlands and wetlands, and vice versa. The Wisconsin Headwaters Invasives Partnership (WHIP), serving Vilas and Oneida Counties, places highest priority for early detection monitoring and rapid response management on species classified as “Prohibited,” which are those species that are not yet well established, and early detection could enable effective control. Some of those species include:

- Chinese yam (*Dioscorea opposita*)
- Japanese honeysuckle (*Lonicera japonica*)
- Japanese hops (*Humulus japonicus*)
- Giant hogweed (*Heracleum mantegazzianum*)
- Poison hemlock (*Conium maculatum*)
- Wild chervil (*Anthriscus sylvestris*)

Of secondary priority to WHIP are plants classified as “Regulated,” which are well established and beyond hope of managing in many areas of Wisconsin, but not yet common within the WHIP region. Detecting those species along roadsides and other areas where they are likely to first appear will present opportunities to slow or stop their advance locally. Some of those species include:

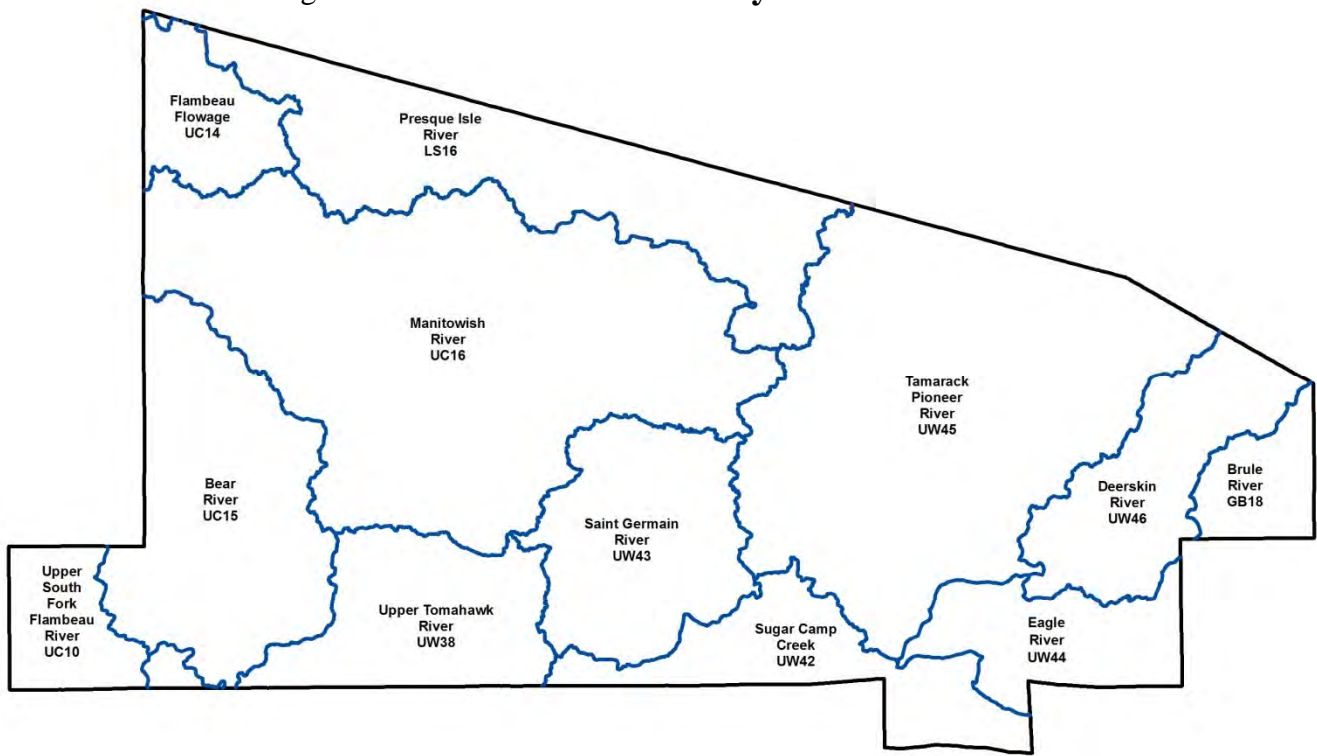
- Multiflora rose (*Rosa multiflora*)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Wild parsnip (*Pastinaca sativa*)
- Common reed (*Phragmites australis*)

# WATER RESOURCES

## A. BASIN AND WATERSHEDS

There are 13 watersheds contained completely or partially within Vilas County as shown on the **Watersheds Map (Figure 4)**. The majority of Vilas County drains into the Mississippi River. A small area in the eastern part of the County drains into Lake Michigan, and a small portion along the state line drains to Lake Superior.

Figure 4 Vilas County Watersheds



UC – Upper Chippewa River Basin

LS – Lake Superior Basin

UW – Upper Wisconsin River Northern Sub-basin

GB – Green Bay Basin

## **B. GROUNDWATER**

Groundwater is an important resource in Vilas County. It is the source of almost all water used for domestic, agricultural, commercial, and industrial purposes in the County.

According to the Vilas County Soil Survey report, most groundwater is obtained from sand and gravel aquifers. These aquifers occur as surficial sand and gravel deposits or as isolated buried deposits in most of the moraine areas of eastern and northwestern Vilas County. In the moraine areas, water is obtained mainly from lenses of saturated sand and gravel buried within or below the glacial till. Depth to these lenses range from 20-200 feet. Well yields generally range from 5-50 gallons per minute, but may reach as high as 200 gallons per minute. Wells in the moraine areas commonly are not subject to pollution. (Soil Survey)

The surficial sand and gravel deposits are mainly on extensive outwash plains. They are highly permeable and yield large quantities of water to wells. Most high capacity wells are 40 to 130 feet deep. Well yields range from 50 to 2,000 gallons per minute. Shallow wells in the areas of surficial outwash are subject to pollution. (Soil Survey)

Groundwater in Vilas County is generally of good quality. Local differences in quality are the result of the composition, solubility, and surface of the soil and rock through which the water moves, and the length of time that the water is in contact with these materials. The main components in the water are calcium, magnesium, and bicarbonate ions. Some groundwater in the moraines is hard. A large concentration of iron is in the groundwater throughout the County, but is not considered to be a health hazard. (Soil Survey)

## **C. SURFACE WATER**

### **RIVER DRAINAGE SYSTEM**

The county is the source area of major river systems. Brule, Elvov, and Kentuck Creeks drain about 10% of the county into the Brule and Menominee Rivers, which empty into Lake Michigan. The Wisconsin River and its tributaries drain about 40% of the county. Bear, Manitowish, and Turtle Rivers and Squaw Creek also drain about 40% of the county into the Flambeau River, which empties into the Mississippi River. Presque Isle River and Tenderfoot Creek drain about 10% of the county into Lake Superior. (Soil Survey)

The secondary drainage system is poorly defined. The county has an abundance of lakes, many of which drain into the river system through shallow, crooked drainageways. Glacial meltwater was unable to establish a system of deeper channels in the hummocky glacial topography. Many lakes have no outlets. (Soil Survey)

### **LAKES AND STREAMS**

One of the highest concentrations of natural lakes in the world is found in Vilas County along with Oneida County to the south. In Vilas County alone there are over 1,320 lakes (563 with names, and 757 without names). Numerous rivers and streams are also located within Vilas



County. There are 35 cold-water streams and 116 warm water streams.

Eight natural lake reservoirs exist, and are controlled by the Wisconsin Valley Improvement Company (WVIC). These reservoirs are Lac Vieux Desert, Twin Lakes, Buckatabon, Long-on-Deerskin (Long Lake and Sand Lake), Little Deerskin, Lower Nine Mile, Little St. Germain, and Big St. Germain. The total acreage of these reservoirs is 14,872 acres. The WVIC stores water in reservoirs during wet periods, and releases water during dry periods to maintain uniform water flow in the Wisconsin River for hydroelectric purposes.

There are 104 (34 more than in 2009) lake organizations in Vilas County. Ten of the organizations are lake districts, which have taxing authority, and the remaining organizations are voluntary lake associations. The focus of many of the organizations is to provide lake education and information to its members. In addition, many of these groups have initiated comprehensive lake management efforts, volunteer AIS protection efforts, and volunteer water quality monitoring programs. Several organizations are also participating in lake management studies funded through the WDNR Lake Planning Grant program.

*Sparkling Lake, 1971*

In 1971 a Secchi Disk could be seen 30 ½ feet deep in this lake.

Overall, there are no major or widespread water quality problems regarding Vilas County surface waters that can be controlled within Vilas County. Pollution of surface water generally occurs from mercury deposition, the source of which is coal fired power plant emissions and automobile road run-off. Myrtle Lake is impaired due to total phosphorus levels. There is little municipal or industrial waste according to the DNR Water Quality Management Plan for the Headwaters Basin. The streams exhibit good water quality with the majority supporting cold-water fish communities, or warm-water sport fish communities.

Resource Concerns – Shorelands

Vilas County has 1743 miles of inland lake shoreline. At almost 6% of the total miles of inland lake shoreline in Wisconsin that is the most of any county. Due to the high percentage of the land cover of Vilas County being maintained as either managed forest or relatively intact wetland, the greatest direct threat to water quality on County lakes is the development of shorelines by humans. Loss of native vegetation, erosion, historical changes in water levels, and increases in impervious surfaces all negatively affect shoreline condition. The EPA’s National Lakes Assessment concluded that “lakes with poor lakeshore habitat are three times more likely to be in poor overall biological condition than lakes with good quality shorelands.”

Healthy, intact shorelines have a full complement of native vegetation. Native plant buffers absorb runoff before it enters the lake, trapping sediment and pollutants. The buffers also provide wildlife habitat, travel corridors, erosion protection for the lake bank and are the source for future coarse woody habitat in the lake. In fact, 90% of birds, fish, insects, and mammals that are found in and around lakes use the shoreline buffer area for at least one part of their lifecycle.

Many shorelines in Vilas County are unstable due to their past history. During the logging era of

the second half of the 18<sup>th</sup> Century, a number of stream and river channels were dammed up to support the transportation of logs. In some cases water levels were raised a number of feet above their former levels. When the dams were released and the logs allowed to careen downstream, both the flooding and the actual impact of logs on shorelines were damaging to whatever vegetation had not been logged off. As residential and resort interests settled on the lakes in the area, many of the dams were maintained or improved to create flowages between lakes. Shorelines are still adjusting to the new higher lake levels, especially the steeper slopes composed of the fragile sandy soils that are common in Vilas County. The adjustments include slumping and undercutting.

The continued residential development of lakeshores in Vilas County has increased in both pace and intensity over the last 50 years. Additional stressors include the removal of vegetation, the increase in impervious surfaces, and increased wave action from wakes. The result is shorelines that provide little, if any, habitat or buffering capacity and degrading water quality.

Some of the issues associated with developed shorelines are:

- Increased populations of nuisance wildlife:
  - Waterfowl - with the attendant problems such as deposits of feces and being potential reservoirs of swimmer's itch.
  - Overabundance of deer – deer feeding stations attract large herds of deer, which also eat and/or damage native vegetation and landscaping.
  - Simplification of animal communities including birds, small mammals, and amphibians. Sometimes these changes can contribute to cascading changes including increases in disease carrying tick populations
- Increased runoff of nutrients causing the development of algae blooms, some of which can be toxic to humans and pets.
- Loss of habitat due to residents “tidying” up their shorelines. A 1996 study determined that some developed lakes in Vilas County are 200 years behind in the amount of coarse woody habitat (fallen trees) that should be in the lake compared to undeveloped lakes. Similarly, loss of native structure provided by vegetation and fallen trees on shore contributes to a loss of native amphibian, mammalian, and insect species.
- “Hardening” of the shoreline. Shorelines denuded of vegetation experience increased erosion. Boat created waves due to improper use also cause shoreline erosion. To protect their properties from erosion, landowners use artificial products including riprap and sea walls. These structures eliminate critical wildlife habitat and access to and from the lake.
- Impervious surfaces created by roads, roofs, driveways, patios, and other impermeable surfaces, all block the infiltration of water into the ground. Instead the runoff is channeled into the lake carrying both sediments and pollution, again with negative consequences for water quality.
- When water quality diminishes humans are less likely to want to recreate or buy property on a lake with impaired water quality.

## WETLANDS

Wetlands perform many undervalued roles in the proper function of the hydrologic cycle and local ecological systems. In Vilas County the water table is close to the surface, which is evident because almost 1/5 of the county (121,258 acres) is covered with wetlands. In terms of hazard mitigation, they act as water storage devices in times of high water. Like sponges, wetlands are able to absorb excess water and release it back into the watershed slowly, preventing flooding and minimizing flood damage. As more impermeable surfaces are developed, this water runoff storage becomes increasingly important.

Plants and soils in wetlands have the capacity to store and filter pollutants ranging from pesticides to animal wastes. Calm wetland waters, with their flat surface and flow characteristics, allow particles of toxins and nutrients to settle out of the water column. Plants take up certain nutrients from the water. Other substances can be stored or transformed to a less toxic state within wetlands. As a result, the lakes, rivers and streams are cleaner.

Wetlands that filter or store sediments or nutrients for extended periods may undergo fundamental changes. Sediments will eventually fill in wetlands and nutrients will eventually modify the vegetation. Such changes may result in the loss of this function over time. Eradication of wetlands can occur through the use of fill material. This can destroy the hydrological function of the site and open the area to improper development. The WDNR has promulgated minimum standards for managing wetlands.

### Resource Concerns – Wetlands

Vilas County still retains most of its wetlands. There are 121,258 acres of wetlands in Vilas County (18.5% of the land cover). That is more than the acres of lakes, rivers, and streams in the county: 102,276 acres (or 15.6% of the county). Together, water dominated habitats make up 34% of Vilas County.

Much of the economic and environmental health of Vilas County is dependent on the quality of the lakes and streams. In turn their quality depends on the healthy and effective functioning of the wetlands. The environmental benefits of wetlands include:

- Water purification - They trap nutrients, sediments, and pollutants before they enter our waters. (Wetlands can filter as much as 91% of the phosphorus and 86% of the nitrogen that enter the water stream).
- Flood protection – They act like sponges to store and slowly release rain and snow melt.
- Shoreline stabilization - They help buffer water level fluctuations that cause erosion. (Shoreline erosion is a major concern of riparians in Vilas County).

### *Wetlands, 1971*

*“In low, wet areas, extensive marshes and swamps have developed. In the Northern Highland Region, marshes, or muskeg cover about 21 percent of the area in Vilas, Oneida, and adjacent counties. The peat in these bogs is a resource which is not being utilized at present. Cranberry farms may also utilize these areas for production.*

*These marshes also serve a most important function as an area of water reserve, absorbing water during periods of precipitation. The county occupies an important role in the economy of the rest of the state from this viewpoint.”*

- Groundwater recharge and streamflow maintenance – providing both drinking water and the main source of water for some of our lakes and streams.
- Wetlands also provide critical habitat for fish and wildlife, including endangered species. (75% of wildlife species are dependent on wetlands habitats at some point in their lifecycle – including many game species. Most species of freshwater fish are dependent on wetlands for food, breeding habitat or cover).
- Wetlands generate fishing, hunting, and other recreational opportunities such as hiking, bird-watching and photography.

Wetlands contribute both directly and indirectly to the economic base of Vilas County, most especially through the health of the lakes. When wetlands are damaged or destroyed, these ecological functions are lost. To restore or replace these functions is incredibly expensive and not always effective. Per unit area, wetlands contribute more ecological services than their area predicts.

## **D. WATER DESIGNATIONS**

### **OUTSTANDING AND EXCEPTIONAL RESOURCE WATERS**

The DNR has given special designations to water resources throughout the State of Wisconsin that have the highest water quality and fisheries in the State and therefore deserve special protection. Outstanding Resource Waters (ORWs) and Exceptional Resource Waters (ERWs) share many of the same environmental and ecological characteristics. The primary difference between the two is that ORWs typically do not have any direct point sources discharging pollutants directly to the water. In addition, any pollutant load discharged to an ORW must meet background water quality at all times. Exceptions are made for certain types of discharge situations to ERWs to allow pollutant loads that are greater than background water quality when human health would otherwise be compromised.

Outstanding resource waters (ORW) in Vilas County include 13 lakes (12 lakes in 2009); 9 creeks and springs (same in 2009); and 1 river (4 rivers in 2009).

Exceptional resource waters (ERW) in Vilas County include 11 creeks and springs; and 2 rivers. This designation of ERW also includes all Class I trout streams listed in Wisconsin Trout Streams publication 6–3600 (80).

See **Map 3–Designated Waters** for all the ORWs and ERWs countywide.

### **IMPAIRED WATERS – 303(d) WATERS**

Section 303(d) of the federal Clean Water Act requires states to develop a list of impaired waters, commonly referred to as the "303(d) list." A water body is considered impaired if a) the current water quality does not meet the numeric or narrative criteria in a water quality standard or b) the designated use that is described in Wisconsin Administrative Code is not being achieved. A documented methodology is used to articulate the approach used to list waters in Wisconsin. Every two years, states are required to submit a list of impaired waters to EPA for

approval. A current list of impaired waters exists on the DNR website under: 303(d) List of Impaired Waters.

See **Map 3–Designated Waters** for all the *impaired waters* countywide.

In 2014 there were 30 waterbodies in Vilas County on the 303(d) list, which is up from 24 waterbodies in 2008. Most of these waterbodies are listed due to fish consumption advisories for mercury contamination, with “total phosphorus” being the other major reason for water impairment.

### **LAKE CLASSIFICATION**

Surface water quality is significantly affected by activities that occur within a watershed. Irresponsible development along lakes and river shorelines has the potential to negatively impact water quality. For example, residential development that fails to use proper erosion control techniques ultimately increases pollutant runoff. Enlarged impervious surfaces, poorly designed septic systems, overuse of lawn fertilizers (especially containing phosphorus), unfiltered stormwater runoff, and removal of natural shoreline vegetation that exposes soil are all potential contributors of soil sediment, nutrients, or other pollutants into surface waters.

Excessive shoreline development patterns can lead to changes in a lake’s ecosystem on many levels and can severely impact overall water quality. Water clarity declines as a result of increased soil sediment runoff and nutrient loads from nitrogen and phosphorus can cause excessive aquatic macrophyte and algae growth. Soil sediment runoff can cover up and eliminate critical areas such as fish spawning habitat in shallow water.

The *Vilas County Lake and River Classification System (Map 8)* was created in 1999 by Vilas County Zoning and Planning as a prevention measure to address existing and future problems with lakeshore development pressures. The classification system established varying degrees of protection in permitting and mitigation standards to water bodies based upon their sensitivity level and existing development. The overall goal of the lake classification system is to guide responsible development based on a specific water body’s resilience to accommodate that development and still remain a healthy and viable aquatic ecosystem.

Lake or river classification is a management tool to organize water bodies into similar groups and tailor management approaches to satisfy the unique sensitivity levels of lakes and rivers within each class. The lake and river classification process gathered data about lakes’ and rivers’ physical features (such as type, size, watershed area, sensitivity to pollution, and other development impacts, etc.) and characteristics relating to the 1999 pattern and intensity of development around the water body. Waters with a similar capacity to assimilate pollutants, support development, specific recreational uses or other characteristics are then placed into distinct management classes.

## **E. AQUATIC INVASIVE SPECIES**

The aquatic invasive species program in Vilas County has evolved since 2004 to concentrate efforts in three areas:

1. Public awareness and prevention
2. Early detection presence/absence monitoring, particularly for species that can be managed.
3. Effective management of manageable species (plants)

### Public awareness and prevention:

With the majority of area lakes not yet populated with any AIS, the objective of awareness and prevention is to help boaters understand how to prevent the spread of harmful plants and animals. General public awareness of AIS laws intended to promote good boater hygiene practices provides a foundation for prevention, but some aspects of the laws are not understood by all boats resulting in less than optimal compliance. If boaters fail to understand that some AIS are small bodied microorganisms capable of being moved in on-board water, such as the spiny water flea, there will be a reluctance to properly drain all water from boats when moving equipment between lakes.

The perception that “weeds are the only species we need be concerned about” ended in late 2013 when an abundant population of spiny water fleas was found in Star Lake in central Vilas County. Previously believed to be in only Stormy Lake, a seepage lake with relatively little public access and therefore rather minimal risk of outward movement of the invader, the spiny water flea was regarded with lesser concern than invasive plants. Finding this species in Star Lake, one of three interconnected drainage lakes, all with heavily used public boat landings, was a wake-up call that transporting water between lakes in live wells, bilges and bait containers could easily result in the spread of harmful small bodied microorganisms.

In response to this new awareness, the Clean Boats, Clean Waters (CBCW) program was revised prior to the opening of the 2014 boating season. Emphasis of boater education switched from simple awareness that AIS laws exist and are being enforced to explaining the reasons for the laws. Using the spiny water flea as an example of how moving seemingly harmless water between lakes can have potentially devastating results to fish populations, it is believed that boaters will more readily comply with a law that may not have been understood previously.

The CBCW program is regarded by many local lake organizations as their best defense against spreading AIS. While originally intended to be a program of limited duration and therefore sustainable by volunteers for as long as needed, it is now regarded as necessary for well into the future. The WDNR CBCW grant program was simplified in 2012 making funding easy to obtain for hiring seasonal employees to interact with boaters at public landings. It is estimated that approximately 10,000 hours of volunteer and paid CBCW services will be accomplished in Vilas County during the 2014 boating season. More than 200 paid and volunteer individuals were trained by the Land & Water Conservation Department to understand the revised CBCW protocol before interacting with boaters.

### Early detection presence/absence monitoring:

Since it is only plant species that can be managed effectively and many of the animal species require special equipment and training to detect, citizen monitoring in Vilas County for presence/absence of AIS is predominantly for Eurasian watermilfoil and Curly-leaf pondweed. Lake organizations have come to understand that early detection of these plants, before their populations are well established, typically results in more effective and lower cost management efforts. Seasonal workshops to help citizen monitors detect and report suspicious plants are an important aspect of effective monitoring.

### Effective management of manageable species:

Northern Region lakes have provided good opportunities to scientifically determine which methods for managing populations Eurasian watermilfoil and curly-leaf pondweed are effective and an understanding of why. Reduced cost and better control have resulted from close working relationships between local lake organizations, lake management consultants, qualified pesticide applicators and divers, the WDNR AIS grant program and local WDNR lake specialist staff at the Rhinelander and Woodruff offices and the Vilas County Land & Water Conservation Department.

### Resource Concerns – AIS

Three categories of aquatic invasive species form the foundation of the Vilas County AIS initiative:

1. Eurasian watermilfoil and curly-leaf pondweed are submersed plants known to exist in approximately 35 Vilas County lakes. More than two million dollars have been spent over the past decade managing these two plant species in those lakes. While the effect of these plants on aquatic ecosystems varies from lake to lake, the fear of extreme harm, even to the point of waterfront property value reduction, is the foundation for AIS prevention, early detection monitoring and rapid response efforts. Climate change will likely enable additional aquatic species that have not yet spread into northern Wisconsin to eventually thrive here.
2. Small bodied non-native microorganisms such as the spiny water flea and the veliger life stage of the zebra mussel are of rapidly growing local concern. The water chemistry of most Vilas County lakes lacks sufficient calcium to support zebra mussel shell production thereby limiting the potential for this species to become established. However, the spiny water flea and its potential to upset the food chain from the bottom up, thus threatening havoc to fish populations, is helping boaters understand why transporting water in live wells, bait containers and boat bilges is prohibited. No methods are known for managing most small bodied invasive aquatic microorganisms. Prevention is of paramount importance.
3. The harmful effects of shoreline/wetland invasive plant species are also becoming better understood by waterfront property owners. Whether plants such as purple loosestrife, yellow iris, garden loosestrife or Japanese knotweed should be regarded as aquatic or terrestrial species is debatable. But because most grow primarily above ordinary high water levels along shorelines and in wetlands, often on private lands, responsibility for

managing these plants falls to landowners as opposed to the management of truly aquatic species who live entirely in state owned waters over state owned lake beds.

## **F. SUSCEPTIBILITY OF GROUNDWATER TO CONTAMINANTS**

The groundwater quality in Vilas County is generally good, however the County is susceptible to groundwater contamination in most areas due to the predominance of sandy soils and shallow depth to groundwater.

“Susceptibility of Groundwater to Pollutants” is defined here as the ease with which a contaminant can be transported from the land surface to the top of the groundwater called the “water table”. Many materials that overlie the groundwater offer good protection from contaminants that might be transported by infiltrating waters. The amount of protection offered by the overlying material varies, however, depending on the materials. Thus, in some areas, the overlying soil and bedrock materials allow contaminants to reach the groundwater more easily than in other areas of the state.

In order to identify areas sensitive to contamination, the Wisconsin Department of Natural Resources, in cooperation with the University of Wisconsin-Extension, Wisconsin Geological and Natural History Survey and the USGS, have evaluated the physical resource characteristics that influence this sensitivity.

Five physical resource characteristics were identified as important in determining how easily a contaminant can be carried through overlying materials to the groundwater.

These characteristics are:

1. depth to bedrock,
2. type of bedrock,
3. soil characteristics,
4. depth to water table; and
5. characteristics of surficial deposits.

The resulting map shows that most of Vilas County is "more susceptible" to groundwater contamination, but the northern part of Lac du Flambeau and the southern part of Manitowish Waters is "less susceptible" based upon soil characteristics, surficial deposits, depth to water table, depth to bedrock, and type of bedrock. See **Map 5–Susceptibility to Groundwater Contamination**.

Many land use activities have the potential to impact the quality of groundwater. A landfill may leach contaminants into the ground that end up contaminating groundwater. Gasoline may leak from an underground storage tank into groundwater. Fertilizers and pesticides can seep into the ground from application on farm fields, golf courses, or lawns. Leaking fluids from cars in junkyards, intentional dumping or accidental spills of paint, used motor oil, or other chemicals on the ground can result in contaminated groundwater.



### Resource Concerns – Groundwater Contamination

Groundwater is a vital natural resource here in Vilas County because most residents and visitors here depend on clean groundwater for their main drinking water supply. It is also a vulnerable resource because it has the potential to be depleted or degraded by human activities.

The following are several reasons that groundwater has been identified as a priority concern:

- 1) Susceptibility to groundwater contamination is naturally high in Vilas County because of our mostly sandy soils, and the relatively shallow depth to water;
- 2) Certain land use practices can result in contamination to groundwater by elevating concentrations of bacteria, nutrients, pesticides, or a host of other watershed pollutants;
- 3) Nitrates or other substances naturally found in groundwater can be harmful to humans at certain elevated levels; and
- 4) Unused wells that have not been abandoned properly.

Measures to protect groundwater resources in Vilas County should be enacted before degradation occurs because once contaminated, groundwater cleanup and remediation can prove to be very expensive. In order to protect this vital resource, it must be periodically assessed and managed properly.

Attention to groundwater will be incorporated into future work efforts of county staff. Since the county has such sandy soils, infiltration of contaminated water can occur very quickly especially in shallow groundwater areas. Based on the contaminant in question, a drinking water supply may become unsuitable for human consumption. Grant monies will assist the county in hosting a ten year follow-up assessment of the groundwater, similar to the one completed in 2011. Comparisons of the groundwater quality will be made at that time, in addition to educating the public through workshops where they will receive their test results. Staff will also begin to address unused wells and assist the public to abandon them properly by utilizing our cost share dollars.

### **DRINKING WATER TEST RESULTS**

Safe drinking water is something that many people commonly take for granted. Most residents in Vilas County draw their water supply from private wells. In the past 5 years (2009-2014), 459 households in Vilas County tested their well water through the UW-Stevens Point Environmental Task Force Lab. The following summary for bacteria, nitrate, and chloride levels are based on data collected from 2009 to 2014. The previous 5-year summary covered the period from 2004 through 2008, in which 520 households submitted samples for one or more parameters. Please note that the following information represents averages for samples received in a 5 year period. Because wells sampled from 2004 through 2008 were in many cases different wells than those sampled from 2009 through 2014, the data does not necessarily reflect trends in groundwater quality.

#### Bacteria

From 2004 through 2008, 6% of the water sampled had evidence of coliform bacteria. Between 2009 and 2014, 13% of the water sampled had evidence of coliform bacteria. Microorganisms of coliform bacteria are usually found in surface water, soil, and in the feces of humans and animals. It usually does not cause disease, however, its presence indicates that wastes may be contaminating the water, and pathogenic (disease causing) organisms could be present. If human

or animal wastes are contaminating the water, then gastrointestinal diseases or hepatitis may result.

### Nitrates

From 2004 through 2008, 14% of the water samples had nitrate levels above the naturally occurring range, and less than 1% showed levels above the Federal Drinking Water Standard. Between 2008 and 2014, 15% of the water samples had nitrate levels above the naturally occurring range, and just under 3% of samples showed levels above the Federal Drinking Water Standard. Levels that are above the naturally occurring level usually indicate contamination from fertilizer, septic system effluent, animal wastes, and landfills. Vilas County appears significantly better than the statewide average, it is estimated that 9% of private wells statewide are above the 10mg/L drinking water standard.

- No municipal water systems in Vilas County have spent money to reduce nitrate levels. (V.C. 2014)

### Chloride

From 2004 through 2008, 22% of the water sampled had chloride levels above the naturally occurring range. Between 2009 and 2014, just under 22% of the water sampled had chloride levels above the naturally occurring level. There is no health standard for this contaminant. Chloride at levels greater than 10 mg/L (the natural level) usually indicate contamination by onsite wastewater treatment systems (including water softener regeneration), road salt, fertilizer, animal waste, or other wastes. Chloride is not toxic in concentrations typically found in groundwater, but some people can detect a salty taste at 250 mg/L (less than 1% samples tested above 200 mg/L). Levels of chloride that are above what is typical under natural conditions indicate that groundwater is being affected by human activities, and extra care should be taken to ensure that land use activities do not further degrade water quality.

## **MUNICIPAL WELLHEAD PROTECTION PLANS AND ORDINANCES**

- 4 of 5 municipal water systems serving Vilas County have a wellhead protection plan: Lac du Flambeau, Lakeland, Land O' Lakes, and Phelps. (V.C. 2014)
- 1 of 5 municipal water systems serving Vilas County have a wellhead protection ordinance: Lac du Flambeau. (V.C. 2014)

Wellhead protection plans are developed to achieve groundwater pollution prevention measures within public water supply wellhead areas. A wellhead protection plan uses public involvement to delineate the wellhead protection area, inventory potential groundwater contamination sources, and manage the wellhead protection area. All new municipal wells are required to have a wellhead protection plan. A wellhead protection ordinance is a zoning ordinance that implements the wellhead protection plan by controlling land uses in the wellhead protection area.

Of those municipal water systems that have wellhead protection (WHP) plans, some have a WHP plan for all of their wells, while others only have a plan for one or some of their wells. Similarly, of those municipal water systems that have WHP ordinances, some ordinances apply to all of their wells and others just one or some of their wells.

## LANDFILLS

In Vilas County there are 55 known landfills, 15 of which are privately owned. Only the Highway G landfill is active. All the known landfills are located on the **Map 6–Existing Land Use**. Landfills shown on the map do not mean that environmental contamination has occurred, is occurring, or will occur in the future. WDNR requires a 1,200-foot buffer away from landfills where no wells are allowed.

## CONTAMINATED SITES

Vilas County sponsors hazardous waste collections when grant money is available. Hazardous waste collection is also available at the Oneida County Landfill near Rhinelander. (V.C. 2014)

The WDNR Internet database known as the **Bureau of Remediation and Redevelopment Tracking System (BRRTS)** provides information about contaminated properties and other activities related to the investigation and cleanup of contaminated soil or groundwater in Wisconsin.

**ERP** sites are sites other than LUSTs that have contaminated soil and/or groundwater.

**AC** sites had abandoned containers on them.

**LUST** site has contaminated soil and/or groundwater with petroleum, which includes toxic and cancer causing substances.

**Spills** are a discharge of a hazardous substance that may adversely impact, or threaten to impact public health, welfare or the environment.

The BRRTS listing showed 32 *closed* ERPs, 11 *closed* ACs, 163 *closed* LUSTs, and 106 *closed* Spills. A "*closed*" site means that the DNR has approved the final clean-up of that site, and now it is available for re-use.

The BRRTS listing showed 19 *open* ERPs (up from 9 listed in 2009), no *open* ACs, 7 *open* LUSTs, and 1 *open* Spills. Sites listed as "*open*" still need remediation before being reused.

## G. OVERALL RESOURCE CONCERNS

### Resource Concern – Soil Erosion

Soil erosion is a priority concern in Vilas County because of the water quality damage that soil sedimentation and nutrients can cause. Vilas County has loose sandy soil as a prominent soil type, so the likelihood of soil movement is high if the ground is left uncovered. At the molecular level, soil particles are covered in nutrients and pollutants. Once deposited into a waterway, nutrients not only increase algae growth, but soil may cover up important habitat in that ecosystem – fish spawning habitat. Fishing in Vilas County is a vital part of our tourism economy! Fishery research conducted by Dr. Gregory Sass from the Escanaba Lake research station has actually shown noticeable declines in the walleye populations' natural ability to reproduce in northern lakes. There is only a central section of Vilas County that this is not the case. Sass thinks that the decline may be the result of sedimentation from development activities within watersheds and increasing levels of shoreline bank erosion caused from high energy wave action.

Keeping native vegetation on shorelines at a minimum depth of 35 feet from the bank and fixing problem areas are very important to the health of our abundant water resources. County Conservation personnel will continue to educate landowners and visitors alike to reduce soil disturbance and minimize erosion potential on their land. Practices offered through the conservation cost share program to combat soil erosion will continue to be offered to private landowners. The County will respond to problem areas as necessary in consultation with partners and will conduct watershed health studies to determine areas within the county that are most likely to experience soil erosion. During the studies, the STEPL model will be used to estimate nutrient load reductions in watersheds identified as high priority.

### **Resource Concern – Non-point Source Pollution and Phosphorus Loading**

Non-point source (NPS) pollution comes from many different sources within a given watershed. Rainfall or snowmelt is the cause of the pollution because as the water runs off (and through) the landscape, it picks up and carries with it pollutants, which finally get deposited into lakes, rivers, wetlands, and even groundwater.

Runoff from nonpoint sources of pollution, such as, phosphorus will begin to cause eutrophication of surface waters by increased algae growth, macrophyte growth, and oxygen depletion of the water. Water runoff that contains soil sediment can also damage important fishery habitats by covering important spawning areas for certain species of fish.

The EPA lists examples of non-point sources of pollution as:

- Oil, grease and toxic chemicals from urban runoff and energy production;
- Fertilizers, herbicides and insecticides from agricultural lands and residential areas;
- Sediment from improperly managed construction sites, crop and forest lands, and eroding stream banks;
- Salt from irrigation practices and acid drainage from abandoned mines;
- Bacteria and nutrients from livestock, pet wastes and faulty septic systems; and
- Atmospheric deposition.

To combat non-point source pollution in Vilas County, county staff will continue to offer private landowners' partial reimbursement of practices they install on their land that combat non-point source pollution by reducing water volume and slowing down flow. We will support the Zoning Department septic system maintenance program and encourage landowners to use incentive programs that NRCS offers for water quality protection. Education will also take place to various groups about how they can be good conservation stewards and how to use best management practices on their land.

### **Resource Concerns – Water Levels affect Water Quality**

Vilas County depends on clean and healthy lakes, streams, and wetlands to sustain our tourism based recreation economy. High quality waters also enable residents and visitors alike to enjoy the peace, solitude, and sense of well being that healthy environments can offer.

Although annual fluctuations of water level are a natural and on-going process for water

resources, Vilas County has experienced a long-term trend toward lower lake levels in recent years. In fact, according to John Lenters, Associate Professor at the University of Nebraska – Lincoln, lake water levels in northern Wisconsin had dropped an average of 42 inches from 1997-2007. This drop provided dramatic visual proof and sparked real public concerns about Vilas County lakes. Lenters thinks that although there are likely many contributing factors to the lowered levels, significant influences are precipitation, water temperatures, and evaporation.

The long-term lowering of annual average precipitation in Vilas County resulted in lowered water levels on the lakes. Many lakes in this area are “seepage” lakes, meaning that they rely on precipitation and groundwater sources to sustain levels. Lowered precipitation over several years disabled the recharge rates to groundwater supplies, thus lake levels remained lowered each year. Once lowered, lake temperatures rose, thus, increasing the evaporation rates even more than normal. The good news is that in current years, levels are back on the rise.

Vilas County believes that monitoring of water levels is more important now than ever, especially with the variability in climate we are experiencing in recent years. Long-term data collection on many Wisconsin water bodies is necessary to closely monitor variability in average lake levels. The Land & Water Department will take an active role and assist in the development of a state protocol to consistently monitor lake levels through the Citizen Lake Monitoring Network.

Sustaining high quality water resources has always been and remains a resource priority and concern in Vilas County. Human activities that occur within watersheds and on riparian shores have a direct affect on the quality of our waters. For example, consider nitrogen and phosphorus fertilizers that are applied to crops and lawns. These nutrients easily dissolve and runoff into rain storms or in snowmelt, entering lakes or streams. Excess algae and plant growth can result, which leads to low oxygen levels and potential fish kills.

Vilas County Land and Water Conservation will pay close attention to water quality in our surface waters, and there are numerous activities outlined in the work plan that directly or indirectly affect the quality of the county’s water resources:

- County staff will educate the public through various workshops and presentations that will focus on sustaining high water quality.
- Water quality monitor volunteers participating in the Citizen Lake Monitoring Network will continue to be trained by county staff.
- Wetlands education will be offered to the public and to local decision makers.
- Private landowners with soil erosion concerns can contact us to design and cost-share BMP’s on their lands.
- Invasive species and the boat inspection program will remain a priority in the county work plan.
- Lake comprehensive planning and protection projects will be supported.
- The STEPL model will be used to estimate nutrient reductions within most county watersheds.
- Areas within the county that are most vulnerable to water quality degradation will be identified and prioritized.

### **Resource Concerns – Road Salt**

In recent years there has been a growing concern about the affects of road salt on habitats and organisms in across the US. Research is just starting but certain facts have been determined about how road salt and de-icers leave the pavement and what happens. The larger movement is runoff from the roadbed. The chemicals then either infiltrate through the soil and into ground water or move directly into surface water. Salt can travel directly through soils up to 200 yards from the edge of roads and stays in the soil and ground water for decades, because it accumulates rather than flushing through the hydrologic system. Increases in sodium and chloride have also been shown to increase mobilization of heavy metals in the soil along major highways. In areas associated with heavily salted roads or near salt storage areas, ground water contamination can negatively affect the taste of well water.

In lakes and streams, salty water is more dense so it sinks in deep pockets. This water is less able to mix, so the cold water becomes de-oxygenated, reducing habitat for fish and other aquatic organisms that are dependent on these colder waters.

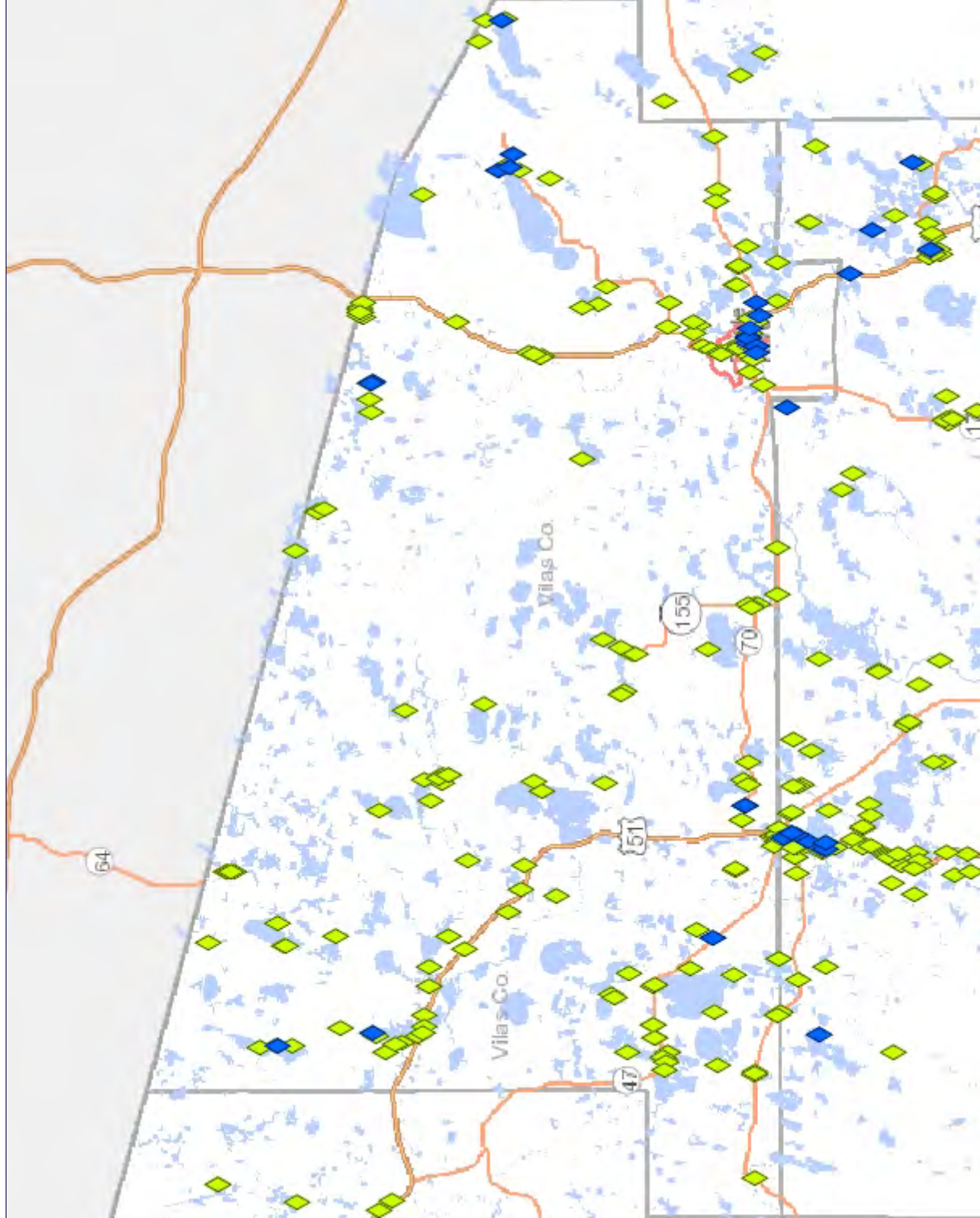
At moderate levels, road deicing agents that enter wetlands can affect amphibians, both directly in terms of health and reproduction, and indirectly by altering food web interactions. Plants are also negatively affected, allowing aggressive non-native species to invade. These changes diminish both the quality of wetlands as habitat for native species and the function of the wetland to protect water quality.

Road salt and de-icing agents also become airborne and directly affect plants along roadsides. The chemicals land on all plant parts, causing damage and weakening the plant, so it is less able to withstand harsh winter conditions. These dying plants are also more susceptible to other plant diseases, insects and pathogens. As plants die and conditions are unfavorable to native species, opportunities for salt tolerant invasive species open up.

Some communities are assessing the types, quantities, and methods of applying the de-icing agents they use to develop alternatives that achieve the same safety results, but also have few negative environmental consequences.



# BRRTS Map of Contaminated Sites Vilas County



## Legend

- Open Site (ongoing cleanup)
- Closed Site (completed cleanup)
- Cities
- Villages

## Notes

DISCLAIMER: The information shown on these maps has been obtained from various sources, and are of varying age, reliability and resolution. These maps are not intended to be used for navigation, nor are these maps an authoritative source of information about legal land ownership or public access. No warranty, expressed or implied, is made regarding accuracy, applicability for a particular use, completeness, or legality of the information depicted on this map. For more information, see the DNR Legal Notices web page: <http://dnr.wi.gov/org/legal/>

Note: Not all sites are mapped.

13.6

6.78

13.6 Miles

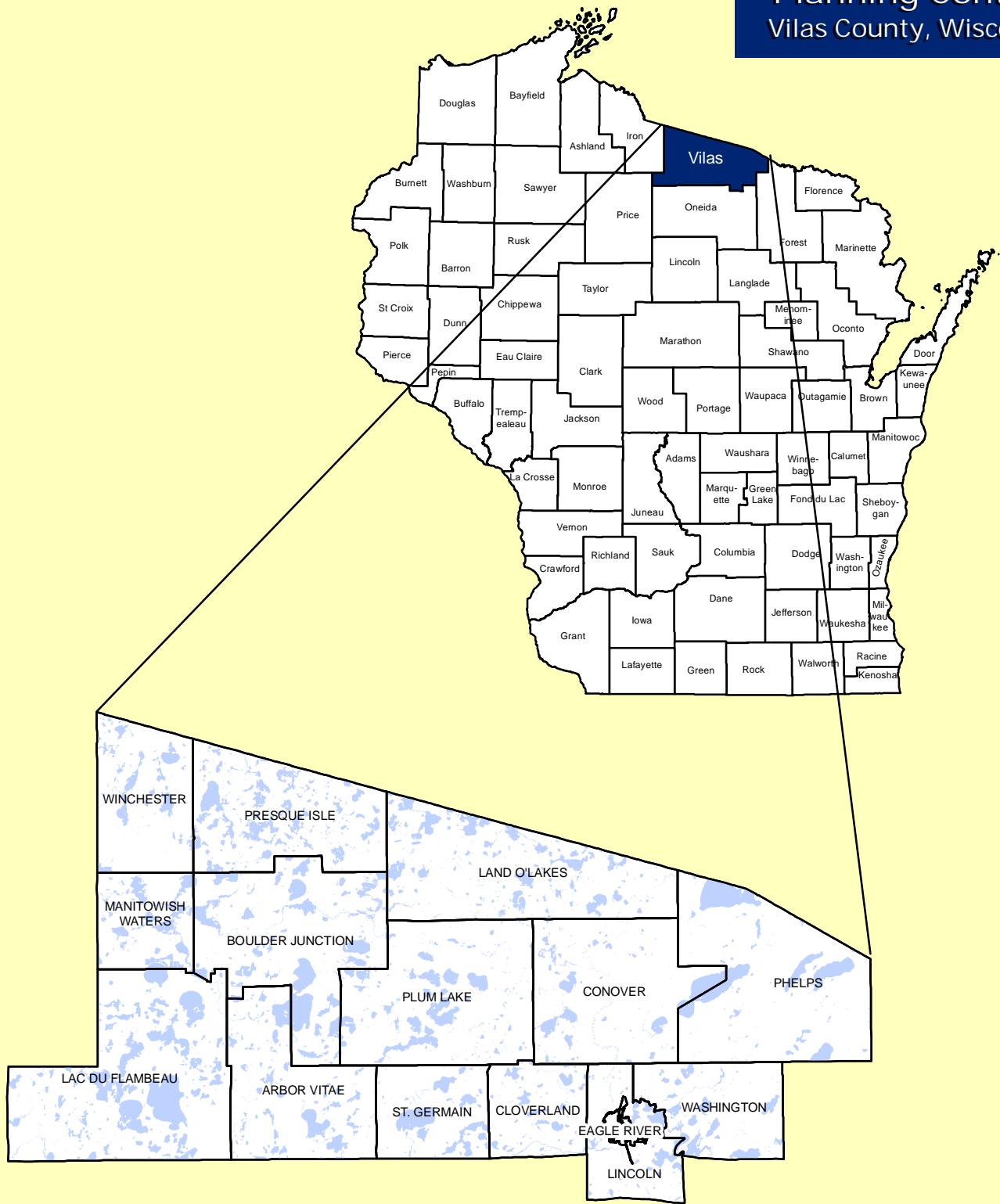


1: 429,444

NAD\_1983\_HARN\_Wisconsin\_TM

© Latitude Geographics Group Ltd.

# Map 1 Planning Context Vilas County, Wisconsin



Source: WI DNR, NCWRPC

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.

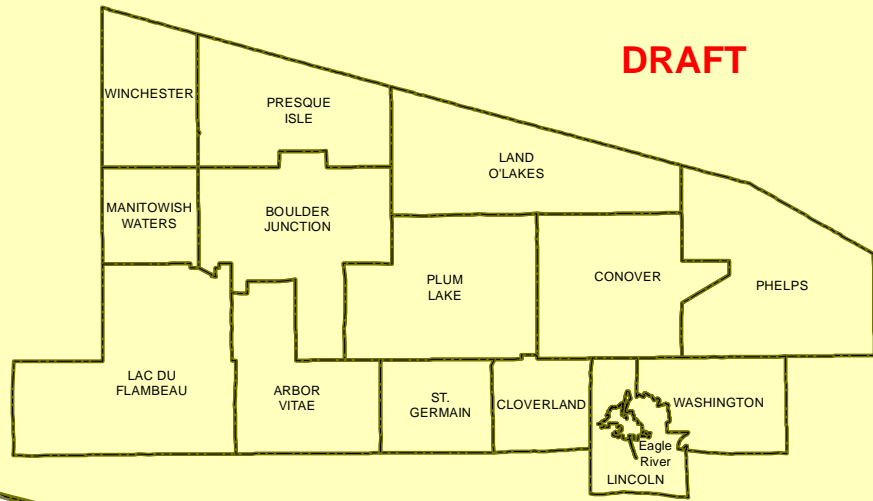
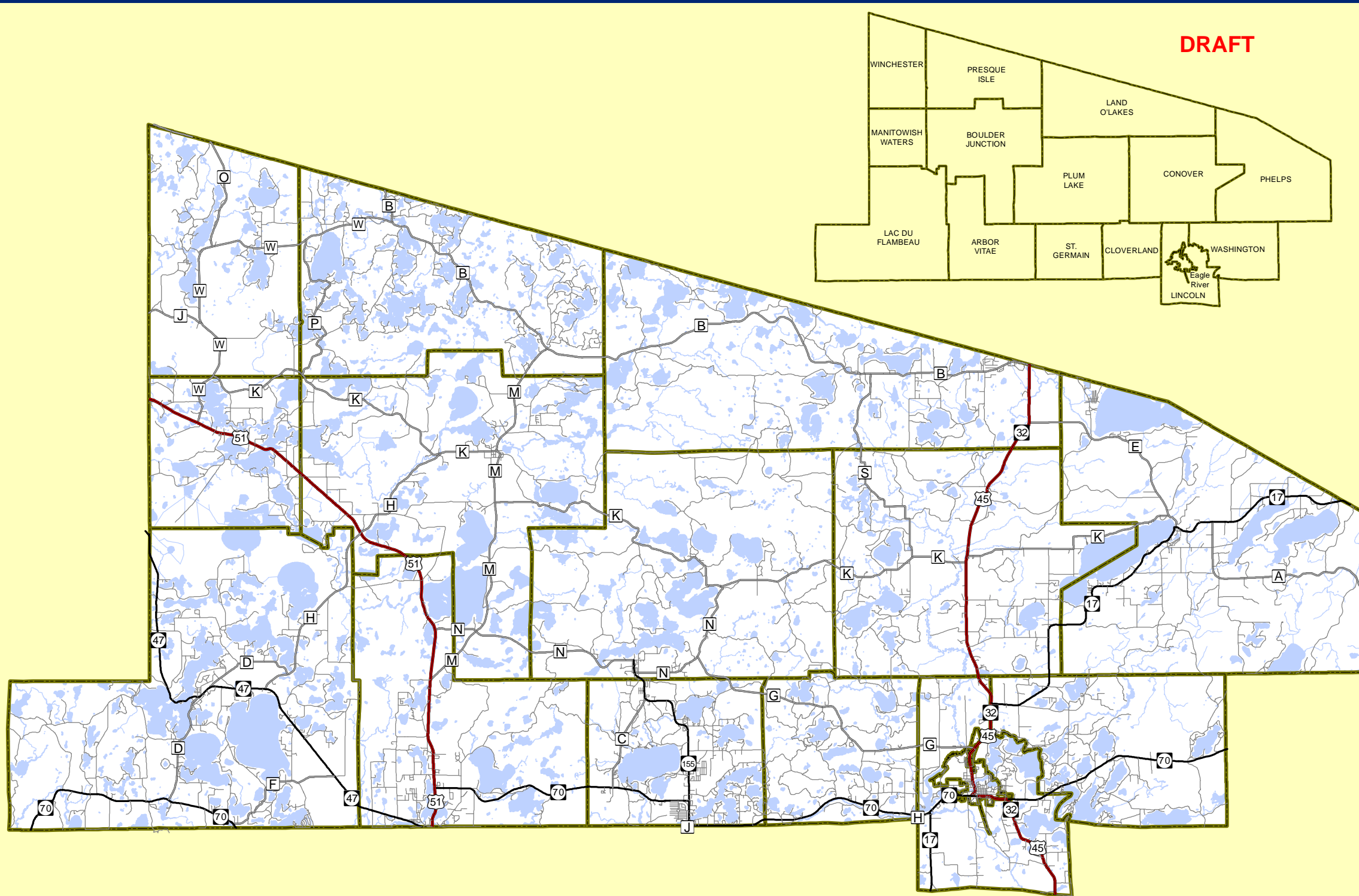


Prepared By:

**North Central  
Wisconsin Regional  
Planning Commission**

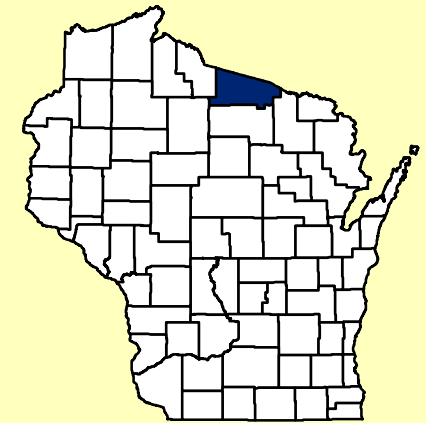
210 McClellan St., Suite 210, Wausau, WI 54403  
715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org





**DRAFT**

**DRAFT**

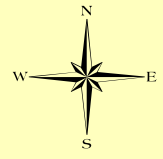
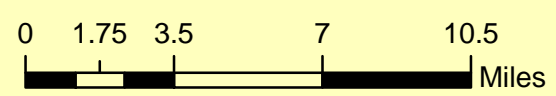


**Legend**

- Minor Civil Divisions
- US Highway
- State Highway
- County Highways
- Local Roads
- Water

Source: WI DNR, NCWRPC, Vilas County Mapping Dept

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.

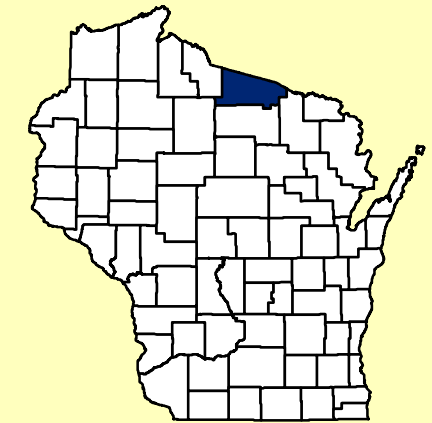
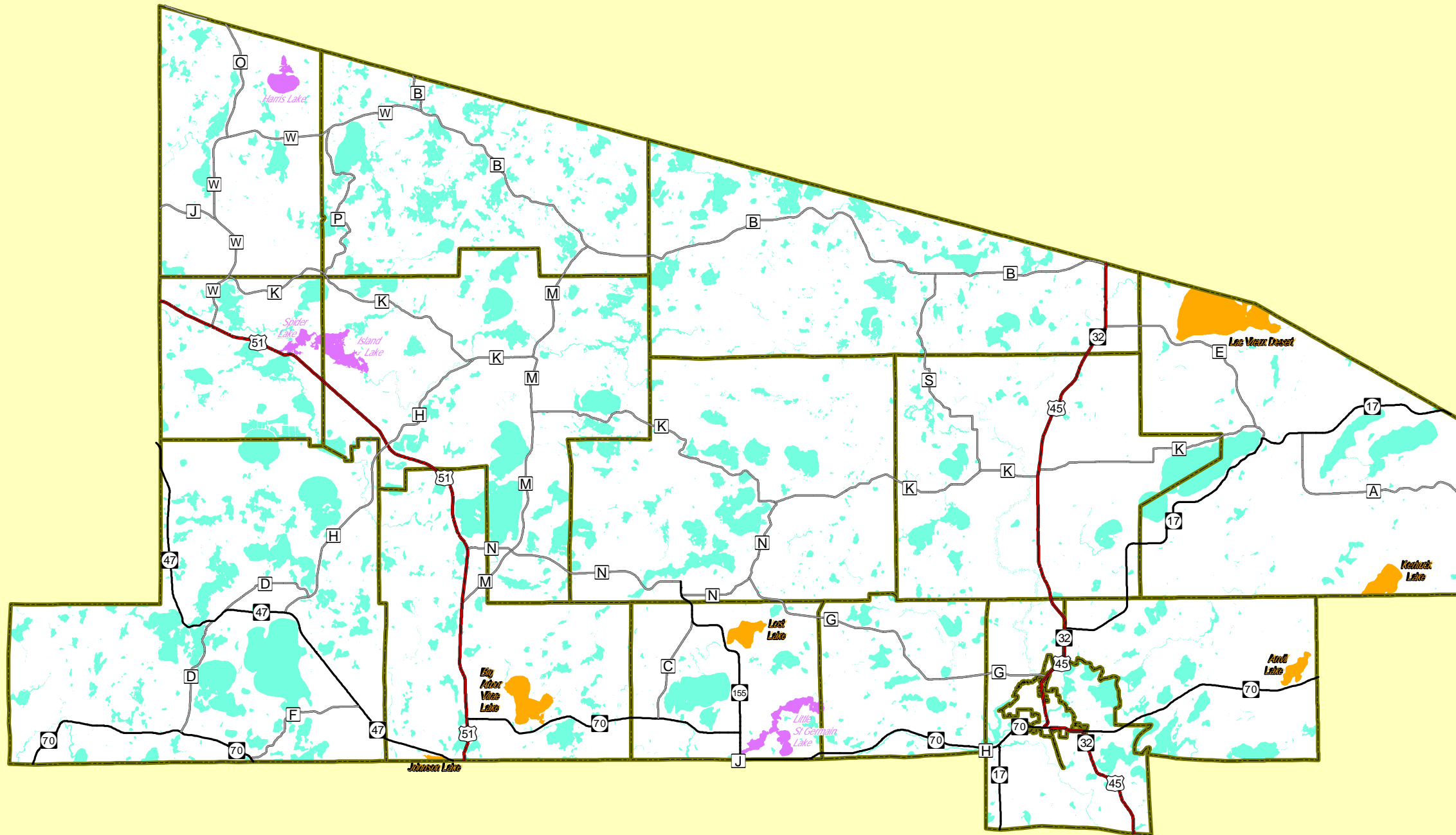


Prepared By:  
**North Central Wisconsin Regional Planning Commission**








210 McClellan St., Suite 210, Wausau, WI 54403  
 715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org

DRAFT

DRAFT

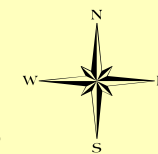
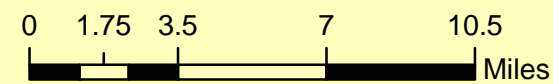


Legend

-  US Highway
-  State Highway
-  County Highways
-  Minor Civil Divisions
-  Water
- Curly-Leaf Pondweed**
-  Active/Management Ongoing (A/O)
-  Watch/Action Pending (W/P)

Source: WI DNR, NCWRPC, Vilas County Mapping Dept  
Vilas Co. Land & Water Conservation Dept.

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.

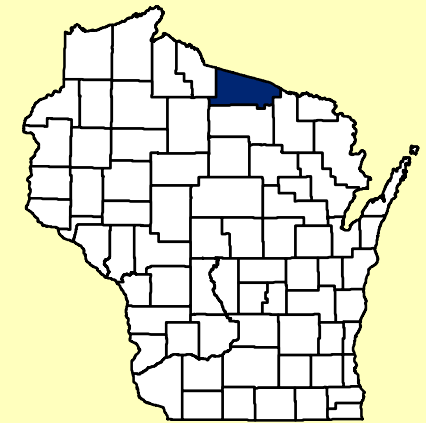
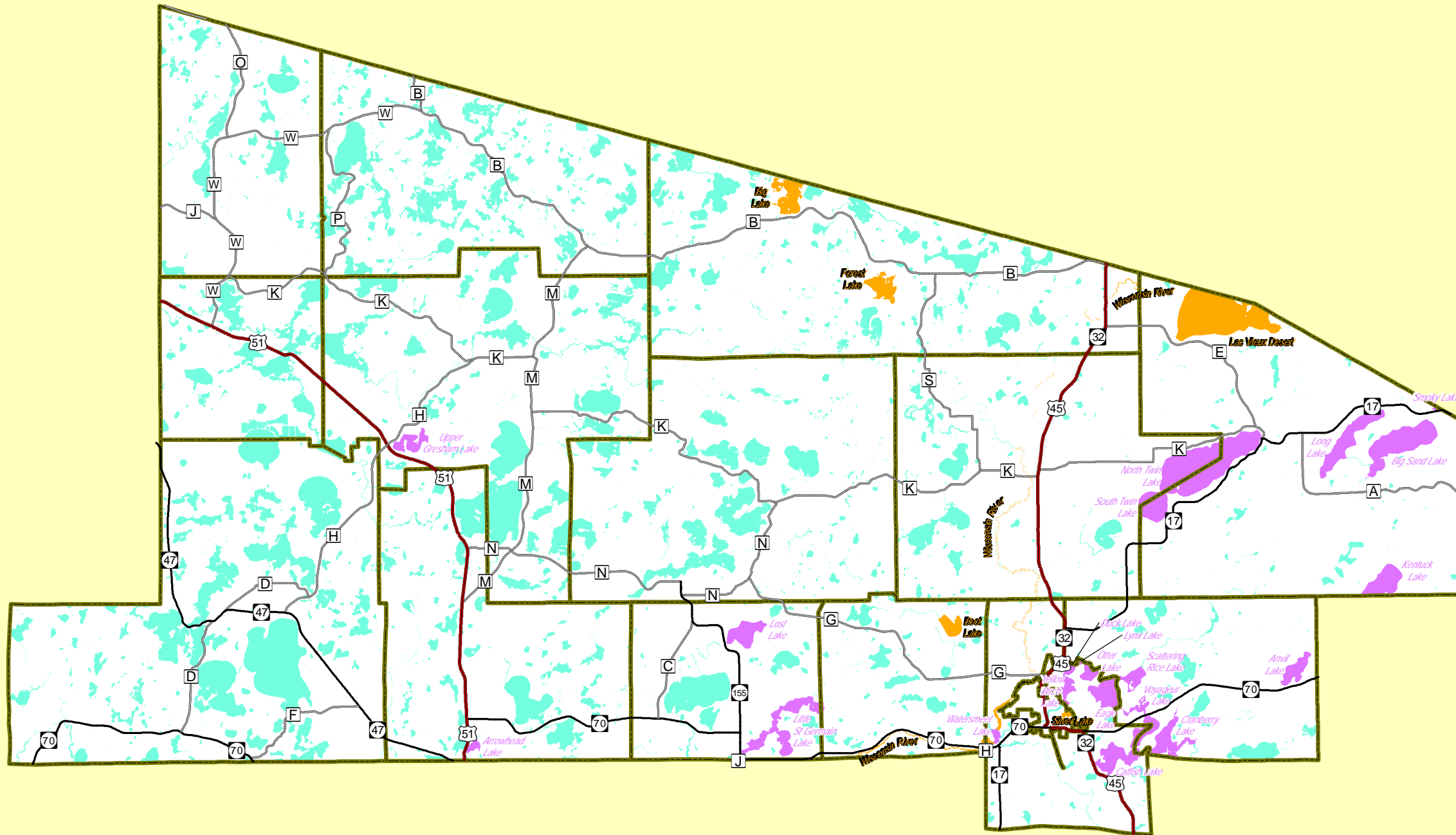


Prepared By:  
**North Central  
Wisconsin Regional  
Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org

DRAFT

DRAFT

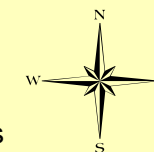
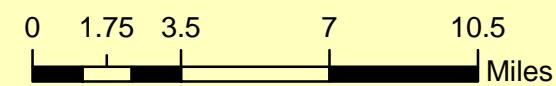


Legend

- US Highway
- State Highway
- County Highways
- Minor Civil Divisions
- Water
- Eurasian Watermilfoil**
- Active/Management Ongoing (A/O)
- Watch/Action Pending (W/P)

Source: WI DNR, NCWRPC, Vilas County Mapping Dept  
Vilas Co. Land & Water Conservation Dept.

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.

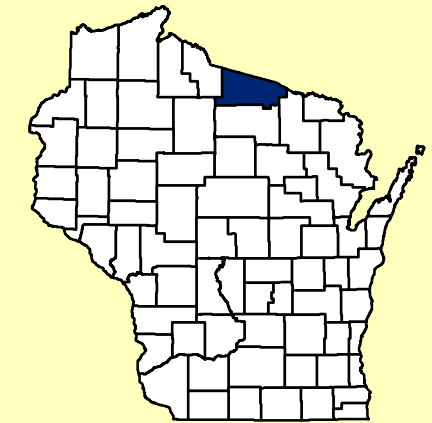
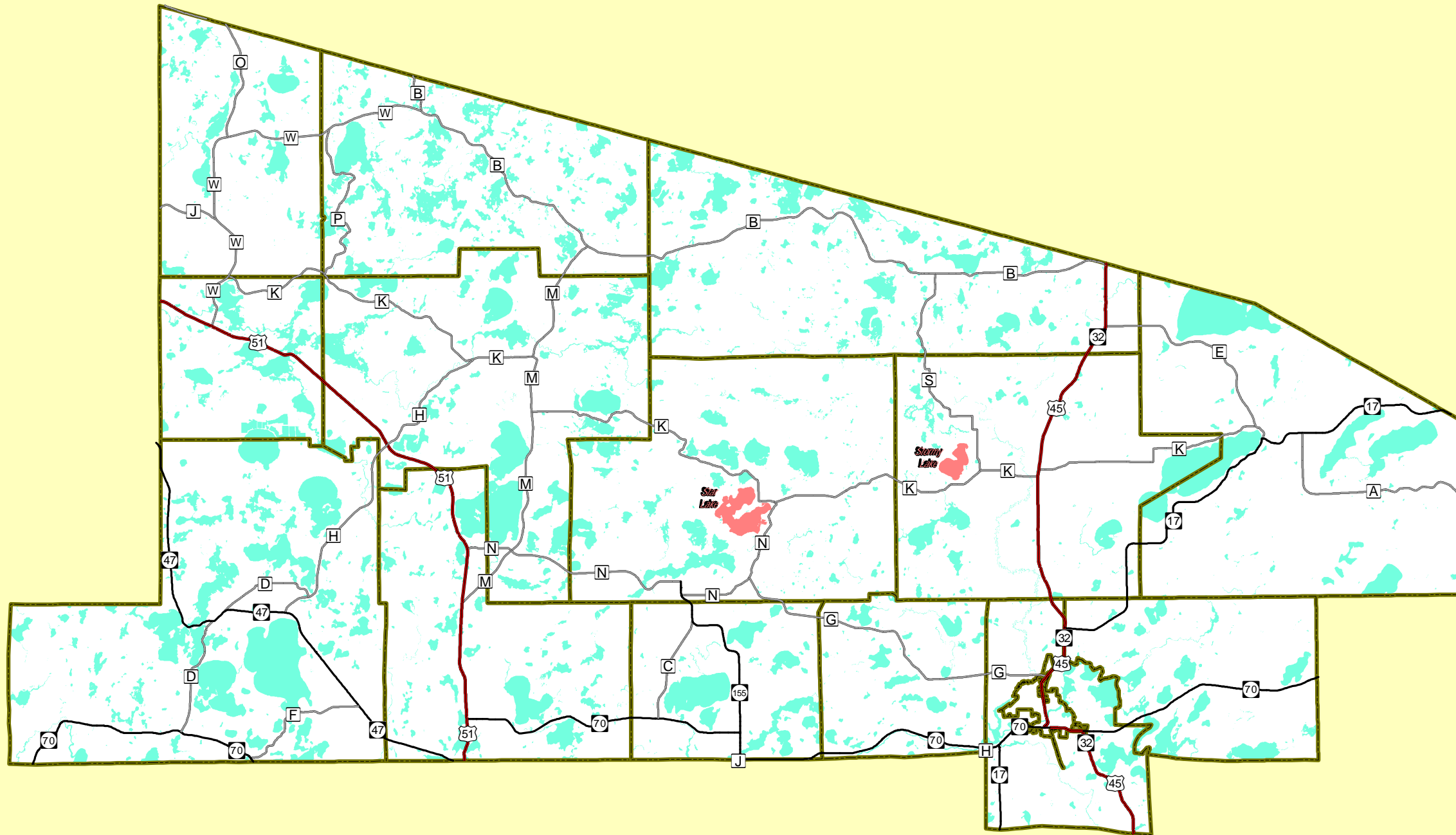


Prepared By:  
**North Central  
Wisconsin Regional  
Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org

DRAFT

DRAFT

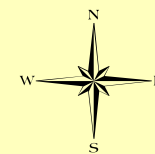
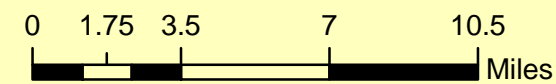


Legend

- US Highway
- State Highway
- County Highways
- Minor Civil Divisions
- Water
- Spiny Water Flea**
- No Known Management Options (NA)

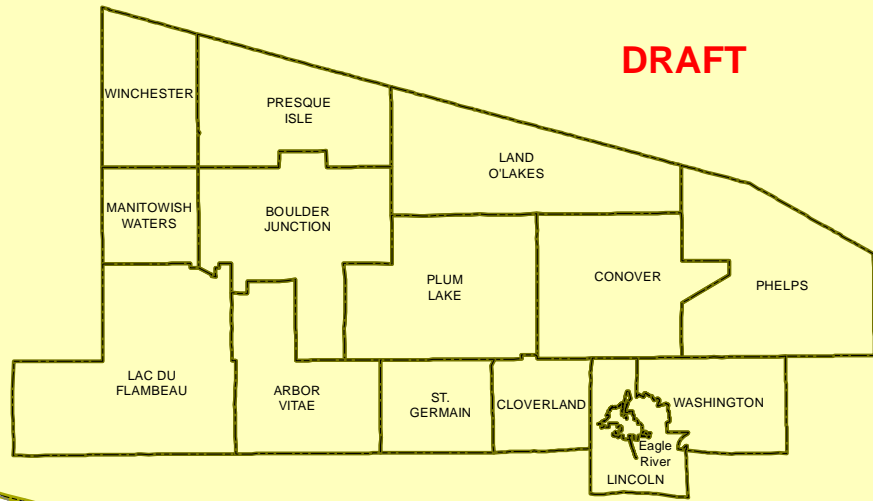
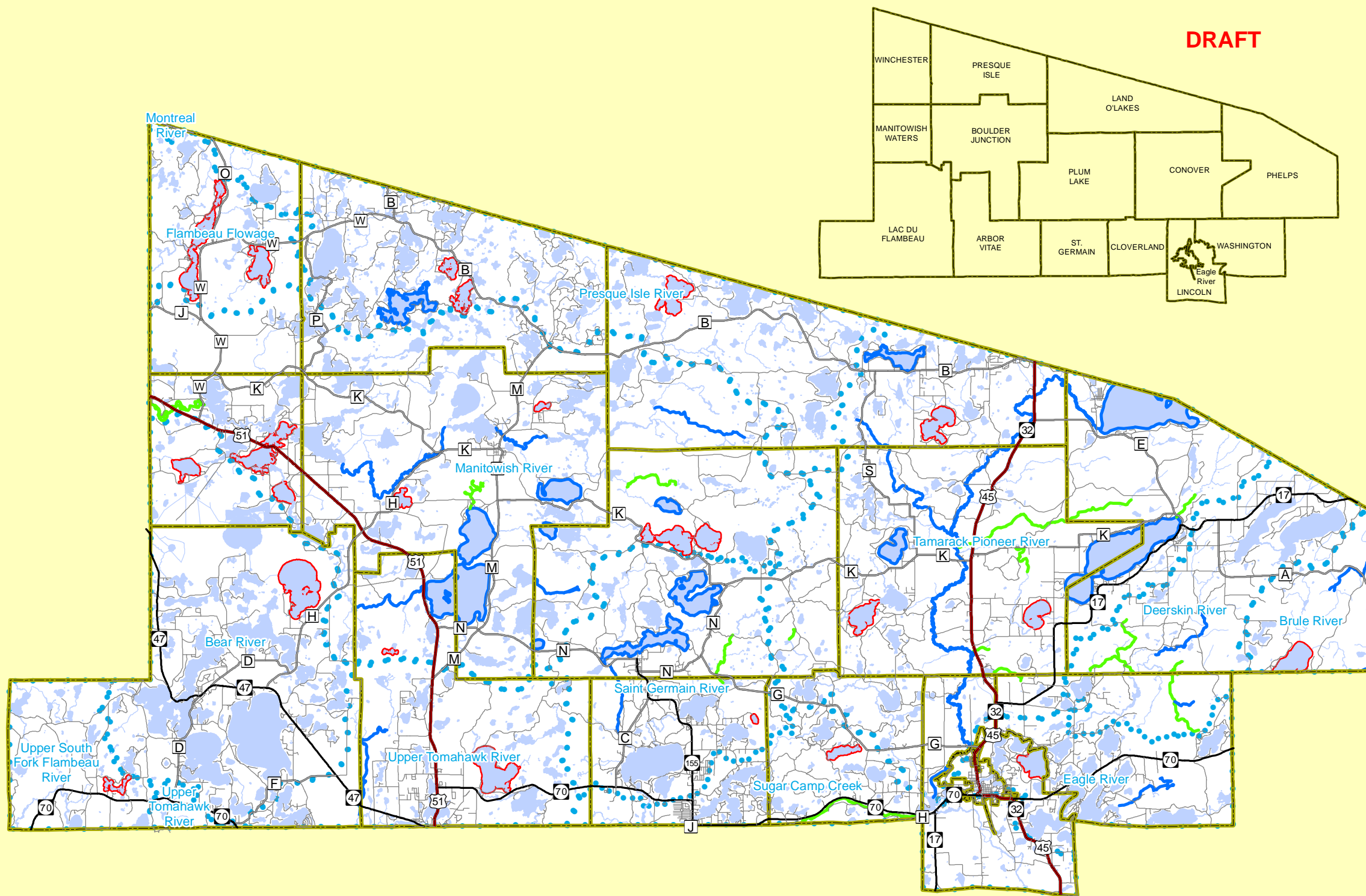
Source: WI DNR, NCWRPC, Vilas County Mapping Dept  
 Vilas Co. Land & Water Conservation Dept.

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



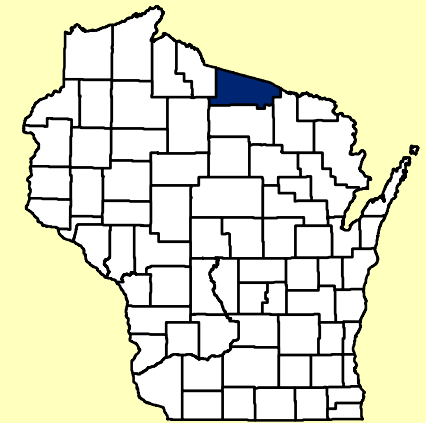
Prepared By:  
**North Central Wisconsin Regional Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
 715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org



**DRAFT**

**DRAFT**

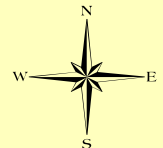
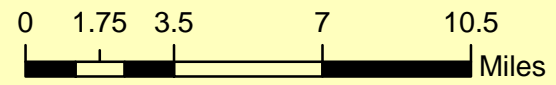


**Legend**

- Minor Civil Divisions
- US Highway
- State Highway
- County Highways
- Local Roads
- Water
- Watershed Boundaries
- 303(d)
- ERW
- ORW

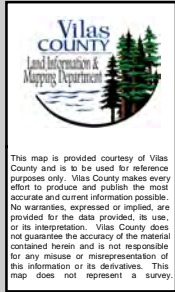
Source: WI DNR, NCWRPC, Vilas County Mapping Dept

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



Prepared By:  
**North Central Wisconsin Regional Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
 715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org



# LAKE CLASSIFICATION

Vilas County, Wisconsin

This map is a compilation of several data sources. Foth & Van Dyke, and the Vilas County Mapping Dept. Section lines based on Vilas County's GPS Network.



Printed by Vilas County Mapping Dept. 8/04/2009

# 3

**MAP SYMBOLS**

- Municipal Boundaries
- Section Lines
- Waterbody
- Federal / State Highway
- County Highway
- Town Roads
- Private Roads
- Indian/Tribal Roads
- Forest Roads
- Other Roads
- Airport Runways
- Bridges

**LAKE CLASSIFICATION DATA**

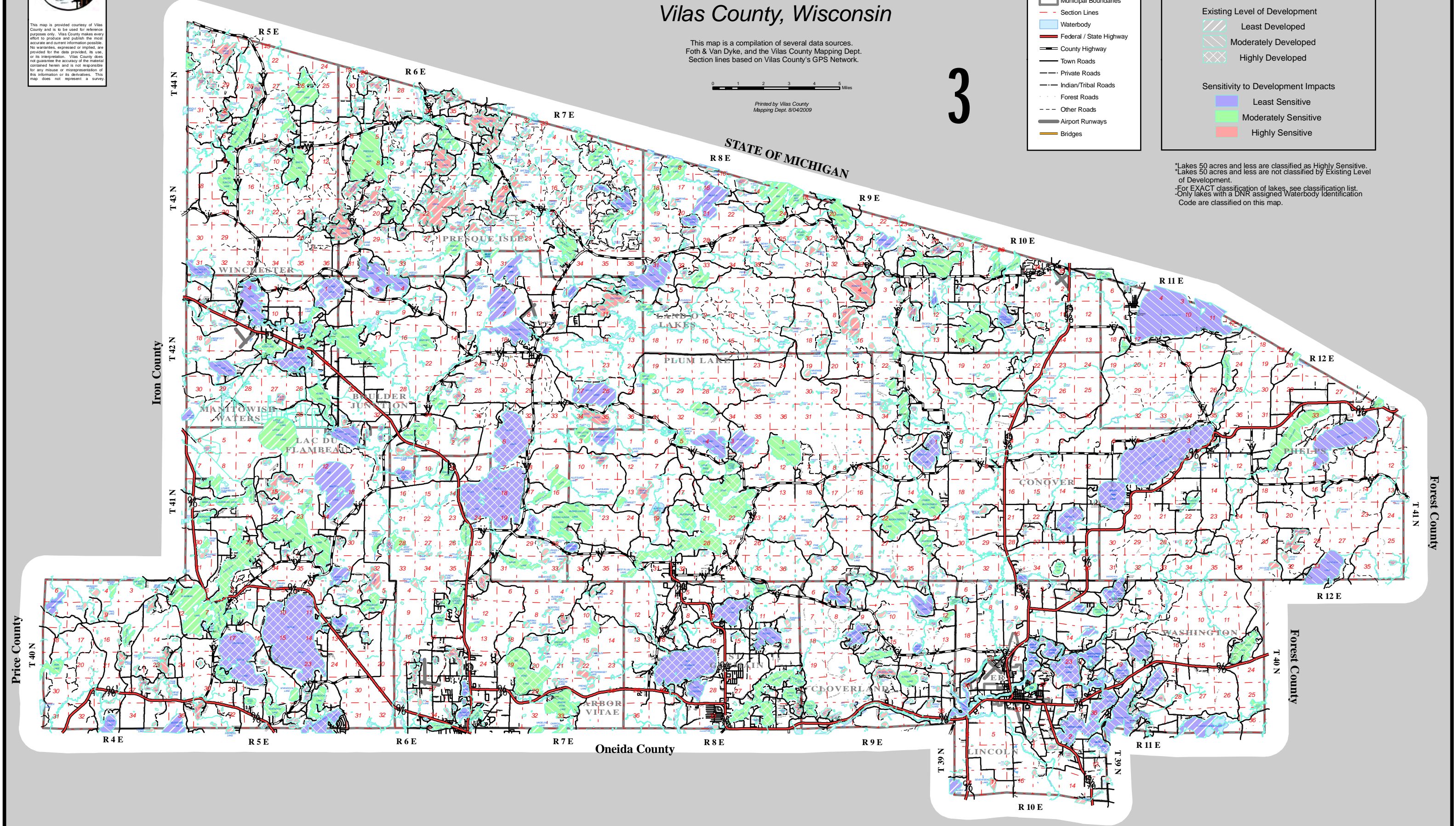
Existing Level of Development

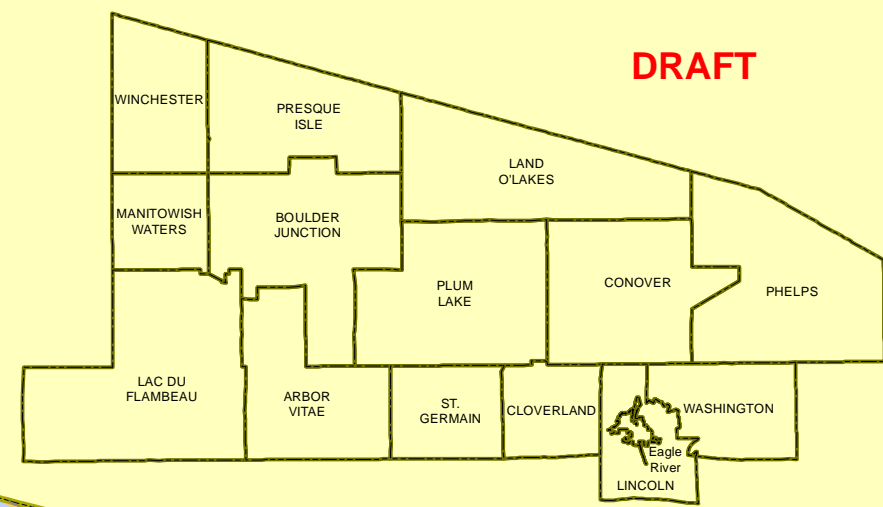
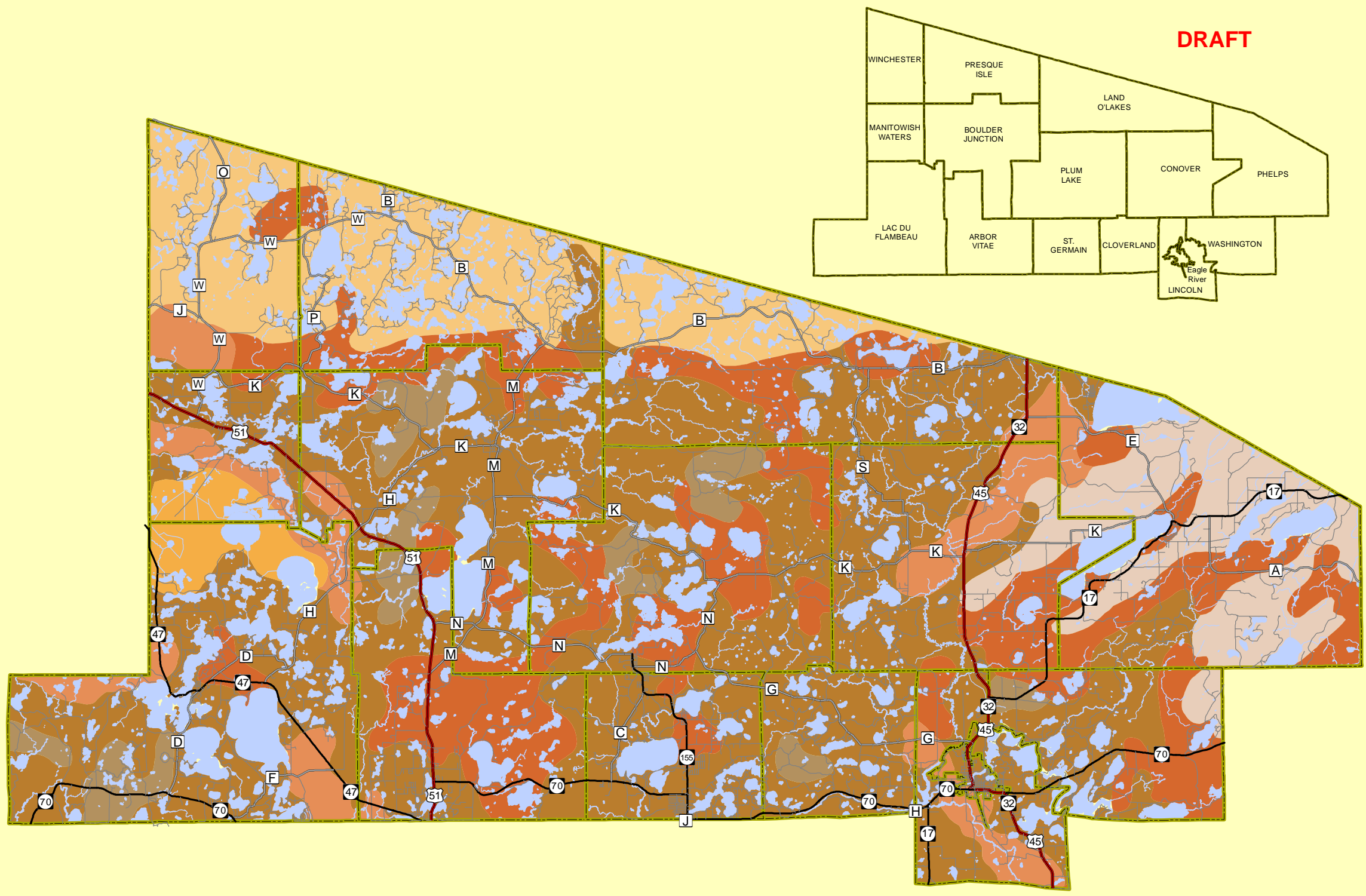
- Least Developed
- Moderately Developed
- Highly Developed

Sensitivity to Development Impacts

- Least Sensitive
- Moderately Sensitive
- Highly Sensitive

\*Lakes 50 acres and less are classified as Highly Sensitive.  
 \*Lakes 50 acres and less are not classified by Existing Level of Development.  
 -For EXACT classification of lakes, see classification list.  
 -Only lakes with a DNR assigned Waterbody Identification Code are classified on this map.

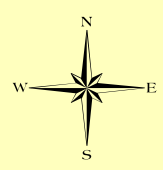
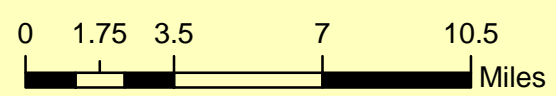




**Legend**

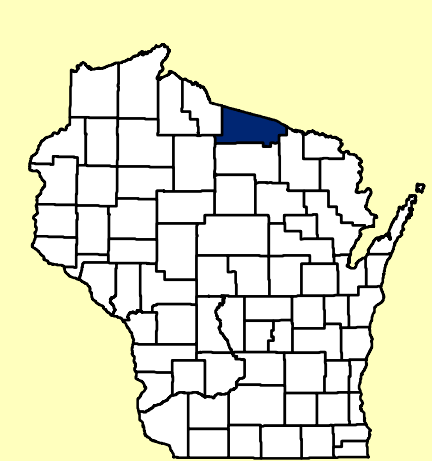
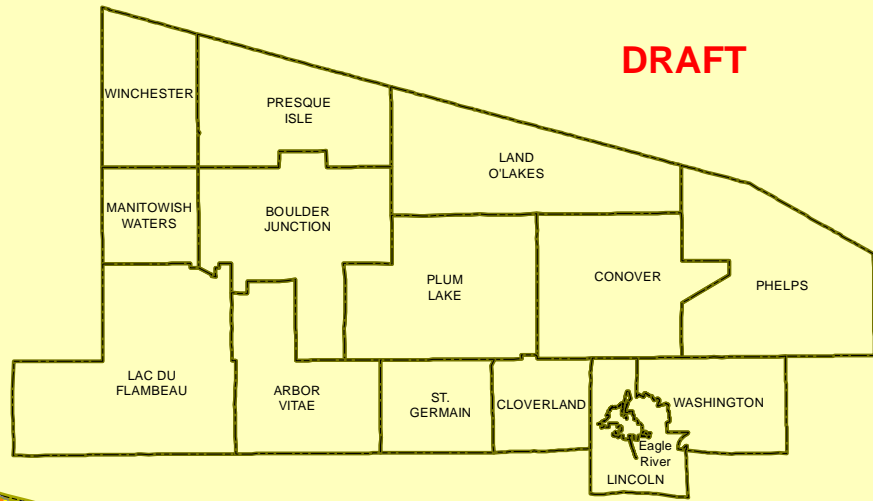
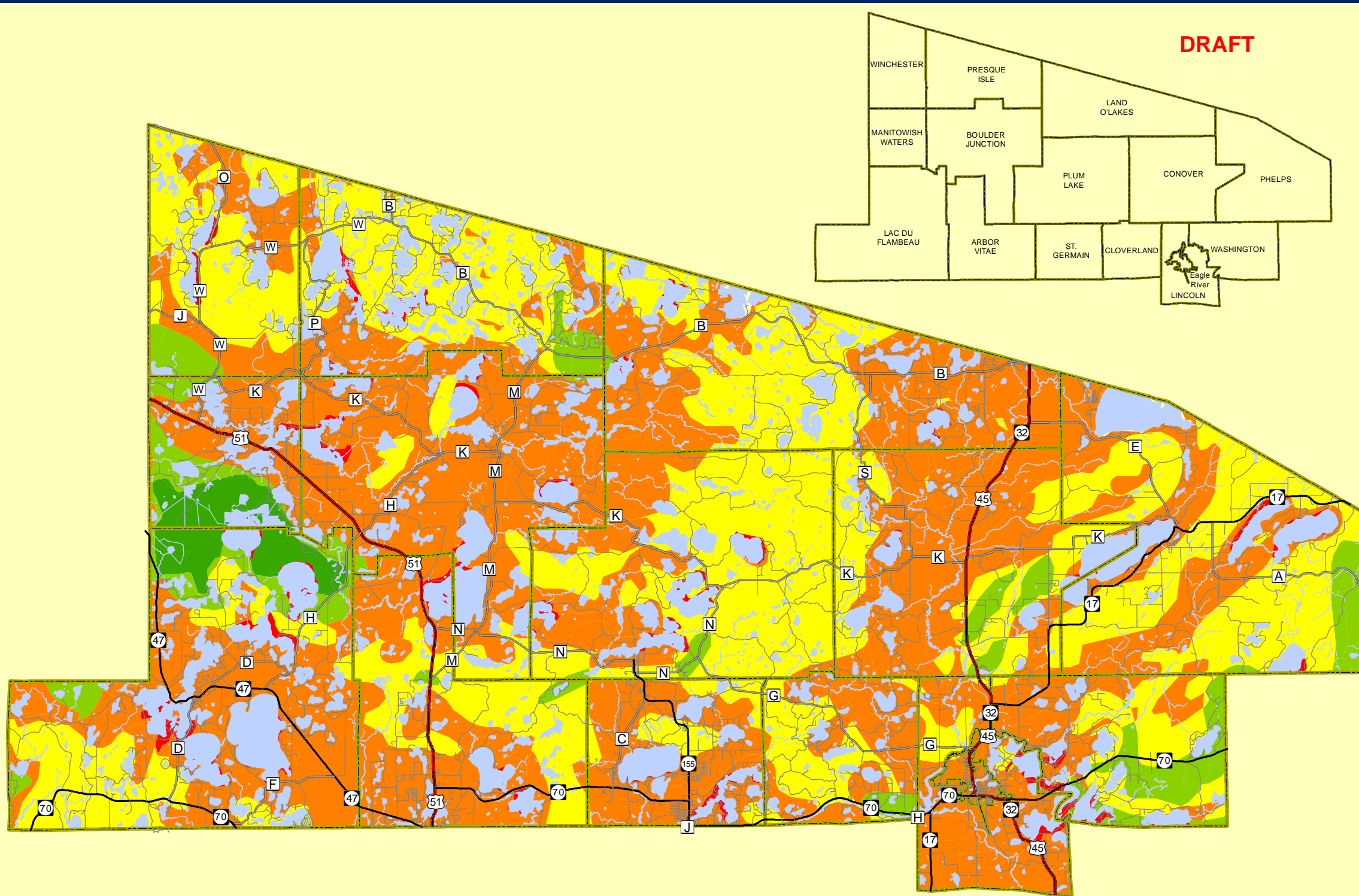
- Minor Civil Divisions
- US Highway
- State Highway
- County Highways
- Local Roads
- AU GRES-CROSWELL-KINROSS (WI009)
- CHAMPION-WABENO-MONICO (WI017)
- GOGEBIC-SARONA-WITBECK (WI002)
- KEWEENAW-SARONA-KARLIN (WI016)
- PADUS-PENCE-GREENWOOD (WI006)
- RIFLE-LOXLEY-CATHRO (WI003)
- SAYNER-RUBICON-OMEGA (WI005)
- Water

Source: WI DNR, NCWRPC, Vilas County Mapping Dept  
 This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



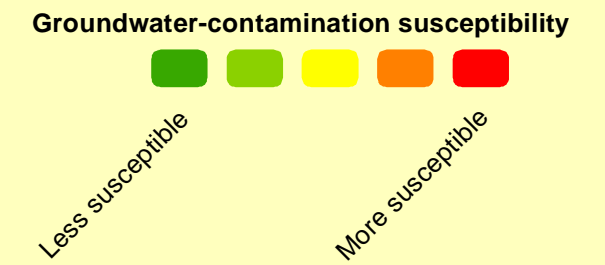
Prepared By:  
**North Central Wisconsin Regional Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
 715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org



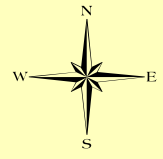
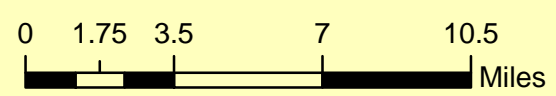
**Legend**

- Minor Civil Divisions
- US Highway
- State Highway
- County Highways
- Local Roads
- Water



Source: WI DNR, NCWRPC, Vilas County Mapping Dept

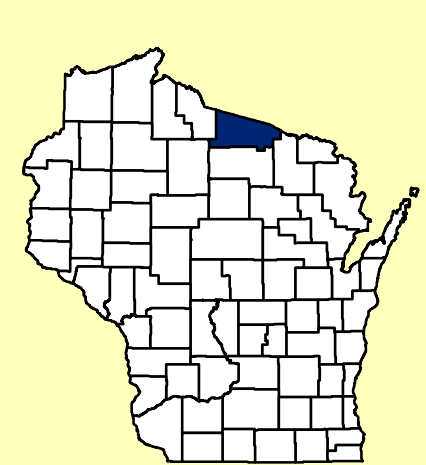
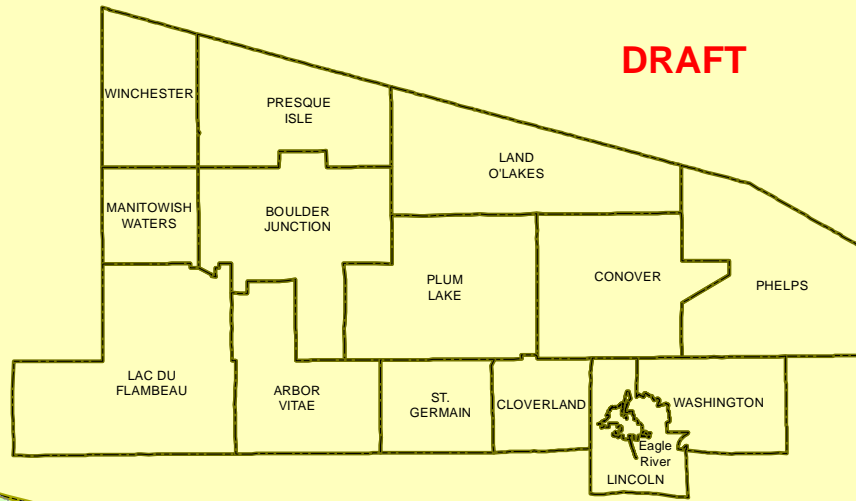
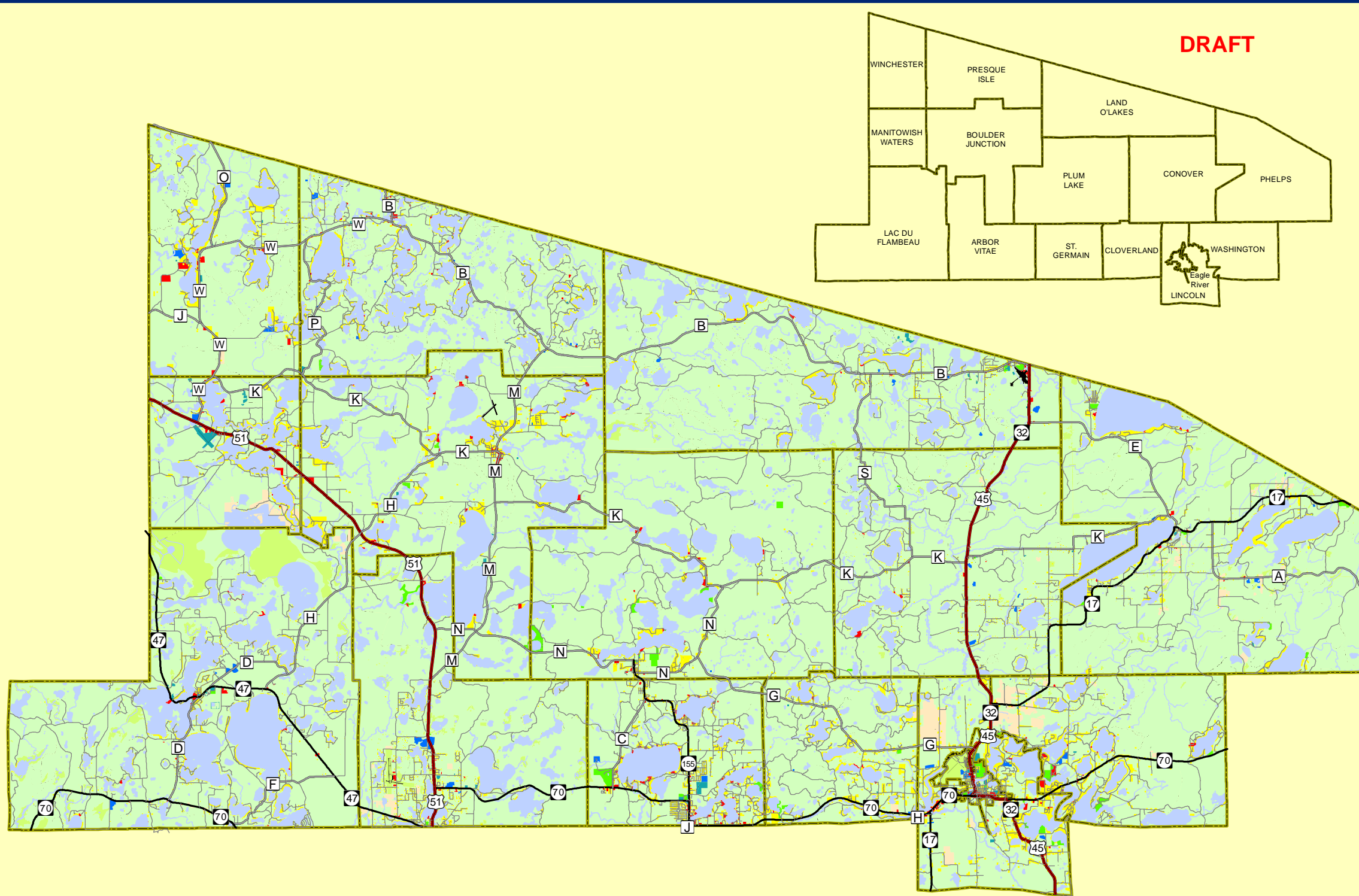
This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



Prepared By:  
**North Central  
 Wisconsin Regional  
 Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
 715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org



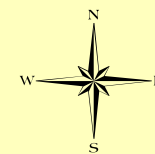
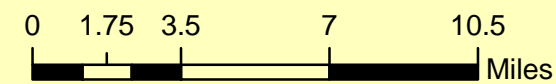


**Legend**

- Minor Civil Divisions
- US Highway
- State Highway
- County Highways
- Local Roads
- Agriculture
- Commercial
- Governmental
- Industrial
- Open Lands
- Outdoor Recreation
- Residential
- Transportation
- Woodlands
- Water

Source: WI DNR, NCWRPC, Vilas County Mapping Dept

This map is neither a legally recorded map nor a survey and is not intended to be used as one. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.



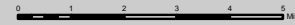
Prepared By:  
**North Central  
 Wisconsin Regional  
 Planning Commission**

210 McClellan St., Suite 210, Wausau, WI 54403  
 715-849-5510 - staff@ncwrpc.org - www.ncwrpc.org

# LAND & RESOURCE PROTECTION

## Vilas County, Wisconsin

This map is a compilation of several data sources.  
Foth & Van Dyke, North Central Regional Planning Commission,  
and the Vilas County Mapping Dept.  
Section lines based on Vilas County's GPS Network.



# 3

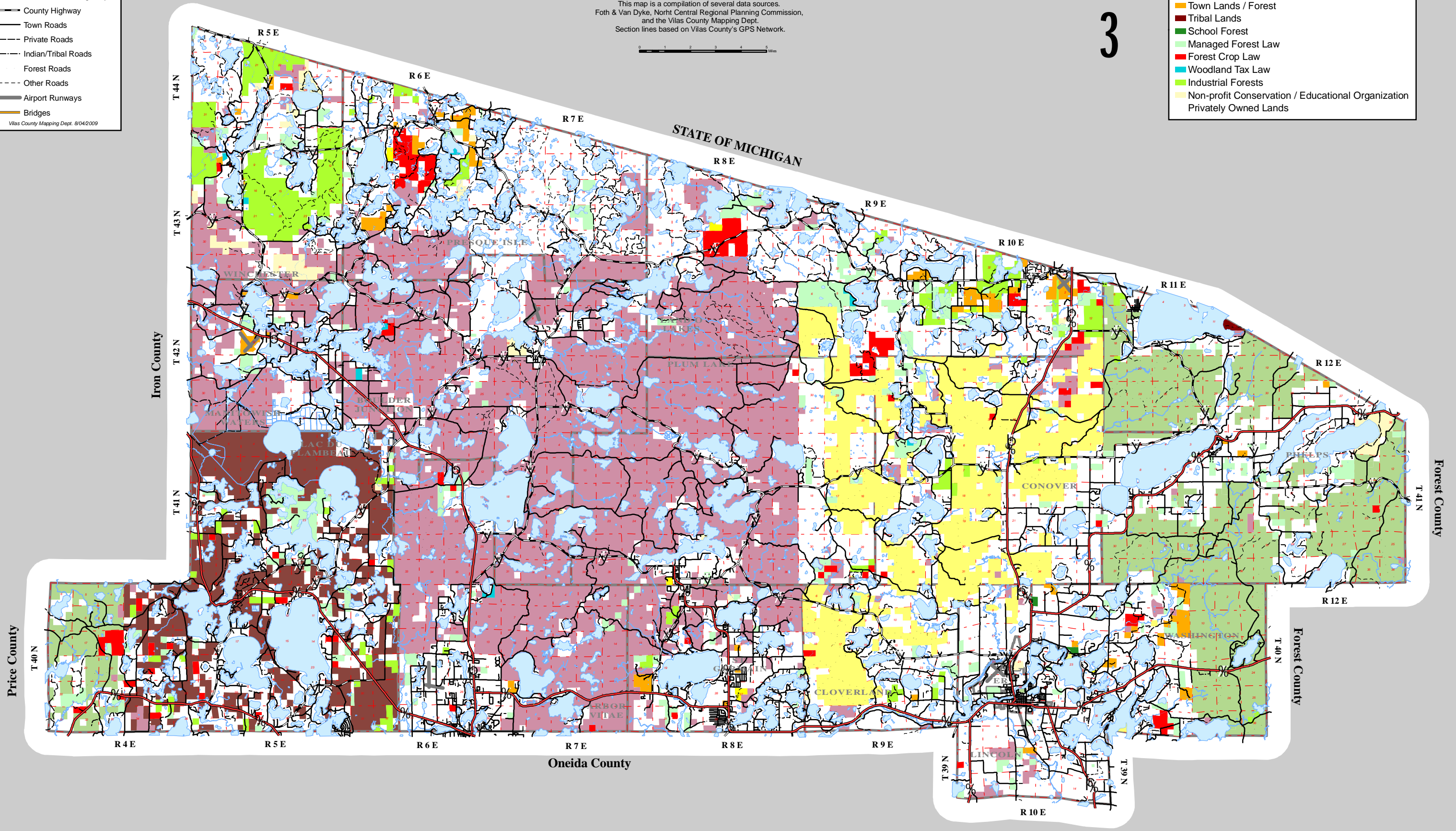
**Legend**

- Municipal Boundaries
- Section Lines
- sde.GIS.sections
- Waterbody
- Federal / State Highway
- County Highway
- Town Roads
- Private Roads
- Indian/Tribal Roads
- Forest Roads
- Other Roads
- Airport Runways
- Bridges

Vilas County Mapping Dept. 8/04/2009

**Land & Resources Protection**

- National Forest
- State Lands / Forest
- County Lands / Forest
- Town Lands / Forest
- Tribal Lands
- School Forest
- Managed Forest Law
- Forest Crop Law
- Woodland Tax Law
- Industrial Forests
- Non-profit Conservation / Educational Organization
- Privately Owned Lands



# 2009-2014 WORK PLAN ACCOMPLISHMENTS

## Chapter 3

This section summarizes the accomplishments and activities completed from the 2009-2014 Vilas County Work Plan to date. Knowing what has been completed or needs more attention helps us to determine which actions to continue when creating the next 5-year Work Plan. Land and Water Conservation Department and Land Conservation Committee accomplishments are described here in the following categories: Information and Education, Legislative Action, Technical Assistance, Grants and Funding, Coordination and Administration. Most of the categories are then further defined to describe specific elements.

### INFORMATION and EDUCATION

Through the support of county conservation staff and the oversight committee, Vilas County Land and Water Conservation has earned a first class reputation both locally and statewide for our knowledge, commitment, and innovation in conservation matters. Our information and education programs have been paramount in earning the respect and admiration of our peers. Information and education has a strong emphasis in all of our 2009 -2014 work plan goals. The information below summarizes most activities that the Land and Water Conservation staff have accomplished in educating youth of all ages, increasing public awareness and increasing our own professional capacities over the past 5 years.

#### Youth Education

- We have sponsored local youth conservation awareness poster contests at the elementary & middle school levels. Our students have won various competitions from both regional and statewide poster contests;
- For 3 years, we have served as committee planners, camp counselors, presenters, and camp cooks for the WLWCA sponsored Youth Conservation Camp at Trails End Camp / Rusk County;
- For the past 2 years, our role for Youth Conservation Camp has been elevated to camp host, planner, camp executive director, camp counselors, and presenters for the WLWCA sponsored Youth Conservation Camp at Trees For Tomorrow in Eagle River.
- Three of the regional school districts and several teachers asked us for assistance in completing environmental programming:
  - Elementary aged students (K-5) have received programs in AIS management and prevention, and information on conservation careers;
  - Middle school aged students (6-8) have enjoyed programs in stream ecology, AIS identification and management, and water quality testing;
  - High School students (9-12) have received information about lake ecology, AIS biology, prevention, and management. We've coordinated field studies (complete with pontoon classrooms) to create hands-on learning opportunities for students to see how lake managers collect scientific data. We have coordinated a field experience for the students to rear *Galerucella* beetles and manage local populations of invasive purple loosestrife.



## Media / Publications

- We seek out the local media (radio, television, newspapers) to attend or do stories about our programs and as another opportunity to reach the public with conservation messages.
- Completed and distributed an informational brochure that describes the Land & Water Conservation Department, our staff, and what we offer in services to assist the public.
- Considerable effort has gone into revitalizing our Department website. Effort to update and improve the website is ongoing and will continue to be a priority for the Department.

## Conservation Observance Day

The Land and Water Conservation Department staff initiated, coordinated, and hosted a day-long *Conservation Observance Day* at Trees for Tomorrow centered around celebrating youth education. The event drew 30+ attendees – citizens and professionals alike. We coordinated this event in June of 2012 in part because of the switch-over of the Youth Conservation Camp from the traditional Rusk County Trails End Camp to Vilas County. The following day was the beginning of Conservation Camp for 30 high school students who descended upon the campus of Trees for Tomorrow.



During the afternoon of observance day, we celebrated the life of the late DATCP Secretary Rod Nilsestuen. A maple tree was planted in his memory and a presentation celebrating his accomplishments was conducted. The tree planted on the grounds of the Trees For Tomorrow campus in Eagle River will remain there in perpetuity to remind visitors of his legacy to Wisconsin Conservation.

## Presentations

- We have awakened members of the general public, the Wisconsin Legislature, and our professional peers about the detrimental ecological effects of aquatic and terrestrial invasive species and to coordinate citizen prevention measures.
- Combined staff have prepared and delivered 300+ Powerpoint presentations to lake groups, delivered various types of presentations at state conventions, workshops, and lakes fairs on a wide variety of conservation subject matter; including but not limited to: Forest & wildlife management programs, lake water quality testing, loon biology, shoreland buffers and restoration, AIS chemical treatment and research reports, soil erosion control, rain gardens, native aquatic and terrestrial plants, aquatic plant management, comprehensive lake management planning, lake grant programs, boating safety, recreational use patterns and conflict resolution, how to form a lake association or district, invasive terrestrial plant identification, etc.

### Professional Development

We believe that it is essential for personal professional growth, development, and improvement that individuals attend and participate in on-going educational opportunities that are significant to their perspective department positions. Professional development and on-going opportunities for learning allow our staff to stay up-to-date and informed on current issues in conservation, and thus, relay this information to others. Our staff and elected LCC members have participated in (and/or have been active members of planning committees for) the annual statewide WI Lakes Convention, the annual WLWCA Conference, Lake District Commissioner training, Lake Leaders Institute, Aquatic Plant Identification refresher workshops, Vilas Visions Leadership programs, *Clean Boats / Clean Waters* workshops, AIS Coordinator meetings, regional invasive species conferences, quarterly County Conservationist meetings, and quarterly Lakes Partnership meetings.

### Special Professional Recognition

**Carolyn Scholl**, Vilas County Conservationist was recognized by the Wisconsin Lakes Partnership in 2010 with a Wisconsin Lake Stewardship Award in the Public Service Category for her continual strong dedication to lake protection.



In 2012, **Ted Ritter**, the Vilas County Invasive Species Coordinator was recognized by the Wisconsin Invasive Species Council with an Invader Crusader award to celebrate his outstanding achievements in forwarding invasive species initiatives in Wisconsin.

## **LEGISLATIVE ACTION**

Vilas County has been innovative in the democratic processes of the state when issues of concern over natural resource management or matters concerning the county LWRM goals are being threatened in some way. The information outlined below gives an overview of some of the legislative actions that the county has taken.

### Action by Resolution

The Land and Water Conservation Committee have moved several resolutions to the full county board for consideration, to NCLWCA, and to the WLWCA regarding environmentally sensitive or financially sensitive issues. Issues of concern voiced by resolution adoption were as follows: to sustain the full-time county Invasive Species Coordinator, forward movement to amend the comprehensive plan and certify the Farmland Preservation Plan, support of numerous grant

applications to support conservation staff, rejecting the DATCP proposal to further cut County Conservation staffing grants, support of the act to create 94.643 WI Statutes relating to phosphorus fertilizer use restrictions, support of a groundwater testing and education program, reducing the spread of Asian Carp throughout the Great Lakes Basin, to urge the legislature to increase funding for the purpose of managing aquatic invasive species, to support or deny petitions for the formation of two lake districts, and to support numerous lake management project grant applications.

#### Public Representation and Participation

Vilas County continues to support and hold membership in our regional and state associations – North Central Land & Water Conservation Association and Wisconsin Land & Water Conservation Association, and the county conservationist currently serves on the board of directors for the WLWCA as the elected staff representative from NCLWCA.

Elected county board officials further serve as county representatives on the lake district commissioner boards of Alma-Moon, Big St. Germain, Kentuck, Little Arbor Vitae, Little St. Germain, Little Tamarack, Long, Lost, Spectacle, and Stella Lakes.

Former County Board Supervisor, Mary Platner, serves on the Lumberjack RC&D Council as an at-large member.

### **TECHNICAL ASSISTANCE**

Vilas County provides technical assistance in a variety of ways to citizens of Vilas County. Examples of technical assistance and projects offered to the public from 2009-2014 are outlined below.

#### Cost-Share Conservation Projects

From 2009-2014, we provided technical plans and cost-share assistance to an estimated 50+ landowners and implemented conservation projects in the amount of approximately \$265,480. During a typical summer in Vilas County, when the tourist season is at its peak, our office receives an estimated 15-20 requests per week for information about numerous conservation topics such as aquatic invasive species identification and management, to questions about cost-share assistance, to freshwater algae identification or water quality training requests. Best efforts were made to consider and respond to the public's requests in a timely fashion in the form of telephone follow-ups, email response, or direct conversations with walk-in traffic.

#### Vilas County Groundwater Study and Education Project

Beginning in 2010, a grant proposal was drafted that sought money from Lumberjack RC&D to accomplish a county-wide groundwater testing and education project. We were excited to receive the grant and begin the study in 2011. In cooperation with the lab at UW-Stevens Point Center for Watershed Science, the County arranged for samples to be tested for bacteria, nitrate, arsenic, lead, pH, corrosivity, chloride, & more. We wanted to educate residents about the current quality of their drinking water, why it is important to periodically re-sample their drinking water, and the corrective options available to them in case a problem was detected. Department staff assisted in the design of and implementation phases of the project, in addition

to seeking grant funding and public dissemination of the results. Free tests were offered to 110 residents randomly selected throughout the county. After tests were completed two education workshops were offered where they could receive their results and learn more. There was high demand for these tests, and the project was very successful. It is our intention to conduct a similar project as a ten year comparison, if funding allows.

#### Vilas County Terrestrial Invasives Inventory Project

In 2011, Vilas County hired a very qualified summer LTE to coordinate and implement an inventory project on selected private forest lands. Eighteen volunteer landowners participated which constituted 3,725 acres of forest land. Terrestrial invasives were found on 9 of the properties, and included Eurasian bush honeysuckle, Japanese barberry, and one finding of garlic mustard. Two of those properties were majorly infested (approx 600 acres) with honeysuckle and some barberry. Maps were created for each of the landowners, so they could manage the problem populations, and each of them received written management plans and options for their property.

#### Cost-Share Policy – Tier System

Many landowners seek cost-share assistance from our Department in any given year. Because of continuous declines in cost share dollars available to counties, it became necessary to develop a formalized policy by which priority assistance was given to sites that presented high threat to water quality from soil erosion and/or nutrient input. In addition, there was a need to improve the distribution of conservation practice implementation on the land. The intent of this policy was to clarify what conservation practices are available to private landowners in Vilas County under the Conservation Cost Share Program and in which percentage level of grant coverage those practices will be cost shared. Details of this policy are located in Attachment D. Objectives for the policy are listed below:

- To initiate a cost containment measure that will serve to divide the grant funding received in Vilas County annually to provide conservation projects to as many private landowners as possible in a given year.
- To offer cost-sharing grant incentives to private landowners who voluntarily choose to implement conservation practices on their land.
- To prioritize the conservation practices implemented on the land that will meet goals and objectives outlined in the most current Land and Water Conservation Resource Management Plan.

#### Aquatic Invasive Species Partnership

Back in 2006, substantial assistance to the public in all aspects of aquatic invasive species management was provided through the formation of the *Vilas County AIS Partnership*. We were (and continue to be) overwhelmed with the workload that AIS issues generate. Since then, progress with heightened public awareness of AIS issues and prevention measures has increased significantly in the county (and statewide). A strategic management plan for the AIS Partnership was created at that time, but was in need of updating and revision. In 2013, revisions to the AIS Strategic Plan were completed and activities from that plan have been incorporated into the current Land & Water Resource Management work plan. We will continue to educate the public and solicit volunteers to monitor for invasive species at the local level; report their findings to the

WDNR and to Town boards; give ID trainings and workshops; apply for (and receive) grant funding for treatment of existing AIS or for AIS prevention projects.

#### Wisconsin Headwaters Invasive Partnership

In 2011, the Invasive Species Coordinator focused on raising public awareness levels of terrestrial invasive species in the county and coordinating partnership building with the newly created Wisconsin Headwaters Invasive Partnership (WHIP). Today, a multi-partner co-op serving Vilas and Oneida Counties exists because of the coordination efforts that Vilas County had contributed. Until then, there had not been any other formalized partnership that focused on terrestrial invasive species. Partners from 14 entities - federal, state, local governments, and other partners have formally signed a memorandum of understanding to cooperate in WHIP activities. The WHIP members meet regularly, where TIS management, education, and plans for project implementation are discussed.

#### Point-Intercept Macrophyte Surveys

Vilas County lent assistance to the local WDNR and UW-Trout Lake staff with various AIS-related field operations within the boundaries of Vilas County. During the 2011 field season, the Conservation Specialist assisted in a Point-Intercept survey of the aquatic vegetation of Kentuck Lake (a very large 1000+ acre lake) with local WDNR staff, allowing them to schedule two work teams and have the survey completed in less than a week! The WDNR recognized the expertise provided by the Conservation Specialist, especially in aquatic macrophyte identification skills. Very few people have the thorough knowledge required for conducting these types of specialized surveys. For a County with a large lake fieldwork load and a tremendously short field season, professional manpower is essential and this was a huge time savings for our regional partners in the WDNR. Assistance to the WDNR in conducting point intercept surveys has continued in recent years, and several lakes in Vilas County now receive this beneficial service.

#### Grant Program Assistance

Vilas County LWCD staff are well-versed in the WDNR lake grant programs, and have assisted many groups seeking project funding through the state. From 2009-2014, we have assisted an estimated 75+ groups in applying for lake grant funding. Many of these local groups would not have applied for (or received) grant funding if it were not for the technical expertise and encouragement gained from our Department.

#### Water Level Issues/Dam Maintenance

Vilas County owns several operating dams that are maintained through the Land and Water Conservation Committee. In some instances, agreements are made with local lake groups or municipalities to handle daily maintenance of these systems (Lost Lake in St. Germain). Technical expertise and assistance from Department staff has been necessary to oversee these operations or to assist in the design and implementation of repairs or installation of water level gauges. In recent years, the county has been cooperating with residents from Conover to understand ownership and liability responsibility for the Little Tamarack Flowage Dam. After much debate, the association has formed a lake district formalized by the town of Conover. In the future, the lake district will assume the responsibility for dam maintenance and repairs.



### AIS Clean Boats/Clean Waters Program

What started out as a budding program back in 2009, has now grown to become a great opportunity for many college students to gain real-world experience in the field of AIS management. The watercraft inspection internship program is a cooperative effort between the Biology Department of University of Wisconsin, Oshkosh and the Vilas County Land and Water Conservation Department. It enables students to live and work in Vilas County from late May through approximately mid-August each summer. While performing watercraft inspections at public boat landings and educating boaters about aquatic invasive species, these students are gaining valuable working experience. Vilas County initiated a pilot program during the summer of 2010 to hire two students from the University of Oshkosh as full time watercraft inspectors. Lake organizations within Vilas County that were volunteer “challenged” then contracted directly with the university for a specified number of inspection hours. The role of the county Invasive Species Coordinator in the partnership became that for training, scheduling and general oversight of the interns. In 2011, students provided over 1,600 hours of inspection time at area boat landings. Even more interns were hired by UW-Oshkosh to serve as watercraft inspectors in 2012, and the program was expanded to 7 full-time students providing 2,800 hours of inspection time on Vilas County boat landings. By the field season of 2014, the program had expanded to 14 students!

### **GRANTS / FUNDING**

Vilas County did well in securing grant funding for purposes of implementing the goals and objectives outlined in the 2009-2014 work plan. Below is a breakdown of the monies that were secured and administered through the Land and Water Conservation Department only. It does not include the grant dollars secured by individual lake organizations, local municipalities, and tribal government to accomplish various lake management and aquatic invasive species management and prevention projects.

- \$ 634,075 in Staffing support from DATCP
- \$ 272,495 in LWRM Project Implementation from DATCP
- \$ 271,773 in Lake Management Grants from WDNR
- \$ 11,760 in Lumberjack RC&D funds
- \$ 53,365 in support of the WDNR Wildlife Damage and Abatement Program

### **COORDINATION / ADMINISTRATION**

In order to accomplish our 2009-2014 LWRMP goals, a great deal of coordination and administrative activity took place. Department staff and the Land and Water Conservation Committee members provided community leadership that was necessary to pull together activities, partnerships, funding, projects, and logistics that ultimately completed Work Plan actions so that the Work Plan goals were met. In the past 5 years, the Conservation Department has demonstrated strong leadership with considerable administrative time and effort expended.

### Partnerships

The County Conservation Department has led the process to initiate, coordinate, and establish WHIP (the local Cooperative Weed Management Area); provided assistance as needed to 12 Town Lakes Committees; initiated legislative actions that have led to significant changes in the state's AIS legislation; have partnered with NCWRPC on the revision of the Farmland Preservation Plan as a result of the Wisconsin Working Lands Initiative; and have initiated the expansion of the Clean Boats Clean Water Program in cooperation with UW-Oshkosh.

### Group Assistance

Personnel from the Land Conservation Department have actively participated on annual planning committees for the Wisconsin Lakes Convention; provided assistance in program and fund development for 12 established Town Lakes Committees; we have led groups through the statutory process of establishing new Lake Districts; we have coordinated efforts for countless individual Lake Associations, the Eagle River Chain of Lakes Association, and the Vilas County Lakes and Rivers Association in an advisory capacity; we've coordinated field operations for TIS management projects; and have lent assistance to landowners (including municipalities) in soil erosion and other conservation projects. Staff has also conducted regular follow-up compliance checks on conservation project sites, to contractors, and to landowners to ensure that proper tasks have been completed in a timely manner (contract agreements, project installations, and compliance to operation and maintenance procedures).

### Sponsorship

On an annual basis, the Department has sponsored students for participation in the annual youth conservation awareness poster contest, we provide funding to one high school student each year to attend the Youth Conservation Camp held one week per year in Vilas County, and we have offered teachers an annual stipend to take an environmental course to earn credits toward their continuing education.

### Volunteers

In the past 5 years Vilas County has initiated and trained over 300 citizen volunteers to monitor for AIS/TIS, to gather and report water clarity and chemical data on lakes, to monitor and report loon activity for the LoonWatch program, and train citizens in the importance of installing native plants and other soil erosion practices on a voluntary basis.

### Administration

Department staff has been effective in administration of DATCP programs such as timely submittal of annual staffing grant applications, SWRM grant applications, biannual reimbursements for staffing/support/SWRM funding, annual LWRM plan progress reporting, creation of formal policies for project tier funding and technical fee structure, and all contract paperwork for LWRM plan implementation projects; other annual administrative responsibilities include the financial administration of the Wildlife Damage and Abatement Program, development of the annual Department budget for the county, LWRM plan 5-year work plan revision process, human resource management duties and annual evaluations, and WDNR lake grant project funding and reporting as necessary.

# 2015-2019 WORK PLAN / BUDGET

## Chapter 4

*The Vision of Vilas County Conservation is to protect, maintain, and restore aquatic and terrestrial ecosystems in order to preserve the strong recreation and tourism-based economy which is dependent upon a healthy natural environment*

**WORK PLAN:** Our mission *to protect the county's natural communities from degradation* will be implemented through the following work plan over the course of a five-year period, beginning in 2015 and extending through 2019. The goals outlined in the following pages represent how Vilas Conservation can address the resource concerns that have been identified by both the *Resource Advisory Committee* and the natural resource assessment prepared by the North Central Wisconsin Regional Planning Commission. The activities provide more detailed and measurable steps toward reaching each goal. The LWCD personnel along with agency partners, lake groups, and citizen volunteers will implement all action items as people, time, and funding become available.

The goals are listed below in order of priority as determined by the Vilas County Land and Water Conservation Committee/Department in association with recommendations from the *Resource Advisory Committee*. Soil erosion from croplands is not a major source of pollution in Vilas County since so little of the county is farmed. However, soil erosion from many other cumulative sources around the county are considered and addressed. Technical assistance to various focus groups and educational outreach to the general public are important components of the county conservation program.

### 2015-2019 Work Plan Goals:

- Goal 1: Increase the public's level of natural resource knowledge and stewardship
- Goal 2: Protect aquatic and terrestrial environments from non-point source pollutants
- Goal 3: Protect aquatic, terrestrial, and wetland ecosystems from invasive species
- Goal 4: Organize sites of concern within watersheds, wetlands, lakes, and forests
- Goal 5: Attend to state and local conservation funding and policy issues

The priority objectives and activities listed are shown in bold font, as are the lead agencies that are to complete or initiate the tasks. Although federal 319 funds to address impaired waters have not historically been available as revenue for Vilas County, we have included a county personnel action to review others' plans for inclusion of the 9 key elements required of watershed management plans if impaired water issues would become a problem in the future. Tracking measures given will allow for ease of annual reporting to the state and findings as to the successes of the work plan activities. The timeline for activities has been broken down into the following: On-going, As Needed, Annual, or

specified year of completion. An “On-going” activity means that it is constant and within the daily realm of county staff duties. An activity marked “As Needed” implies that staff will complete it when requested, or when necessary to meet a given objective. Work plan activities will take place each year from 2015 through 2019. An update to the activities outlined here will take place again in 2020.

Specific goals, objectives, and activities are detailed in the Work Plan on the following pages.

**BUDGET ESTIMATE:** An annual estimated budget for the 2015-2019 work plan is outlined here. In estimating the budget, it is presumed that the county will continue to staff the Land and Water Conservation Department at its current level of three persons. It is further presumed that DATCP / WDNR will meet their financial obligations for staffing of local conservation personnel and projects.

YEAR	COUNTY	DATCP	WDNR	OTHER	TOTAL ESTIMATE
2015	\$ 50,000	\$ 160,000	\$ 58,500	\$ 40,500	\$ 309,000
2016	\$ 50,000	\$ 140,000	\$ 117,000	\$ 40,500	\$ 347,500
2017	\$ 50,000	\$ 140,000	\$ 117,000	\$ 40,500	\$ 347,500
2018	\$ 50,000	\$ 140,000	\$ 117,000	\$ 40,500	\$ 347,500
2019	\$ 50,000	\$ 140,000	\$ 81,000	\$ 52,500	\$ 323,500

Vilas County has been successful in attaining funding from a number of sources in the past. During the implementation phase of the following work plan, we intend to continue applying for grants to sustain the current level of staff and project funding. Potential sources of conservation funding may come from the following:

- Natural Resource Conservation Service (NRCS) Public Assistance Programs
- Department of Agriculture, Trade, and Consumer Protection (DATCP) Soil and Water Resource Management funding
- Department of Agriculture, Trade, and Consumer Protection (DATCP) Farmland Preservation Planning Grant Program
- Wisconsin Department of Natural Resources (WDNR) Lake Planning and Protection Grant Programs; and AIS Education & Management Programs
- Wisconsin Department of Natural Resources (WDNR) Targeted Runoff Management Program - Small scale non-TMDL projects
- Vilas County Annual Tax Levy Assessments
- Lumberjack Resource Conservation & Development (RC&D)
- National Science Foundation
- Great Lakes Restoration Funds
- Others as they may become available

**Goal 1: Increase the publics' level of natural resource knowledge and stewardship**  
*(Resource Concerns – I&E for all county natural resources & programs)*

Objective	Activities (Bold = Priorities)	Responsible Agencies	Tracking Measure
A. Provide education to lake organizations	<ol style="list-style-type: none"> <li>1. Assist groups wishing to form a lake organization</li> <li>2. Provide training for lake district commissioners</li> <li>3. Create a written guidance document for groups interested in forming a lake district in Vilas County – include guidance for elected officials</li> <li><b>4. Give minimum of 10 presentations on conservation topics to local lake groups at their annual meetings</b></li> <li>5. Train citizen volunteers in data collection methods for monitoring of water quality, wildlife, aquatic plants, blue-green algae, etc.</li> <li>6. Expand work efforts of Town Lakes Committees beyond AIS matters</li> <li><b>7. Foster 10 citizen volunteers to collect environmental data that will enhance their stewardship ethic and a sense of community</b></li> </ol>	<p>LWCD, UWEX</p> <p>LWCD, UWEX</p> <p>LWCD, VCLRA</p> <p>LWCD</p> <p>LWCD, WL, UWEX, WDNR</p> <p>LWCD, Towns</p> <p>LWCD, WDNR, UWEX, WL, VCLRA, WHIP</p>	<p>As-Needed</p> <p>Annual 1 Training Document complete</p> <p>Annual 10+ presentations</p> <p>Annual 15+ volunteers</p> <p>On-going</p> <p>Annual 10+ volunteers</p>
B. Provide information about groundwater and private wells	<ol style="list-style-type: none"> <li>1. Provide information and education on septic system impacts to groundwater and surface water quality and present ideas on proper septic maintenance.</li> <li><b>2. Host 1 workshop to educate the public about the UW Stevens Point well water testing program and encourage public participation</b></li> <li>3. Provide educational outreach to the public on groundwater issues (well decommissioning, high capacity wells, contamination, etc).</li> </ol>	<p>LWCD, Zoning</p> <p>LWCD, UWEX</p> <p>LWCD</p>	<p>As Needed</p> <p>2019 1 workshop</p> <p>As Needed</p>

GOAL 1 Continued on next page

C. Educate the public about wetlands	<ol style="list-style-type: none"> <li><b>1. Conduct a minimum of 8 presentations to describe how wetlands are important for water quality, flood control, wildlife diversity, and habitat protection</b></li> <li><b>2. Assist state and local organizations that are working to protect and/or enhance wetlands</b></li> </ol>	LWCD, UWEX, WDNR, WWA, TFT, Schools	Annual 8+ presentations
D. Provide youth education opportunities	<ol style="list-style-type: none"> <li><b>1. Coordinate, plan and implement the annual WI Land + Water conservation camp for high school youth</b></li> <li><b>2. Work with elementary teachers &amp; students on local Conservation Awareness Poster Contest</b></li> <li><b>3. Sponsor one student each year to attend conservation camp</b></li> <li><b>4. Develop a water quality field data collection and monitoring program for area schools; seek grant for equipment</b></li> <li><b>5. Provide stream / lake water quality workshops to middle school aged students</b></li> </ol>	LWCD, UWEX, WDNR, WWA	On-going
E. Provide news and updates	<ol style="list-style-type: none"> <li><b>1. Coordinate, plan and implement the annual WI Land + Water conservation camp for high school youth</b></li> <li><b>2. Work with elementary teachers &amp; students on local Conservation Awareness Poster Contest</b></li> <li><b>3. Sponsor one student each year to attend conservation camp</b></li> <li><b>4. Develop a water quality field data collection and monitoring program for area schools; seek grant for equipment</b></li> <li><b>5. Provide stream / lake water quality workshops to middle school aged students</b></li> </ol>	LWCD, Iron Co, WLWCA, TFT	Annual 30 students
F. Inform about shoreland management	<ol style="list-style-type: none"> <li><b>1. Enhance awareness and use of the LWCD website through presentations, press releases, workshops, meetings, and conferences.</b></li> <li><b>2. Email news clips to the interested public through a list serve</b></li> </ol>	LWCD, Schools, ER Library	Annual 60 students
F. Inform about shoreland management	<ol style="list-style-type: none"> <li><b>1. Provide education to Zoning staff and elected officials about the impacts of improper development near shoreline areas</b></li> <li><b>2. Promote best management practices (BMPs) on the land to municipalities, the highway department, landowners, foresters, contractors, and developers</b></li> </ol>	LWCD, Schools, ER Library	Annual 1 student sponsored
		LWCD, Schools, ER Library	2017-2018 Program developed
		LWCD, VCLRA, WAV, TFT	Annual 1+ workshop
		LWCD	On-going
		LWCD	On-going
		LWCD, Zoning, WDNR, UWEX	On-going
		LWCD, Zoning WDNR, UWEX, LDF-WR, WL, VCLRA	On-going

GOAL 1 Continued on next page

	<p>3. Provide information through publications, presentations, websites and other media on the impacts watershed development</p> <p>4. Disseminate news releases, radio spots and other media on the importance of shoreland buffers as nutrient and sediment sinks</p> <p><b>5. Hold 2 workshops and/or give presentations that focus on technical methods to reduce erosion and nutrient inputs to surface waters</b></p> <p>6. Provide information and incentives to shoreland property owners for responsible management of riparian lots.</p> <p><b>7. Present minimum of 3 educational programs about near-shore habitat and promote the use of native vegetation in restorations</b></p> <p>8. Provide assistance for projects aimed at evaluating shoreland restoration methods, erosion control, and near shore habitat recovery</p>	<p><b>LWCD, WDNR, Zoning, WL, UWEX, VCLRA</b></p> <p><b>LWCD, WDNR, Zoning, WL, UWEX, VCLRA</b></p> <p><b>LWCD, UWEX, WL</b></p> <p><b>LWCD, LDF-WR, UWEX, WDNR, WL, VCLRA</b></p> <p><b>LWCD, LDF-WR, UWEX, WDNR, WL, TFT, VCRLA</b></p> <p><b>LWCD, UWEX, WDNR, VCLRA</b></p>	<p>On-going</p> <p>On-going</p> <p>Biennial 1 workshop</p> <p>As-Needed</p> <p>Annual 3+ presentations</p> <p>As-Needed</p>
<p>G. Inform about best management practices</p>	<p>1. Provide information about conservation programming and educational resources via the website, news releases, farmers markets, etc.</p> <p>2. Promote responsible use of lawn fertilizers that are phosphorus free to protect water quality and reduce growth of algae or macrophytes</p> <p>3. Create an informative brochure for farmers about BMP's for their lands</p>	<p><b>LWCD</b></p> <p><b>All Partners</b></p> <p><b>LWCD, NRCS</b></p>	<p>On-going</p> <p>On-going</p> <p>2017 1 brochure</p>
<p>H. Inform about terrestrial invasive sps</p>	<p>1. Disseminate information about terrestrial invasive species ID, prevention, management, and control</p> <p>2. Post information about TIS on the LWCD website</p> <p><b>3. Hold a minimum of 2 public workshops about terrestrial invasive species</b></p> <p><b>4. Conduct 1 annual training to teach county road crews to recognize and report terrestrial invasive plants</b></p>	<p><b>LWCD, WHIP, schools</b></p> <p><b>LWCD</b></p> <p><b>LWCD, WHIP</b></p> <p><b>LWCD, Highway, WisDOT, WHIP</b></p>	<p>2015-2019</p> <p>2015-2019</p> <p>Biennial 2016-2018 2+ workshops</p> <p>Annual 1 road crew training</p>

GOAL 1 Continued on next page

I. Inform about aquatic invasive sps	<ol style="list-style-type: none"> <li>1. Maintain / improve a high public awareness level about the affects of aquatic invasive species on aquatic ecosystems</li> <li>2. Maintain an active working relationship with local media as a means to distribute invasive species information county wide</li> <li>3. <b>Hold a minimum of 2 education and training opportunities for the public that focus on AIS prevention methods, programs, and procedures</b></li> </ol>	<p>LWCD, WDNR, WL</p> <p>LWCD</p> <p>LWCD, WDNR, WL</p>	<p>On-going</p> <p>On-going</p> <p>Annual 2+ trainings</p>
J. Inform about Forests	<ol style="list-style-type: none"> <li>1. Coordinate education efforts to the public about forest management and best management practices for water quality</li> <li>2. Support sound forest management policies and practices with partners through the managed forest law program (MFL)</li> <li>3. Share data with the public and partners on forest fragmentation through maps and/or fact sheets</li> <li>4. Inform loggers, resource managers, private woodlot owners, elected officials, and others on the impacts of terrestrial invasive species to woodlands</li> </ol>	<p><b>UWEX, LWCD, WDNR, Forestry, Lumberjack RC&amp;D</b></p> <p><b>WDNR, LWCD</b></p>	<p>On-going</p> <p>On-going</p> <p>On-going</p> <p>On-going</p>
K. Communication Exchange	<ol style="list-style-type: none"> <li>1. Cooperate with partner agencies to reduce duplication of services</li> <li>2. Exchange information about projects, meetings, workshops, and other activities engaged in by the Land and Water Conservation Department with all partners</li> <li>3. Participate in the planning and implementation phases of the state and regional conferences</li> </ol>	<p><b>LWCD, all partners</b></p> <p><b>LWCD, all partners</b></p> <p><b>LWCD, WL, WDNR, UWEX, WLWCA</b></p>	<p>On-going</p> <p>On-going</p> <p>Annual Attend meetings</p>

GOAL 1 Continued on next page



	<p><b>4. Solicit working partnerships by project ideas aimed at teaching conservation ideals and natural resource protection</b></p> <p>5. Participate in regional planning work group aimed at the prioritization of grant funding for natural resource conservation practices</p>	<p>LWCD, TFT</p> <p>LWCC, LWCD, NRCS</p>	<p>Annual 1 meeting</p> <p>Annual 1 meeting</p>
<p>L. Miscellaneous Information</p>	<p>1. Disseminate information on lake management topics such as: grants, water level issues, project planning and implementation, watershed dynamics, etc.</p> <p>2. Educate the public about the affects of near shore boating practices</p> <p><b>3. Hold a minimum of 1 presentation about the importance of storm water mgmt practices</b> (rain gardens, etc)</p>	<p>LWCD, UWEX, WDNR, WL, VCLRA</p> <p>LWCD, WDNR</p> <p>LWCD, DATCP, UWEX, WDNR</p>	<p>On-Going</p> <p>On-Going</p> <p>Annual 1+ presentation</p>

END GOAL 1

**Goal 2: Protect aquatic and terrestrial environments from non-point source pollutants**  
*(Resource Concerns – Point/Non-point Source Pollution, Soil Erosion, Nutrient Loading, and Shoreline Development)*

Objective	Activities (Bold = Priorities)	Responsible Agencies	Tracking Measure
A. Monitor / Manage surface waters	<ol style="list-style-type: none"> <li><b>Conduct 3 lake inventories or field studies of buffer zones, aquatic vegetation, water quality, water quality monitoring, etc.</b></li> <li>Support efforts to monitor water levels and provide input to state protocol development</li> <li><b>Provide technical assistance and/or grant support to a minimum of 5 groups that initiate water resource protection projects</b></li> <li><b>Support a minimum of 3 comprehensive lake management planning efforts annually</b></li> <li>Support shoreland zoning ordinances, lakes classification, and land-use planning activity</li> <li>Support actions that encourage protection of shoreline habitats</li> <li>Confirm that nutrient management plans from operations are reviewed annually by the Natural Resource Conservation Service (NRCS)</li> </ol>	<p>LWCD, WDNR, Lake Orgs</p> <p>LWCD, WDNR</p> <p>LWCD, DATCP, NRCS, WDNR, VCLRA, WL, Towns</p> <p>LWCD, WDNR, UWEX, VCLRA</p> <p>LWCD, WDNR, UWEX, VCLRA</p> <p>LWCD, WDNR, UWEX, VCLRA</p> <p>LWCD, NRCS</p>	<p>Annual Assist w/ 3</p> <p>As-Needed</p> <p>Annual 5+ groups</p> <p>Annual 3+ efforts</p> <p>On-going</p> <p>On-going</p> <p>Annual Plans reviewed</p>
B. Administer cost-share program	<ol style="list-style-type: none"> <li>Obtain SWRM &amp; other funding for conservation projects</li> <li><b>Enroll 4 landowners into county or federal programs to address resource concerns</b></li> <li>Monitor past sites for compliance to county cost share operation &amp; maintenance contracts</li> </ol>	<p>LWCD, DATCP, WDNR</p> <p>LWCD, DATCP, NRCS</p> <p>LWCD</p>	<p>Annual Revenue received</p> <p>Annual 4 landowners</p> <p>Annual Monitor 10+ sites</p>

GOAL 2 Continued on next page

C. Manage runoff	<ol style="list-style-type: none"> <li>1. Design 3 technical plans that meet WI construction specifications, NRCS project standards, and WDNR requirements</li> <li>2. Establish buffer zones of native vegetation along riparian sites to reduce erosion on adjacent waterways</li> <li>3. Seek proper permits and apply interagency standards for best project designs.</li> <li>4. Assist landowners through mitigation plans for their land to comply with Zoning</li> <li>5. Respond to “red flag” sites and complaints in consultation with Zoning and other partners to address erosion concerns</li> <li>6. Estimate <b>P Load Reductions from Nonpoint Sources using the STEPL model in priority areas</b></li> </ol>	<p>LWCD, DATCP, NRCS, WDNR</p> <p>LWCD, DATCP</p> <p>LWCD, Zoning, WDNR</p> <p>LWCD, DATCP, Zoning</p> <p>LWCD, DATCP, Zoning, WDNR</p> <p>LWCD, DATCP, WDNR</p>	<p>Annual 3 plans</p> <p>Annual 2+ sites</p> <p>As Needed</p> <p>As Needed</p> <p>As Needed</p> <p>2018-2019 Estimates complete</p>
D. Manage croplands & pastures	<ol style="list-style-type: none"> <li>1. Contract with WDNR Wildlife Services to compensate eligible landowners when wildlife damage to commercial production crops has occurred (WDACP)</li> <li>2. Administer deer donation program funding in an effort to decrease wildlife crop damage.</li> <li>3. Implement conservation practices on croplands or pasturelands within the county</li> <li>4. Write grazing plans to encourage erosion protection and sustainability of pasturelands</li> </ol>	<p>LWCD, WDNR, APHIS</p> <p>LWCD, WDNR, APHIS</p> <p>NRCS, LWCD, DATCP</p> <p>LWCD, NRCS</p>	<p>Annual</p> <p>Annual 3 deer per year As Needed</p> <p>As Needed</p>

(GOAL 2 Continued on next page)

E. Manage groundwater	1. Inform the public that cost-share is available to properly abandon wells	LWCD, Zoning	As Needed
	2. Increase the number of proper well abandonments (minimum 1)	LWCD, Zoning, Public Health	Biennial 1+ well abandonment
	3. Support efforts to conduct regular monitoring and maintenance of septic systems	LWCD, Zoning	Annual 7,200 compliance checks
	4. Promote actions that decrease pathogen, hormone, antibiotic, and chemical pollutants from waste disposal and wastewater treatment discharge	LWCD, Zoning, Public Health, WDNR, UWEX	As Needed
F. Assess Groundwater	1. Seek funding to conduct a home drinking water testing program	LWCD, WDNR, Lumberjack RC&D	2020 Grant Application
	2. Coordinate home drinking water screening tests to detect any existing groundwater contamination	LWCD, UWEX, UWSP	2021 Testing Completed
	3. Compare the data collected in 2011 with data collected in this project to detect changes	LWCD, Public Health	2021
	4. Share assessment results with the public	LWCD	2021

END GOAL 2

**Goal 3: Protect aquatic, terrestrial, and wetland ecosystems from invasive species**  
*(Resource Concern – Aquatic and Terrestrial Invasive Species)*

<b>Objective</b>	<b>Activities</b> (Bold = Priorities)	<b>Responsible Agencies</b>	<b>Tracking Measure</b>
<b>I. Implement current Invasive Mngt Plans</b>	1. Support efforts to generate state and federal funding for prevention, management, and control programs	LWCC, LWCD, WHIP, WDNR, NRCS, WLWCA	On-going
	<b>2. Seek grant funding to support costs of the County IS Coordinator position</b>	LWCC, LWCD, WDNR	2015-2016; 2019 Grants applied for
	<b>3. Remain current on AIS/TIS issues by staying connected to information networks, organizations &amp; attend conferences</b>	LWCD	Annual Attend 5 +mtgs / 2+ trainings
	4. Remain active in planning, training, and education programs	LWCD, WDNR, WAL, UWEX	On-going
	5. Annual review / adjust strategic management plans	LWCD, WHIP, AIS Partnership	Annual Complete reviews
<b>II. Monitor Uplands</b>			
	1. Observe 2 county forests and adjacent lands annually for the presence / absence of invasive plants; report suspicious findings	Forestry, LWCD	Annual 2 forests monitored
	2. Follow-up site visits of all reported suspicious plant sightings	LWCD, Forestry	As Needed
<b>III. Monitor Wetlands</b>			
	1. Assist in the development of an invasive species monitoring protocol for wetlands	LWCD, WDNR, WWA	2016-2017 Protocol developed
	2. Observe a minimum of 2 wetlands annually for the presence / absence of invasive plants; report suspicious findings	Forestry, LWCD	Annual 2+ wetlands monitored
	3. Follow-up site visits of all reported suspicious plant sightings		As-Needed

GOAL 3 Continued on next page

IV. Implement the highway ROW Management Plan	A. Increase awareness & early detection	1. Conduct trainings (refer to Goal 1 - Educate)	LWCD, Highway, WHIP, WDNR	Annual
		2. Encourage volunteers to monitor for terrestrial invasive plants and animals	LWCD, WHIP, WDNR, Towns	Annual
		3. Observe roadsides and adjacent lands routinely for the presence / absence of invasive plants; report suspicious findings	LWCD, Highway	Annual Summary report
		4. Follow-up site visits of all reported suspicious plant sightings	LWCD, WHIP	As Needed
B. Prevention & Planning	1. <b>Hold meeting(s) to address management actions for known invasive sites; include prevention measures in plans</b>	LWCD, Highway, WHIP, WisDOT	Annual 1+ meeting	
		LWCD, WHIP, Highway, WisDOT	On-going	
		LWCD, Mapping	Annual Map update	
		LWCD	As Needed	
V. Implement the AIS Strategic Management Plan	A. AIS Public Awareness	1. Maintain / utilize the email list serve to broadcast current AIS information	LWCD	On-going
		2. Encourage school teachers to incorporate AIS curriculum into the classroom and beyond	LWCD, Schools, TFT, VCLRA	On-going
		3. Encourage AIS Partners to attend the annual WI Lakes Partnership Convention to learn about AIS	LWCD, WDNR, UWEX, WL, Towns	On-going
		4. Encourage citizens to conduct volunteer monitoring and protection programs	LWCD	On-going
		5. Provide current outreach materials to the public by creating / distributing brochures, fliers, etc	LWCD	On-going

(GOAL 3 Continued on next page)

B. Prevention & Early Detection				
	<ol style="list-style-type: none"> <li><b>1. Conduct trainings for citizen in-lake monitors and CB/CW programs (refer to Goal 1 - Educate)</b></li> </ol>	<ol style="list-style-type: none"> <li>Support funding efforts (grants) for various groups in their CB/CW and other monitoring programs</li> </ol>	<ol style="list-style-type: none"> <li>Support coordination efforts for the local CB/CW inspectors</li> </ol>	<ol style="list-style-type: none"> <li>Annual 2+ trainings</li> </ol>
			<ol style="list-style-type: none"> <li>Support coordination efforts for the local CB/CW inspectors</li> </ol>	<ol style="list-style-type: none"> <li>As Needed</li> </ol>
			<ol style="list-style-type: none"> <li>Assist walk-ins with identification of “suspect” plants</li> </ol>	<ol style="list-style-type: none"> <li>As Needed</li> </ol>
C. AIS Management				
			<ol style="list-style-type: none"> <li>Support efforts to manage current populations of AIS</li> </ol>	<ol style="list-style-type: none"> <li>As Needed</li> </ol>
			<ol style="list-style-type: none"> <li>Provide technical guidance to groups who need to begin management efforts (information, grant support)</li> </ol>	<ol style="list-style-type: none"> <li>As Needed</li> </ol>
			<ol style="list-style-type: none"> <li>Provide guidance to groups who wish to begin PL management by raising and distributing beetles</li> </ol>	<ol style="list-style-type: none"> <li>As Needed</li> </ol>

END GOAL 3

**Goal 4: Organize sites of concern within watersheds, wetlands, lakes, and forests**  
*(Resource Concern – Geographic Prioritization Project)*

<b>Objective</b>	<b>Activities (Bold = Priorities)</b>	<b>Responsible Agencies</b>	<b>Tracking Measure</b>
A. Identify / Clarify sites of concern	<ol style="list-style-type: none"> <li>1. Utilize LIDAR to map areas of forest fragmentation</li> <li>2. Utilize LIDAR to “type” wetlands based on ecological criteria outlined in St. Mary’s research project; create a map based on these wetland types</li> <li>3. Utilize WDNR website update of impaired waters to identify county lakes on the 303(d) list</li> <li>4. Utilize WDNR website to identify ORW/ERW sites</li> <li>5. Cross the 303(d) listed waters; the O/ERW listed waters; the healthy watersheds initiative data; and lakes classification data with findings from lake grant audit (refer to C below)</li> <li>6. Utilize lake grant audit data to identify Vilas County lakes in need of initial baseline data</li> </ol>	<p>LWCD, Mapping</p> <p>LWCD, Mapping, WWA, UWEX, St. Mary’s Univ</p> <p>LWCD, WDNR</p> <p>LWCD, WDNR</p> <p>LWCD, Zoning</p> <p>LWCD</p>	<p>2016 Map created</p> <p>2017 Map created</p> <p>2015; 2017; 2019 Lists generated</p> <p>2015; 2017; 2019 Lists generated</p> <p>2015 Cross List created</p> <p>2015 Lakes Identified</p>
B. Categorize sites of concern (Lakes & Wetlands)	<ol style="list-style-type: none"> <li>1. Create a list of Protection-based lakes (of high quality); Threatened lakes; and Remediation-based lakes (of impaired quality)</li> <li>2. Sort wetlands based on vulnerability to environmental degradation and other factors (development, endangered sps, recreational trails)</li> <li>3. Contact landowners that have been identified within a site of concern to inform them of appropriate county assistance programs</li> <li>4. Monitor most vulnerable wetlands for early or existing signs of degradation</li> <li>5. Conduct wetland restorations</li> </ol>	<p>LWCD</p> <p>LWCD</p> <p>LWCD</p> <p>LWCD, WDNR, WWA</p> <p>LWCD, WWA, WDNR</p>	<p>2016; 2018; 2020 Prioritized lakes Lists generated</p> <p>2017 Prioritized wetlands List generated</p> <p>2017; 2019 Landowners notified</p> <p>2017 – 2018 Wetlands monitored</p> <p>2020+</p>

GOAL 4 Continued of next page  
 End GOAL 4



Vilas County Land and Water Resource Management Plan – 2015-2019 Work Plan

<b>Phase 1 Lakes &amp; Watersheds Project</b>				
<b>C. Audit existing lake grants &amp; plans</b>	1. Compile information about existing lake management plans funded by WDNR planning grants	<b>LWCD</b>		2014-2015 Info compiled
	2. Conduct a spatial analysis to compile a list of lake organizations in need of forging ahead to lake plan implementation	<b>LWCD, Mapping</b>		2015
	3. Contact and support lake organizations in efforts to implement existing lake management plans; 3 minimum	<b>LWCD</b>		2015 3 groups/year
	4. ID "at risk" lakes having no existing management plans; encourage those groups to move forward with lake planning initiatives	<b>LWCD</b>		2015
	5. Review existing lake plans to evaluate if the EPA's 9 key elements of a watershed plan are met	<b>LWCD</b>		2015 Reviews complete
<b>Phase 2 Lakes &amp; Watersheds Project</b>				
<b>D. Rank Watershed Health</b>	1. Create <i>Vilas County only</i> watershed maps with existing Healthy Watershed Initiative Project data	<b>LWCD, Mapping</b>		2015 Maps created
	2. Utilize LIDAR to identify areas of potential soil erosion at watershed level throughout the county; begin by calculating K factors for each watershed (soil erodibility)	<b>LWCD, Mapping</b>		2016-2017 Maps created 15+ K Calculations
	3. Cross the DNR Watershed Initiative Project data with (D1+D2) above	<b>LWCD, Mapping</b>		2016 Maps created
	4. Create a system to rank overall health status of watersheds throughout the county	<b>LWCD</b>		2016-2017 Health rankings
<b>Phase 3 Lakes &amp; Watersheds Project</b>				
<b>E. Share Health Status Information</b>	1. Utilize phase 1 and 2 information findings to create lake health report cards for the public (realtors, buyers, consultants, etc) to use on our website	<b>LWCD</b>		2017-2018
	2. Research potential database collection & management programs to create online display of report card status information (google document, Access, etc)	<b>LWCD, IT Dept</b>		2017
	3. Input all lake status report card information into database			2017-2018 100+ cards created
	4. Share information from all phases of this project with other counties, professionals, and lake groups	<b>LWCD, WDNR</b>		2019

**Goal 5: Attend to state and local conservation funding and policy issues**  
*(Resource Concern – A/I)*

<b>Objectives</b>		<b>Activities</b> ( <b>Bold = Priorities</b> )	<b>Responsible Agencies</b>	<b>Tracking Measure</b>
A. Participate in regional and state conservation orgs	<ol style="list-style-type: none"> <li>Two representatives from Vilas County attend meetings of the North Central Land &amp; Water Conservation Association (NCLWCA)</li> <li>Support Vilas County representatives elected to serve on the WI Land &amp; Water Conservation Association (WLWCA) board</li> <li><b>Attend annual WLWCA conference and vote for resolutions moving forward to the state legislature</b></li> </ol>	LWCC, LWCD	On-going Meeting Attendance	
		LWCC, LWCD, WLWCA	As Needed	
		LWCC, LWCD	Annual Meeting Attendance	
B. Establish a working relationship with area legislators and partners				
C. Protect and fund natural resources and conservation programs	<ol style="list-style-type: none"> <li>Invite area legislators to LWCC meetings and/or regional association meetings for communication exchanges</li> <li>Review and follow through on partner agreement documents, contracts, or MOUs</li> </ol>	LWCC, NCLWCA	On-going	
		All Partners	On-going	
END GOAL 5	<ol style="list-style-type: none"> <li>Move resolutions to the county board that support policy to protect all natural resources</li> <li>Support efforts to protect local wetland areas from potentially harmful activities on the landscape (rec trails, development, invasives, etc)</li> <li>Create and move resolutions forward to the county board that support funding of county conservation staff</li> </ol>	LWCC, LWCD	As Needed	
		LWCC, LWCD, Towns, Zoning, WWA	As Needed	
		LWCC, LWCD	As Needed	

# TOOLS, EDUCATION, REGULATION, AND EVALUATION

## Chapter 5

### A. MANAGEMENT TOOLS AND PROPOSED PROJECT SUMMARIES

#### HEALTHY WATERSHEDS INITIATIVE MAPPING

In 2013, Wisconsin DNR partnered with U.S. EPA to develop a model-based assessment tool for all the watersheds in the state. This tool ranks each watershed based on many aspects of watershed condition, including water quality, hydrology, habitat, and biological condition. The assessment results are a *modeled prediction* of both overall watershed health and vulnerability, which are presented in a series of maps and ranking scores. The results are not measured through actual monitoring, and thus should only be used as a *broad-level screening tool* in a *comparative fashion*—a way to compare one watershed to others in the county, but not as an indication of whether a watershed is ‘good’ or ‘bad’. For instance, if all watersheds in the county were in relatively good shape for a specific metric, they are still rank ordered from 1 to 100; therefore, even those ranked the lowest could actually be in pretty good shape for that metric. And vice versa, if there is a metric that all watersheds are pretty poor on, some watersheds will be ranked high & some low, even though none of them are particularly ‘good’.

#### **Aquatic Ecosystem Health Assessment** (Map 12)

The Aquatic Ecosystem Health Assessment is made up of four main categories: Hydrologic Condition, Habitat Condition/Geomorphology, Water Quality and Biological Condition. Within these categories are a variety of metrics, which are shown below:

##### *Hydrologic Condition*

- Total ecochange

##### *Habitat Condition/Geomorphology*

- Patch size

- Road crossing density

- Stream habitat index

- Percent Reed canary grass

- Percent Streams that are canals/ditches

##### *Water Quality*

- Nitrate-and nitrite

- Total phosphorus

- Suspended sediment

- Lake clarity

##### *Biological Condition*

- Macroinvertebrate Index of Biotic Integrity

### **Watershed Vulnerability Assessment (Map 13)**

The Watershed Vulnerability Assessment is made up of three main categories: Climate Change, Land Use Change, and Water Use. Each of these three categories was developed using specific metrics, as shown below:

#### *Climate Change*

Runoff Change

#### *Total Nitrogen Change*

Total Phosphorus Change

Total Suspended Sediments Change

#### *Land Use Change*

Landcover difference

#### *Water Use*

Groundwater Wells

Groundwater Dependent Ecosystems index (GDE Index)

### **Health And Vulnerability Overlay (Map 14)**

One of the most powerful ways to use these rankings as a screening-level tool is to overlay the “Health” scores with the “Vulnerability” scores. This helps pinpoint two useful things:

- Those watersheds that are **most healthy** but also **most vulnerable** to future degradation, shown in blue on the map. These are watersheds that could be considered for **protection priorities**, to prevent future degradation and maintain their high quality.
- Those watersheds that are **less healthy** but are **not very vulnerable** to future degradation, shown in red on the map. These watersheds may be more stable over time, so restoration actions taken here may have a better chance at maintenance and success into the future. These watersheds could be considered for **restoration priorities**.

The types of protection or restoration that might be most appropriate for each watershed can be explored by viewing the individual metric scores for the watersheds, which will help predict what the problem issues may be.

In Vilas County, two individual metric scores will be followed more closely—landscape condition and aquatic invasives.

### **Landscape Condition (Map 15)**

Percent of land in natural landcover

Percent of land in natural landcover in the “Active River Area” (ARA)

Percent of wetlands remaining

Percent Hubs & Corridors (NEF)

### **Aquatic Invasives (Map 16)**

Eurasian Water Milfoil

Curly Leaf Pondweed

Zebra Mussel

Spiny Waterflea

The purpose of the Wisconsin Integrated Assessment of Watershed Health (the Assessment) is to identify healthy watersheds and characterize relative watershed health across the state (and county) to guide future protection initiatives. A healthy watershed has the structure and function in place to support healthy aquatic ecosystems. It is characterized as having all or most of these key components: intact and functioning headwaters, wetlands, floodplains, riparian corridors, biotic refugia, instream and lake habitat, and biotic communities; and natural vegetation in the landscape, hydrology (e.g., range of in stream flows and lake levels), sediment transport and fluvial geomorphology, and disturbance regimes expected for its location.

We will utilize the existing healthy watersheds initiative maps to further refine areas identified within Vilas County that are in priority need of protection against pollution and other threats.

See all 5 maps at the end of this chapter.

## **GEOGRAPHIC PRIORITIZATION MAPPING**

To focus grant and human resources to the areas within the county in most need of protection or in areas of greatest potential for pollution, a geographic prioritization mapping project will be initiated. A ranked prioritization listing or color coded map will be developed and created so that areas of greatest need of assistance will be identified. Factors to consider when creating the priority list will be: overall watershed health, soil type, soil attenuation potential (erodibility factor K), existing land uses, topography, potential for groundwater contamination, and classification status of the nearest waterway(s). Another important component to consider when prioritizing sites will be to remove personal, political and social biases and concentrate only on addressing the needs of the natural resources. Once the initial prioritization is complete, LWCD staff will further refine the listing as needed to address the most pressing of resource issues.

## **PHOSPHORUS LOAD REDUCTION ESTIMATE PROJECT**

Vilas County Land and Water Conservation staff will utilize the modeling procedure STEPL (Spreadsheet Tool for Estimating Pollutant Load) to estimate phosphorus load reductions on the landscape over a given year. Agricultural activities are at a minimum in the county, thus it is not necessary to utilize more complex modeling procedures to determine reductions in P loads. In addition, agricultural data is sometimes considered proprietary, therefore, accessibility to sufficient information required by more detailed models is difficult to obtain. Considering this, the WDNR recommends that models be run using approximate land use conditions in critical areas to estimate the reductions received from various best management practices that are installed. Simple landscape models such as STEPL require generalized data such as estimated land cover composition.

STEPL is a regression-based model with simple algorithms that calculate sediment and nutrient loads from different land uses and the load reductions that would result from the implementation of various best management practices (BMPs). Sources of input for the STEPL model include: Drainage area and land use, hydrologic soil group, metrological data from precipitation stations,

known point sources, septic stems, universal soil loss equation parameters as per land use. Outputs for the model include annual phosphorus / sediment loads, and BMP efficiencies. The BMP's listed here are good tools when estimating P Load reductions with the STEPL model: Alum Treatments, Bioretention, Contour/Strip Cropping, Diversions, Dry Retention, Fencing, Filter Strips, Gully Stabilization, Infiltration Basins, Swale, Streambank Stabilization, Separation Basin, Terracing, and Waste Storage Facilities.

## **COUNTY LAKES AND WATERSHEDS PROJECT**

**Phase 1** of the Lakes and Watersheds Project is currently underway and involves an audit and compilation of existing lake management plans and data that were completed by lake organizations with the aid of WDNR lake planning grant funds. Once this information is compiled, county staff will be able to focus their limited resources on groups that require additional assistance when moving lake management plans forward to implementation phases.

**Phase 2** will involve ranking the health of watersheds throughout the county. LiDAR will be used to create a map which will identify areas most likely to erode in the county based on slopes, soil types, and current land use. By using the web soil survey method, county staff will also run calculations to determine “K”, the soil erodibility factor for each of the county’s watersheds. The K calculation method is available on the WDNR website within the adaptive management technical handbook. The existing watershed status available from the Healthy Watershed Initiative Project will be crossed with K factors and LiDAR data to assist the county in assigning overall watershed health ranks. **Phase 3**, the final phase of the Lakes and Watersheds Project, the county will share outcomes of lake and watershed rankings (from phases 1&2) with the public. County staff will create lake health status report cards that will be placed on our website for benefit of the public. The county will also share the entire project experience with other counties and professionals whom would like to accomplish similar goals in their communities.

### **Abandonment of Wells**

To address groundwater protection, management, and education, Vilas Conservation staff will initiate an increase in the number of properly abandoned wells in the county. The primary purpose in doing so will be to protect county residents and visitors from potential groundwater contamination issues. Staff will seek assistance from the County Zoning and Public Health Departments as needed to implement the voluntary program with an educational emphasis for residents.

### **Wetland Assessment Project**

The condition of our lakes, rivers, streams, wetlands and soils are impacted by activities within the drainage boundaries, and many water resource problems are the result of the cumulative effects of multiple upstream impacts, largely due to changes in hydrology.

With support from the Wisconsin Wetland Association and from St. Mary’s University of Minnesota, a project will be initiated using new methods to assess wetland functions at a watershed scale. The wetland assessment will help Vilas County evaluate and decide where wetlands do, *or could*, provide significant benefits to the community, and will assist us in using watershed-scale wetland planning to improve local land use decision-making. The first steps in a water-shed wide approach will be to identify the wetlands within the county that are *most*

beneficial to protect, preserve, or restore. This information will lend a valuable starting point for Vilas County to embark on a future Watershed Scale Wetland Planning project. A watershed scale wetland planning effort will help communities align the services wetlands provide with the problems people want to solve.

## **CLEAN BOATS / CLEAN WATERS PROGRAM**

Many lake organizations throughout Vilas County regard the Clean Boats, Clean Waters (CBCW) program as the best defense against the spread of aquatic invasive species. Although initially intended to be sustainable primarily by citizen volunteers, the program has evolved to be heavily dependent on paying trained individuals to provide CBCW inspection services. The WDNR CBCW grant program provides easy access to funding for lake organizations to pay for CBCW services, but does not facilitate the actual securing of services. The role of Vilas County is to develop, coordinate and support cost effective and efficient methods for lake organizations to purchase CBCW services. A program initiated in Vilas County in 2010 whereby area lake organizations obtain WDNR grant funding to contract with UW Oshkosh for CBCW services performed by college students housed in Vilas County is an example of how assistance can be provided by this department to local lake organizations. The CBCW program will be continued into the future in Vilas County to make certain that lake users are being educated on the importance of checking watercraft and trailers for the presence of aquatic plants and/or invasive species.

## **B. INFORMATION AND EDUCATION STRATEGY**

Information and education strategies play a fundamental role in this plan and in Vilas County's conservation programs. Educational opportunities for youth and property owners need to remain available to create and maintain a heightened awareness of the importance of resource protection and enhancement. Many of the objectives in the work plan emphasize educational strategies like Land & Water Department website posts, presentation creation, trainings and workshops that are offered to the public, working with the local media, participation in WLWCA sponsored youth programs, and distribution of informational brochures. As work plan implementation proceeds the LWCD will adapt how to create additional information and education strategies as needs arise.

There are other general activities that are regularly performed by LWCD staff such as: partnerships with local and State conservation associations to coordinate a multi-County and/or State approach to conservation programs; planning and coordination of the public information and educational programs of the LWCC, such as hosting poster contest, planning and directing of the annual WLWCA Youth Conservation Camp, and recognition of outstanding conservation stewards and educators; attend and participate in Lumberjack Resource Conservation and Development (RC&D) council meetings; attend and participate in North Central Land and Water Conservation Association (NCLWCA) area meetings; serve on the Wisconsin Land and Water Conservation Association (WLWCA) board of directors; serve in an advisory capacity for Vilas County Lakes & Rivers Association (VCLRA); participate on the planning committee for

Wisconsin Lakes (WL) annual statewide convention; and attend Wisconsin Land and Water Conservation Association (WLWCA) annual conference.

### **C. PERFORMANCE STANDARDS AND PROHIBITIONS**

Wisconsin adopted revised NR 151 administrative rules in 2011 (Attachment C), which set statewide performance standards and prohibitions for all Wisconsin farms. All Wisconsin farmers must be in compliance with these standards and prohibitions. Vilas County offers reimbursement cost-share funding to landowners to help off-set the total cost of implementing practices on the land that moves them toward compliance with these standards. Some state and local programs may require compliance whether or not cost-share funds are available. A listing of the standards is as follows:

#### **Agricultural Performance Standards**

- Sheet, rill and wind erosion: All cropped fields shall meet the tolerable (T) soil erosion rate established for that soil.
- Tillage setback: No tillage operations may be conducted within 5 feet of the top of the channel of surface waters.
- Phosphorus index: Croplands, pastures, and winter grazing areas shall average a phosphorus index of 6 or less over the accounting period and may not exceed a phosphorus index of 12 in any individual year within the accounting period.
- Manure storage facilities: All new, substantially altered, or abandoned manure storage facilities shall be constructed, maintained or abandoned in accordance with accepted standards. Failing and leaking existing facilities posing an imminent threat to public health or fish and aquatic life or violate groundwater standards shall be upgraded or replaced.
- Process wastewater handling: There may be no significant discharge of process wastewater to waters of the state.
- Clean water diversions: Runoff from agricultural buildings and fields shall be diverted away from contacting feedlots, manure storage areas and barnyards located within water quality management areas (300 feet from a stream or 1,000 feet from a lake or areas susceptible to groundwater contamination).
- Nutrient management: Agricultural operations applying nutrients to agricultural fields shall do so according to a nutrient management plan.

#### **Manure Management Prohibitions**

- No overflow of manure storage facilities.
- No unconfined manure piles in a water quality management area.
- No direct runoff from feedlots or stored manure into state waters.



- No unlimited livestock access to waters of the state in locations where high concentrations of animals prevent the maintenance of adequate or self-sustaining vegetative cover.

### **Implementation Strategy**

County land and water resource management plans are the local mechanism to implement NR 151 performance standards and prohibitions. Through Wisconsin Act 27, the Wisconsin Legislature amended State statutes to allow LWCCs to develop implementation strategies for addressing local water quality priorities related to controlling erosion, sedimentation, and nonpoint source water pollution.

Vilas County is not known as an agricultural location within the state. However, there are a number of very small hobby farms, seed potato, and cranberry farming operations that do reside here, and because of its large number of lakes and streams, they likely reside within water quality management areas. Farmer education will continue to be the primary tool used to achieve erosion control standards in the county.

One-on-one contacts with landowners who request technical assistance will be the most common method used to promote soil conservation in Vilas County. As part of the work plan, county staff will create and distribute an updated educational brochure that outlines best management practices most suited to reduce soil loss and water runoff. In addition, we will distribute the WDNR document *Wisconsin's Runoff Management: What a Farmer Needs to Know*.

All Cranberry operators in Vilas County are in compliance with the nutrient management plan standard. The county partners up with the local NRCS office to determine if these operators remain in compliance each year.

Animal waste is generally not a pollution concern due to the relatively low number and size of livestock operations. Small scale horse, goat, and cattle operations do exist and the county does offer priority cost-share assist to landowners so they may be in compliance with manure management prohibitions.

In accordance to Wisconsin's Working Lands Initiative, revision to the county Farmland Preservation Plan (FPP) is currently underway. Conservation plans, which plan individual crop fields to the tolerable soil loss rate or "T", are prepared for participants in the Farmland Preservation Program. Historically, participation in the tax incentive program has been very low to non-existent in Vilas County. Participation in the Farmland Preservation Tax incentive program is voluntary and completed through an individual agreement process. During the recent revision to the Farmland Preservation Plan, there have been a number of eligible small-scale producers identified in Vilas County. The Land and Water Conservation Department will continue to manage future agreements for the Farmland Preservation Program.

Agricultural land management is usually the focus of Land and Water Resource Management plans because soil erosion is an important resource concern. Vilas County's largest crop is timber. Implementation of forestry BMPs is a land based resource focus as shown in Work Plan Goal 1: Increase the public's level of natural resource knowledge and stewardship. The Forestry

Department administers the Vilas County Forest Comprehensive Land Use Plan 2009 – 2029 (§28.11, WI Stats.), which addresses erosion on County forest lands within Vilas County. The WDNR oversees creation of private forest management plans when the landowners enroll their land in the Managed Forest Law to receive a low pre-set property tax rate per acre. Forestry as a land use covers 81 percent of Vilas County. The LWCD will concentrate on the water quality management areas, and highly erodible lands draining to outstanding and exceptional resource waters in Vilas County. These shoreland residential and other residential areas consist of less than 2 percent of the land in Vilas County.

A priority farm is one that is found to be non-compliant with the State prohibitions and performance standards. Criteria for ranking priority farms will be based on geographical location in water quality management areas (300 feet from a stream or 1,000 feet from a lake or areas susceptible to groundwater contamination).

For the **priority farm strategy**, a general approach to providing information to all farms will occur with Work Plan activities. If a farm has a significant water quality problem, we will work with the landowner to bring them into compliance. Enforcement procedures are described in later in this chapter.

#### Cost-share program funding to minimize nonpoint source pollution

The program is designed to conserve Wisconsin's soil and water resources, reduce soil erosion, prevent nonpoint source pollution and enhance water quality. The LWCD offers a cost-share program for County landowners through ATCP 50 grant funding. The primary emphasis of the program continues to be implementation of shoreland stabilization practices and restoration of native vegetation in order to reestablish riparian buffer areas, and to reduce soil erosion by installing erosion control practices. Healthy buffer zones reduce nonpoint source pollution and impede soil erosion.

#### **Non-Agricultural Performance Standards**

The beach monitoring program created by the Vilas County Public Health Department, in response to public health and other environmental concerns over the levels of total coliform bacteria and *E. coli* in area surface water, is still in existence today. Work on this program is accomplished by lake associations/districts, public health officials, UW-Oshkosh and others to make sure our recreational beaches are safe for users. Protocols have been developed to close heavily infected beaches and bring them back to levels safe for members of the public.

Vilas County finds that construction site erosion and uncontrolled stormwater runoff from land disturbing and land development activities can have significant adverse impacts upon local water resources and the health, safety and general welfare of the community, and can diminish the public enjoyment and use of natural resources.

#### Land Disturbance Activities Subject to Stormwater Management and Erosion Control:

All activities directly related to the planting, growing, and harvesting of agricultural crops are not considered land disturbance activities under this section. Land disturbance activities to the shoreland zone are regulated by the Vilas County Zoning and Shoreland Protection Ordinance.

Vilas County also requires new businesses to address erosion control and stormwater management through Administrative Review permits and Conditional Use permits.

Standards for Stormwater Management and Erosion Control:

Stormwater runoff, soil erosion, siltation, or sedimentation from all land disturbing and development activities shall meet standards in NR 151 and 216 and COMM 60 and 20-21, Wis. Adm. Code and/or shall be controlled in accordance with Technical Guidelines as developed by the U.S. Department of Agriculture, Natural Resources Conservation Service, or the Wisconsin Department of Natural Resources.

**D. ENFORCEMENT PROCESS**

It is by LWCC recommendation that the Ag and Non-Ag Performance Standards continue to be implemented on a voluntary basis in Vilas County.

If a site is identified within the county that is in need of practice implementation and the landowner has not voluntarily contacted the Land & Water Conservation Department, the county conservationist will send a letter to landowner informing them of the issues and their options to come into compliance with the state standards. If the landowner chooses not to move ahead with any practice implementation activity within 6 months of the first letter, a second letter to the landowner will be sent and copied to the county Corporation Counsel. If no activity is commenced within 3 months of the second letter, then Vilas County will communicate with DNR about enforcement action.

**E. REGULATIONS**

Vilas County has relied on the following State regulations for the protection of natural resources:

- Department of Natural Resources – Chapter 30, Wisconsin Statutes – Navigable Waters
- Department of Natural Resources – Administrative Code NR102 – Water Quality Standards for Wisconsin Surface Waters
- Department of Natural Resources – Administrative Code NR103 – Water Quality Standards for Wetlands
- Department of Natural Resources – Wisconsin Pollution Discharge Elimination System Permits
- Department of Natural Resources – Administrative Code NR151, Performance Standards
- Department of Natural Resources – Administration Code NR216, Storm water Discharge Permits and Construction Site Erosion Control
- Department of Natural Resources – Chapter 29.601, Wisconsin Statutes – Noxious Substances
- Department of Agriculture, Trade, & Consumer Protection – ATPC 50, Soil and Water Resource Management Program

Local regulations used to protect natural resources in Vilas County are:

- Vilas County Subdivision Code
- Vilas County Zoning and Shoreland Protection Ordinances
- Vilas County Lakes Classification Zoning

Vilas County has initiated the following policy to improve the distribution of conservation practice implementation on the land:

- **Conservation Cost Share Program Policy – Tier Level Practices**  
Each of the cost-sharable conservation practices available to landowners are placed into one of three tier levels of grant funding that are defined in the policy (see details in **Attachment D**).

## **F. ASSESSMENT, MONITORING, AND EVALUATION**

Monitoring and evaluation of specific resource issues can be accomplished in many different ways as described below:

### **Work Plan Progress Assessment**

The Vilas County LWRM plan is intended to be a working document that will be reviewed by the LWCC and LWCD to track progress in accomplishing the goals and actions of the Work Plan. An annual assessment of the Land and Water Resource Management Work Plan will be implemented by both quantifiable and qualifying means to determine the overall accomplishments or specific successes of a given objective or activity. Because program accomplishments do not always lend themselves to specific, measurable units or result, there will be observations made and conclusions drawn. Quantifiable tracking measures will be assessed annually and in instances of longer term activities or programs that do not dictate a means to measure numerically (On-Going or As-Needed), activity progress will be measured by a qualifying means. For example as time progresses, some of the objectives will be illustrated by a percentage (%) of the total goal met, the specific number of trained volunteers, or whether or not a program was successful by certain behaviors occurring (or NOT occurring) within the public sector.

The annual report required by DATCP will also be completed and will help to serve as a guide for assessment of work plan progress.

### **Performance Standards and Prohibitions Monitoring and Evaluation**

A voluntary approach will continue to be utilized to achieve erosion control standards in Vilas County. One-on-one contacts with landowners and operators who request technical assistance is the most common method used to promote soil conservation in Vilas County.

Conservation plans, which plan individual crop fields to the tolerable soil loss rate or "T", are prepared for participants in the Farmland Preservation Program. Participation is through voluntary 10-25 year individual agreements, because there is minimal agricultural zoning in Vilas County. The Vilas County Land and Water Conservation Department manages agreements for Farmland Preservation Program.

### **Water Quality & Lake Monitoring**

Citizen volunteers watch our lakes through participation in the Citizen Lake Monitoring Network (CLMN) program. Volunteers continue to collect valuable lake chemistry and water clarity data, and presence/absence data related to aquatic invasive species and native macrophyte growth within the county's lake ecosystems. Vilas County supports volunteer monitoring efforts and will continue to encourage lake associations, lake property owners, and lake users to participate in the CLMN program. Vilas County will continue to pursue Lake Planning and Protection Grants to fund lake monitoring projects.

### **Phosphorus Loading & Nutrient Management**

Phosphorus loading can adversely affect water quality by promoting excessive plant and algae growth. In order to reduce nutrient loading by animal waste, any newly installed barnyard systems will be evaluated to ensure compliance with STEPL calculations, which will require annual phosphorus runoff reductions.

In cooperation with DATCP and NRCS, Vilas County will monitor and measure nutrient management progress by tracking nutrient management plan checklists for the acreage with the planner (NRCS), and by annual tracking of nutrient management plans through NRCS.

### **Conservation Compliance Checks**

As required within the operation and maintenance portion of the contract agreement signed between a landowner and Vilas County, a landowner must maintain installed practices for a minimum of ten years following project completion and distribution of reimbursement funding. County staff will run compliance checks and monitor practices annually on a minimum of 10 previously implemented conservation practices and maintain records of such in project files.

In addition, DATCP and NRCS conduct annual engineering and conservation planning spotchecks to ensure compliance with all applicable technical standards.

All the methods outlines above can relate to each other since phosphorus loading will be noticed when monitoring water quality. If there is phosphorus loading, then a nutrient management plan can be developed. If citizen lake monitoring and evaluation is not working, then more volunteers will be necessary to increase water quality testing. Nutrient management will be accomplished by monitoring steps 1 thru 5.

## **G. COORDINATION**

The LWCD staff seeks cooperation from and works closely with a diverse group of agencies, associations, and organizations involved in resource management and protection in Vilas County. These agencies and groups include: United States Department of Agriculture – Farm Service Agency (FSA), Natural Resource Conservation Service (NRCS), Animal and Plant Health Inspection Service – Wildlife Services (APHIS-WS), and United States Forest Service (USFS); Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP); Wisconsin Department of Natural Resources (WDNR) staff such as Water Resources Management Specialists, Fisheries Biologists, Water Regulations and Zoning Specialists, Water Program Management staff, Watershed Management Staff, Invasive Species Management staff,

and Forestry staff; Army Corp of Engineers, University of Wisconsin – Extension; Vilas County Forestry, Mapping, Public Health, Zoning, Solid Waste, and Highway Departments; individual Vilas County Lake Organizations; Vilas County Lakes Association, and Wisconsin Lakes (WL).

Each agency, organization, association, and individual has its individual resource issues, programs, and plans; but cooperatively we can work together for the greater good of Vilas County's land and water resources.

# GLOSSARY

## Chapter 6

**303(d) Waters** – Also called **List of Impaired Waters**. This list identifies waters that are not meeting water quality standards, including both water quality criteria for specific substances or their designated uses. It is used as the basis for development of Total Maximum Daily Loads (TMDLs) under the provisions of section 303(d)(1)(C) of the Clean Water Act, U.S. Environmental Protection Agency (EPA). The EPA requires that the DNR update its list every 2 years.

**Animal Waste Management Program** – This regulatory program, administered by the DNR via NR 243, seeks to identify and correct animal waste-related water quality problems.

**Animal and Plant Health Inspection Service – Wildlife Services (APHIS-WS)** – Part of USDA, APHIS-WS provides assistance to manage animal damage.

**ATCP 50** – The chapter of Wisconsin’s Administrative Code that implements the Land and Water Resource Management Program as described in Chapter 92 of the WI Statutes. It identifies those conservation practices that may be used to meet performance standards.

**Best Management Practices (BMPs)** – The most effective conservation practice or combination of conservation practices for reducing nonpoint source pollution to acceptable levels.

**Chapter 92** – Portion of Wisconsin Statutes outlining the soil and water conservation, agricultural shoreland management, and animal waste management laws and policies of the State.

**Conservation Plan** – A record of decisions and intentions made by land users regarding the conservation of the soil, water and related natural resources of a particular unit of land.

**Conservation Reserve Enhancement Program (CREP)** – An add-on to the CRP program, which expands and builds on CRP’s success in certain areas of the State.

**Conservation Reserve Program (CRP)** – A provision of the federal Farm Bill that takes eligible cropland out of production and puts it into grass or tree cover for 10-15 years.

**Cooperator** – A landowner or operator who is working with, or has signed a cooperative agreement with, a County LWCC.

**Cooperative Weed Management Area (CWMA)** – a non-profit group of volunteers working together to plan and implement weed management projects. In Vilas and Oneida counties, this group is called WHIP – the Wisconsin Headwaters Invasives Partnership.

**County Conservationist** – County Land and Water Conservation Department head, responsible for implementing programs assigned to the LWCD and for supervising LWCD staff.

**Critical Sites** – Those sites that are significant sources of nonpoint source pollution upon which best management practices shall be implemented as described in s. 281.65(4)(g) 8.am., WI stats.

**Crop Consultants** – Independent Crop Consultants provide services to growers in integrated crop and farm management programs, working directly with farmers, and advising them in areas

such as watershed management, integrated nutrient and pest management, and animal waste management. Their primary purpose is implementing scientific and technological advances to enhance environmental sustainability and profitability on clients' farms.

**Department of Administration (DOA)** – The State agency responsible for establishing the comprehensive planning grant program.

**Department of Commerce (COMM)** – The State agency responsible for Statewide standards for erosion control at building sites, and for private on-site wastewater treatment systems.

**Department of Agriculture, Trade, and Consumer Protection (DATCP)** – The State agency responsible for establishing Statewide soil and water conservation policies and administering the State's soil and water conservation programs. The DATCP administers State cost-sharing funds for a variety of LWCC operations, including support for staff, materials and conservation practices. Referred to in the LWRM plan guidelines as the “department”.

**Department of Natural Resources (DNR)** – The State agency responsible for managing State owned lands and protecting public waters. DNR also administers programs to regulate, guide and assist LWCCs, LWCDs and individual land users in managing land, water, fish and wildlife. The DNR administers State cost-sharing funds for priority watershed projects, Targeted Runoff Management (TRM) grants, and Urban Nonpoint Source Construction and Planning grants.

**District Conservationist (DC)** – NRCS employee responsible for administering federal conservation programs at the local level.

**Environmental Protection Agency (EPA)** – The agency of the federal government responsible for carrying out the nation's pollution control laws. It provides technical and financial assistance to reduce and control air, water, and land pollution.

**Environmental Quality Incentives Program (EQIP)** – Federal program to provide technical and cost-sharing assistance to landowners for conservation practices that provide water quality protection.

**Farm Service Agency (FSA)** – USDA agency that administers agricultural assistance programs including price supports, production controls, and conservation cost sharing.

**Farmland Preservation Program (FPP)** – A DATCP land-use program under Chapter 91, Wisconsin Statutes, that helps preserve farmland through local planning and zoning, promotes soil and water conservation, and provides State tax relief to participating landowners.

**Forestry** – The Forestry, Recreation, and Land Department of Vilas County. This term used in the Work Plan.

**Geographic Information System (GIS)** – A computerized system of maps and layers of data about land including soils, land cover, topography, field boundaries, roads and streams. Such geographically based data layers improve the ability to analyze complex data for decision making.

**Health** – The Vilas County Public Health department. This term used in the Work Plan.

**Highway** – The Highway Department of Vilas County. This term used in the Work Plan.



**Impaired Waters List** Same as the 303(d) list.

**Land and Water Conservation Board (LWCB)** – This Statewide board is composed of three local elected officials, four appointed by the Governor (one shall be a resident of a city with a population of 50,000 or more, one shall represent a governmental unit involved in river management, one shall be a farmer, and one shall be a member of a charitable corporation, charitable association or charitable trust) and leaders from DNR, DATCP, and DOA. The LWCB oversees the approval of County land and water management plans (s.92.04, stats.).

**Land and Water Resource Management Plan (LWRM plan)** – A locally developed and implemented multi-year strategic plan with an emphasis on partnerships and program integration. The plan includes a resource assessment, identifies the applicable performance standards and related control of pollution from nonpoint sources, identifies a multi-year description of planned activities, establishes a progress tracking system, and describes an approach for coordinating information and implementation programs with other local, State and federal agencies, communities and organization (s. ATCP 50.12).

**Land and Water Conservation Committee (LWCC)** – The unit of County government empowered, by Chapter 92 of the Wisconsin Statutes, to conserve and protect the County’s soil, water and related natural resources. Referred to in the LWRM guidelines as the “committee”.

**Land and Water Conservation Department (LWCD)** – The department of County government responsible for administering the conservation programs and policies of the Land and Water Conservation Committee.

**Light Detection and Ranging (LiDAR)** – A remote sensing technology that measures distance by illuminating a target with a laser and analyzing the reflected light

**List of Impaired Waters** – Also called **303(d) Waters**. This list identifies waters that are not meeting water quality standards, including both water quality criteria for specific substances or the designated uses. It is used as the basis for development of Total Maximum Daily Loads (TMDLs) under the provisions of section 303(d)(1)(C) of the Clean Water Act, U.S. Environmental Protection Agency (EPA). The EPA requires that the DNR update its list every 2 years.

**Mapping** – The Vilas County Mapping Department. This term is used in the Work Plan.

**Natural Resources Conservation Service (NRCS)** – Part of USDA, NRCS provides soil survey, conservation planning and technical assistance to local land users.

**Nonpoint Source Pollution (NPS)** – Pollution from many small or diffuse urban and rural sources. Livestock waste finding its way into a stream and causing water pollution is an example of non-point source pollution.

**Nonpoint Source Pollution Abatement Program** – A DNR water quality program under Chapters 120 and 281, Wisconsin Statutes, that provides technical assistance and cost-sharing to landowners to develop and maintain management practices to prevent or reduce nonpoint source water pollution in designated watersheds.

**Northwoods Land Trust** – The Northwoods Land Trust is a non-profit, tax-exempt conservation organization headquartered in Eagle River, WI. They promote conservation of

private shorelands, woodlands, wetlands, and other natural resources, as public benefits for present and future generations.

**NR 151** – DNR’s administrative code that establishes runoff pollution performance standards for non-agricultural facilities and transportation facilities and performance standards and prohibitions for agricultural facilities and practices designed to meet water quality standards.

**Nutrient Management Plan** – The Nutrient Management Plan means any of the following: (a) A plan required under s. ATCP 50.04 (3) or 50.62 (5) (f). (b) A farm nutrient plan prepared or approved, for a landowner, by a qualified nutrient management planner.

**ORW/ERW** – DNR classifies streams as Outstanding Resource Waters (ORW) and Exceptional Resource Waters (ERW) as listed in NR 102.10 and NR102.11. ORW waters have excellent water quality and high-quality fisheries and do not receive wastewater discharges. ERW waters have excellent water quality and valued fisheries but may already receive wastewater discharges.

**Priority Farms** – Farms identified by the County for having excessive runoff from soil erosion and/or manure resulting in existing or potential water quality problems.

**RC&D** – Resource Conservation and Development. Vilas County is one of 10 counties in the Lumberjack Council. This term used in the Work Plan.

**Shall** – The term “shall” in the guideline represents components of a LWRM plan that are required in law and rule.

**Soil and Water Resource Management Program (SWRM)** – DATCP program that provides counties with funds to hire and support Land and Water Conservation Department staff and to assist land users in implementing DATCP conservation programs (ATCP 50).

**Soil Loss Tolerance (“T”)** – Erosion rate in tons per acre per year of soil that a field could lose and still maintain productivity.

**Soil Survey** – NRCS conducts the National Cooperative Soil Survey and publishes soil survey reports. Soils data is designed to evaluate the potential of the soil and management needed for maximum food and fiber production.

**Solid Waste** – The Solid Waste Department of Vilas County. This term is used in the Work Plan.

**Spreadsheet Tool for Estimating Pollutant Load (STEPL)** – a management tool to estimate phosphorus load reductions on the landscape over a given year

**United States Department of Agriculture (USDA)** – Branch of federal government with responsibilities in the areas of food production, inspection, and storage. Agencies with resource conservation programs and responsibilities, such as FSA, NRCS, APHIS-WS, and Forest Service and others are agencies of the USDA.

**University of Wisconsin-Extension (UWEX)** – The outreach of the University of Wisconsin system responsible for formal and informal educational programs throughout the State.

**Vilas County Lakes & Rivers Association (VCLRA)** – A non-profit group dedicated to protecting lakes and other surface waters in Vilas County. This term is used in the Work Plan.

**V.C. 2014** – A fact that is sourced to Vilas County Zoning and Planning Department.

**Water Quality Management Area (WQMA)** – The area within 1,000 feet from the ordinary high water mark of navigable waters that consist of a lake, pond or flowage, except that, for a navigable water that is a glacial pothole lake, the term means the area within 1,000 feet from the high water mark of the lake; the area within 300 feet from the ordinary high water mark of navigable waters that consist of a river or stream; and a site that is susceptible to groundwater contamination, or that has the potential to be a direct conduit for contamination to reach groundwater.

**Watershed** – The geographic area that drains to a particular river, stream, or water body providing its water supply.

**Wetlands Reserve Program (WRP)** – A provision of the federal Farm Bill that compensates landowners for voluntarily restoring and protecting wetlands on their property.

**Wildlife Habitat Incentives Program (WHIP)** – Federal program to help improve wildlife habitat on private lands.

**Wisconsin Headwaters Invasive Partnership (WHIP)** – a multi-agency cooperative weed management unit serving both Vilas and Oneida Counties to educate and protect against invasive terrestrial plants

**Wisconsin Lakes (WL)** – A state non-profit agency working to protect the lakes of Wisconsin through sound policy and legislation

**Wisconsin Land and Water Conservation Association (WLWCA)** – Membership organization that represents the State's 72 County Land and Water Conservation Committees and Departments

**Wisconsin Wetlands Association (WWA)** – A non-profit agency working to protect Wisconsin's Wetlands

**Work Plan** – A 5-year plan of federal/State/local agency activities based upon Citizens Advisory Committee, and Technical Advisor Committee developed goals, and objectives.

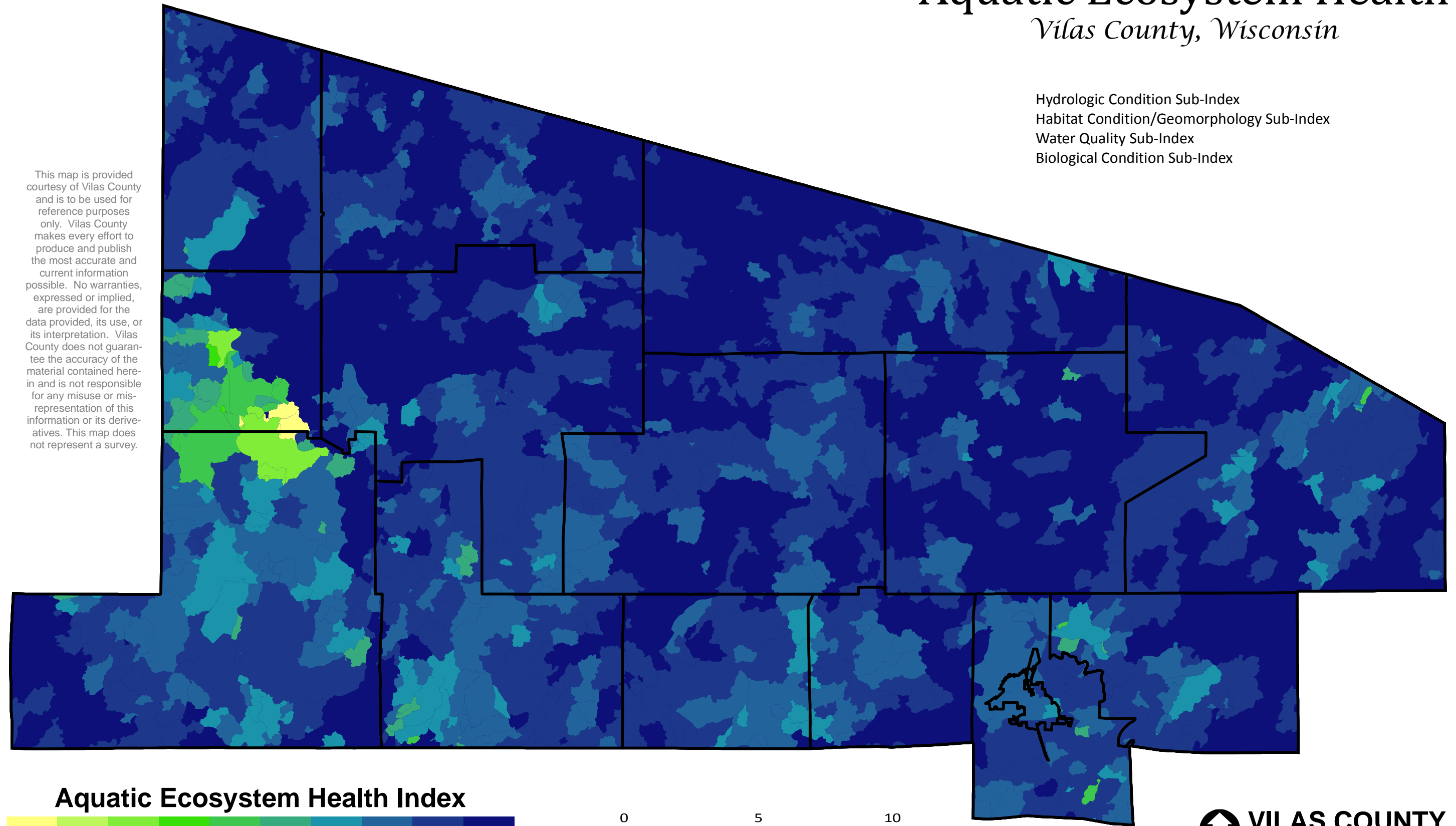
**Zoning** – The Vilas County Zoning and Planning Department. This term used in the Work Plan.

# Aquatic Ecosystem Health

*Vilas County, Wisconsin*

Hydrologic Condition Sub-Index  
Habitat Condition/Geomorphology Sub-Index  
Water Quality Sub-Index  
Biological Condition Sub-Index

This map is provided courtesy of Vilas County and is to be used for reference purposes only. Vilas County makes every effort to produce and publish the most accurate and current information possible. No warranties, expressed or implied, are provided for the data provided, its use, or its interpretation. Vilas County does not guarantee the accuracy of the material contained herein and is not responsible for any misuse or misrepresentation of this information or its derivatives. This map does not represent a survey.



## Aquatic Ecosystem Health Index



Low

High

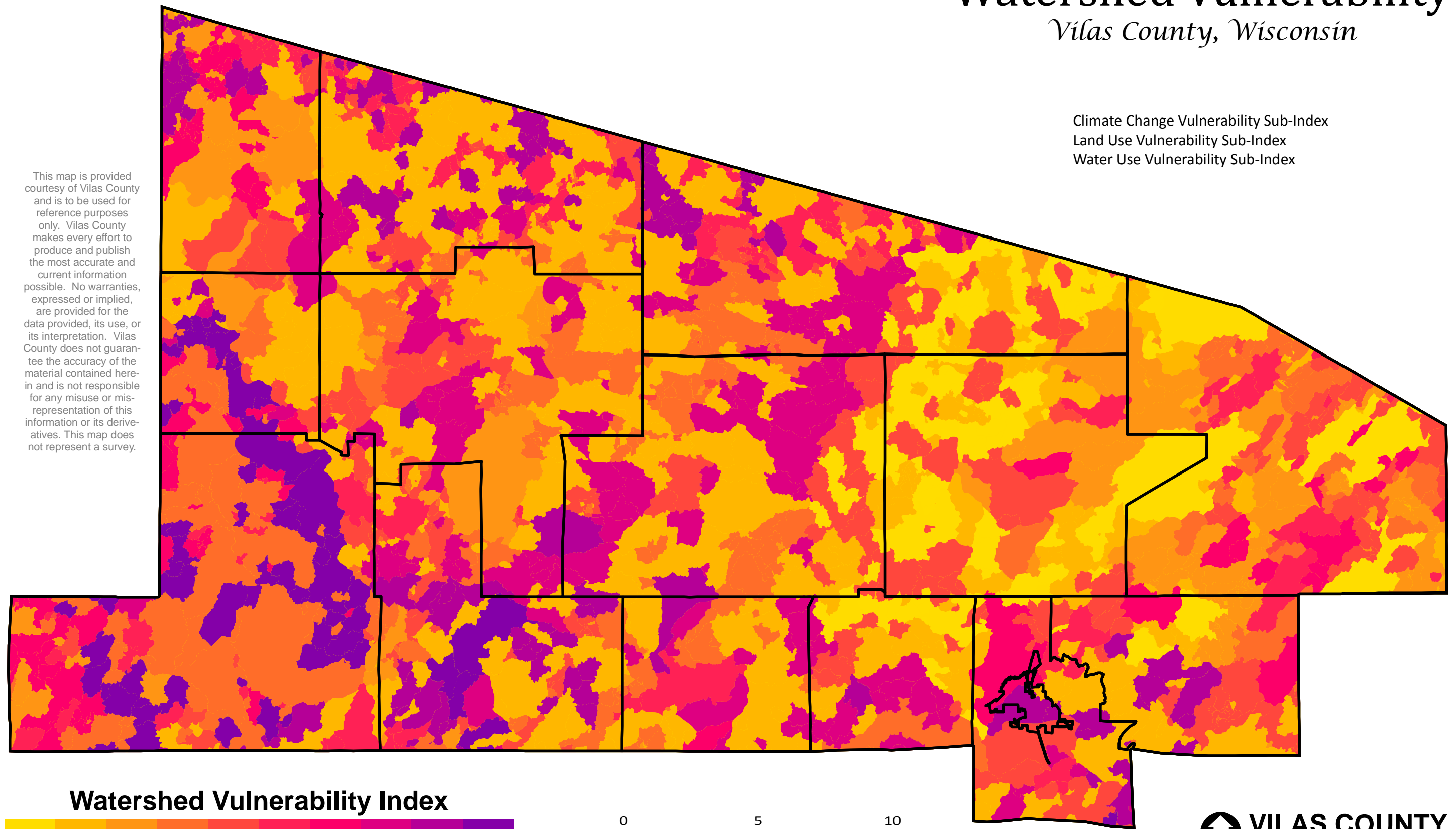


# Watershed Vulnerability

*Vilas County, Wisconsin*

Climate Change Vulnerability Sub-Index  
Land Use Vulnerability Sub-Index  
Water Use Vulnerability Sub-Index

This map is provided courtesy of Vilas County and is to be used for reference purposes only. Vilas County makes every effort to produce and publish the most accurate and current information possible. No warranties, expressed or implied, are provided for the data provided, its use, or its interpretation. Vilas County does not guarantee the accuracy of the material contained herein and is not responsible for any misuse or misrepresentation of this information or its derivatives. This map does not represent a survey.

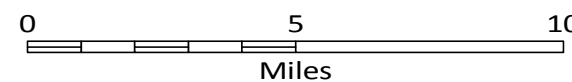


## Watershed Vulnerability Index



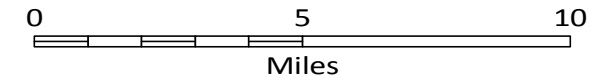
Low

High

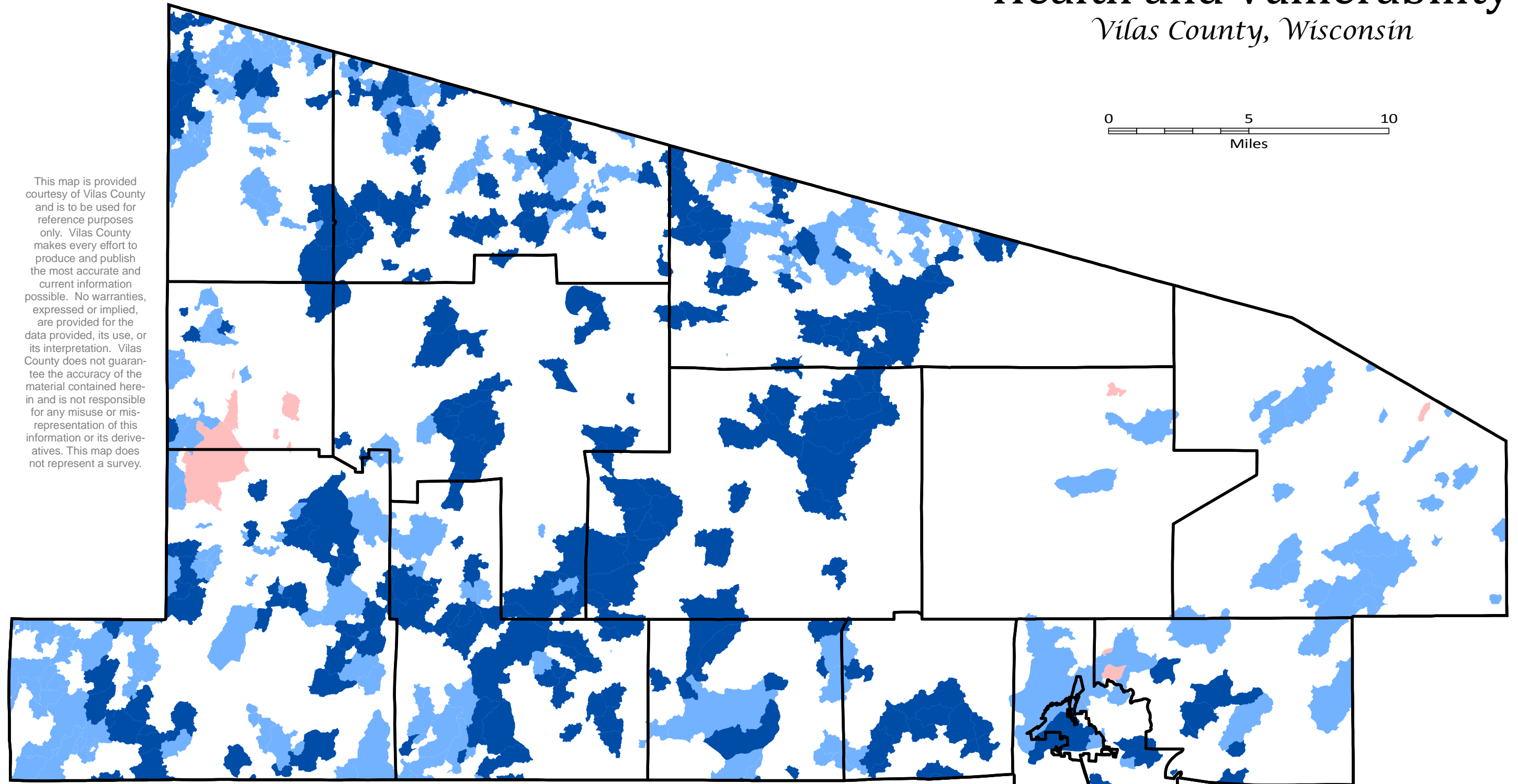


# Health and Vulnerability



*Vilas County, Wisconsin*




This map is provided courtesy of Vilas County and is to be used for reference purposes only. Vilas County makes every effort to produce and publish the most accurate and current information possible. No warranties, expressed or implied, are provided for the data provided, its use, or its interpretation. Vilas County does not guarantee the accuracy of the material contained herein and is not responsible for any misuse or misrepresentation of this information or its derivatives. This map does not represent a survey.

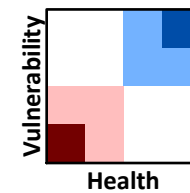


### Protection Priority

-  25% Most Healthy & 25% Most Vulnerable
-  50% Most Healthy & 50% Most Vulnerable

### Restoration Priority

-  25% Least Healthy & 25% Least Vulnerable
-  50% Least Healthy & 50% Least Vulnerable

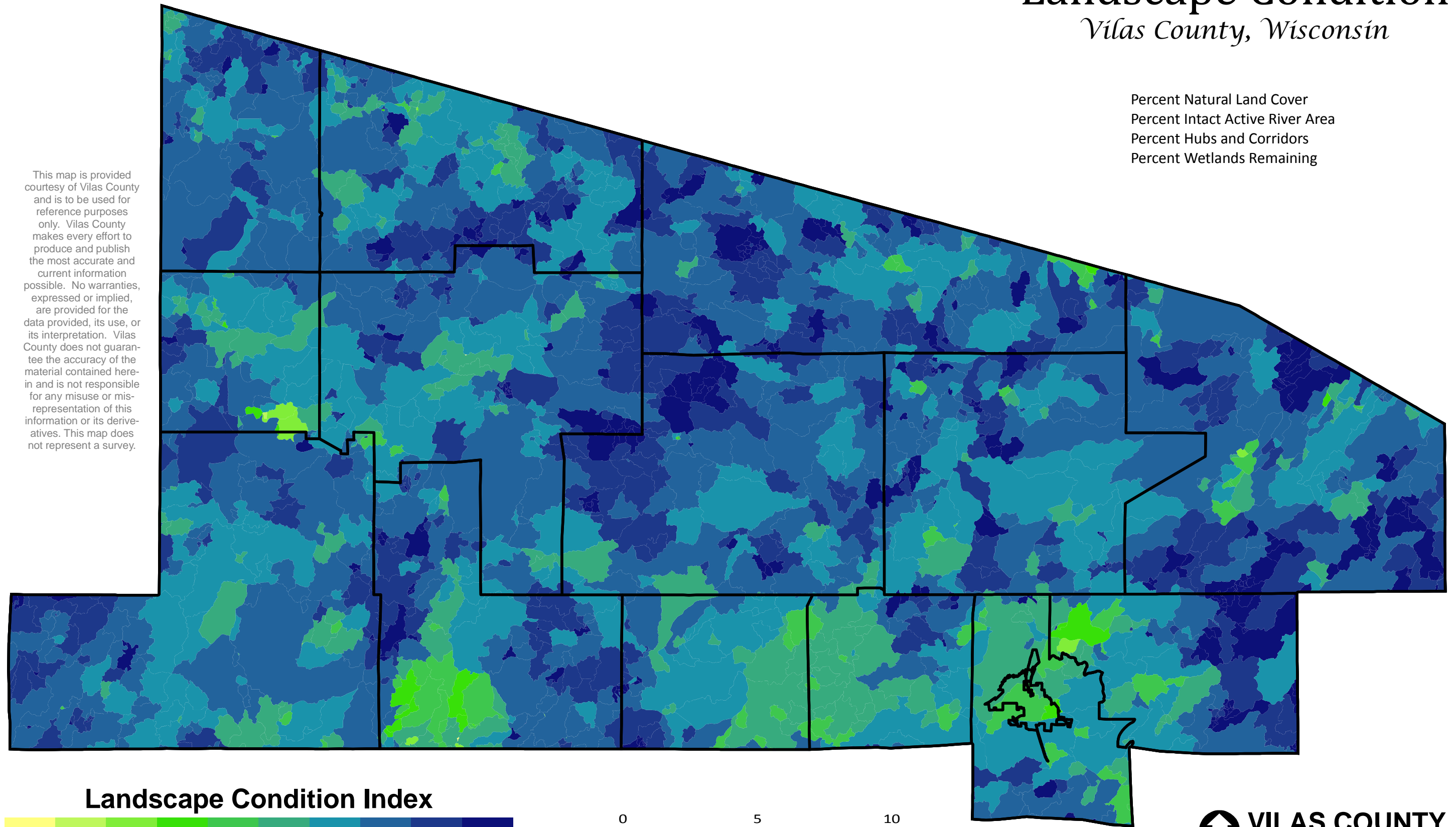


# Landscape Condition

*Vilas County, Wisconsin*

Percent Natural Land Cover  
Percent Intact Active River Area  
Percent Hubs and Corridors  
Percent Wetlands Remaining

This map is provided courtesy of Vilas County and is to be used for reference purposes only. Vilas County makes every effort to produce and publish the most accurate and current information possible. No warranties, expressed or implied, are provided for the data provided, its use, or its interpretation. Vilas County does not guarantee the accuracy of the material contained herein and is not responsible for any misuse or misrepresentation of this information or its derivatives. This map does not represent a survey.

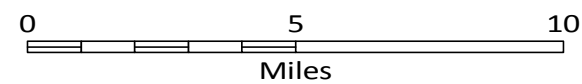


## Landscape Condition Index



Low

High

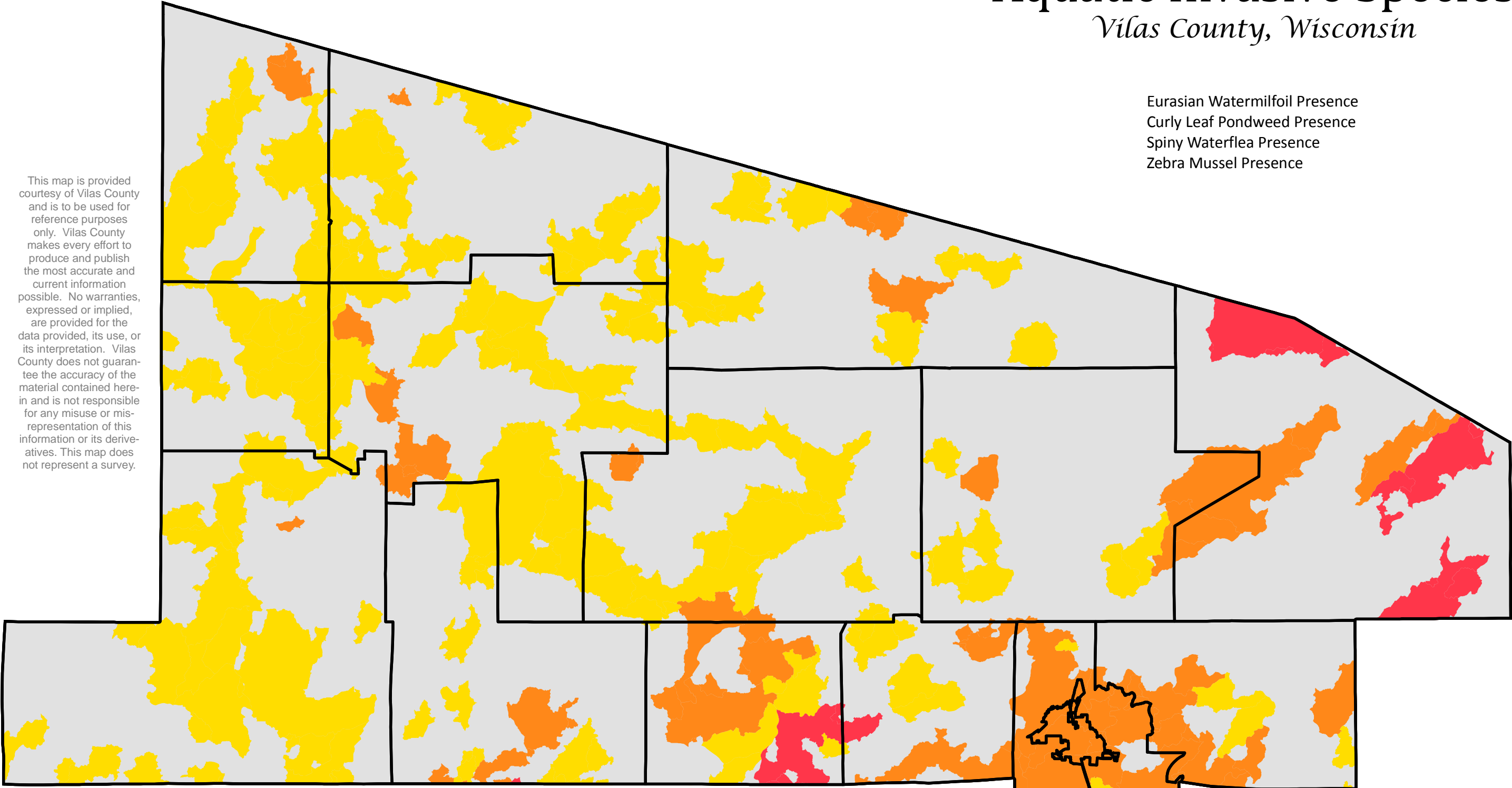


# Aquatic Invasive Species

*Vilas County, Wisconsin*

- Eurasian Watermilfoil Presence
- Curly Leaf Pondweed Presence
- Spiny Waterflea Presence
- Zebra Mussel Presence

This map is provided courtesy of Vilas County and is to be used for reference purposes only. Vilas County makes every effort to produce and publish the most accurate and current information possible. No warranties, expressed or implied, are provided for the data provided, its use, or its interpretation. Vilas County does not guarantee the accuracy of the material contained herein and is not responsible for any misuse or misrepresentation of this information or its derivatives. This map does not represent a survey.

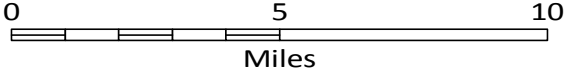


## Aquatic Invasive Species Index



Low

High



Miles



# **ATTACHMENT A**

---

## **Public Hearing Notice**

Vilas Co. Land + Water Conservation Dept

9825

STATE OF WISCONSIN }  
Vilas County } ss.

(Two Weeks, 8/20-8/27/14)  
NOTICE IS HEREBY GIVEN that a public hearing will be held pursuant to Wis. Stat. §92.10(6)(c) on Thursday, September 4, 2014 at 9:00 a.m. in Conference Room #2 of the Vilas County Courthouse, 330 Court Street, Eagle River, Wisconsin, 54521. The hearing concerns the Vilas County 2015-2024 Land and Water Resource Management Plan and will be held before the Vilas County Land & Water Conservation Committee. Written and oral comments on the draft plan will be taken at that time.  
According to the provisions outlined in Wis. Stat. §92.10(6) and Wis. Admin. Code §ATCP 50.12, 50.30(3), Vilas County supports a locally led process that enhances decision-making during their current revision of the 2015-2024 Land and Water Resource Management Plan. The County is in the process of identifying land and water resource concerns and prioritizing work tasks into a five year work plan. Copies of the draft plan are available upon request at the Vilas County Land and Water Conservation office, 330 Court Street, Eagle River, Wisconsin from 8 a.m.-4 p.m. Monday through Friday.  
For additional information regarding this public hearing, please contact the Land & Water Conservation Department of Vilas County at (715) 479-3682. All interested parties will be heard.  
9825  
WNAXLP

Kurt L. Krueger, being duly sworn, deposes and says that he (she) is an authorized representative of the Vilas County News-Review and The Three Lakes News, a weekly newspaper published at Eagle River, the seat of government of said county, and that an advertisement of which the annexed is a true copy, taken from said paper, was published therein on

August 20, 2014  
August 27, 2014

(Signed) Kurt J. Krueger  
Publisher (Title)

Subscribed and sworn to before me this 27th day of August, 2014  
Terry L. Posto  
Notary Public, Vilas County, Wisconsin

My Commission expires August 6, 2017.  
34 lines, one insertion @ .6603 per line \$ 22.45  
34 lines, 1 insertion @ .5216 per line \$ 17.73  
Office Fee \$ 1.00  
Total \$ 41.18

Terry L. Posto  
Notary Public  
State of Wisconsin  
(Seal)

**NOTICE OF PUBLIC HEARING - Class II**

NOTICE IS HEREBY GIVEN that a public hearing will be held pursuant to Wis. Stat. §92.10(6)(c) on Thursday, September 4, 2014 at 9:00 a.m. in Conference Room #2 of the Vilas County Courthouse, 330 Court Street, Eagle River, Wisconsin, 54521. The hearing concerns the Vilas County 2015-2024 Land and Water Resource Management Plan and will be held before the Vilas County Land & Water Conservation Committee. Written and oral comments on the draft plan will be taken at that time.

According to the provisions outlined in Wis. Stat. §92.10(6) and Wis. Admin. Code §ATCP 50.12, 50.30(3), Vilas County supports a locally led process that enhances decision-making during their current revision of the 2015 - 2024 Land and Water Resource Management Plan. The County is in the process of identifying land and water resource concerns and prioritizing work tasks into a five year work plan. Copies of the draft plan are available upon request at the Vilas County Land and Water Conservation office, 330 Court Street, Eagle River, Wisconsin from 8:00 am - 4:00 pm Monday through Friday.

For additional information regarding this public hearing, please contact the Land & Water Conservation Department of Vilas County at (715) 479-3682. All interested parties will be heard.

## **ATTACHMENT B**

---

### **Nutrient Management Conservation Practice Standard**

# Wisconsin Conservation Planning Technical Note WI-1

---

## Companion Document to NRCS FOTG Standard 590, Nutrient Management September 2007

### Introduction

#### Definition of Nutrient Management

Managing the amount, source, placement, form, and timing of the application of nutrients and soil amendments.

#### Purpose

Nutrient management planning is an important and yet oftentimes cumbersome process. This Technical Note has been developed in order to provide guidance for nutrient management planning in addition to NRCS Field Office Technical Guide (FOTG) Standard 590.

**NRCS, Field Office Technical Guide (FOTG), Section IV, Conservation Practice Technical Standard 590, Nutrient Management**, provides specific criteria for nutrient management planners (section V). It identifies the necessary components of a nutrient management plan (section VII), and lists criteria for operation and maintenance of the practice (section VIII). Federal, state, and local laws may provide additional requirements and guidance. Please be aware that the Wisconsin Conservation Planning Technical Note WI-1 is the companion document to NRCS FOTG Standard 590 and includes criteria that are required where specified.

Periodic updates to material contained in this technical note may occur. To find the most current information for developing nutrient management plans, use Snap Plus nutrient management software from <http://www.snapplus.net/> developed by the UW Madison, Soil Science Department and available free of charge. This nutrient management planning tool will allow nutrient management planners to use the most current application rate guidelines found in UWEX publication A2809 and the most current manure book values for estimating manure production and nutrient availability. Snap Plus will also stay current and highlight soil map units that are susceptible to leaching N. These soils are found in Appendix 1 of this technical note and will be changing to numerical map units as county soil surveys are updated.

#### **This technical note provides detailed guidance on the following:**

- Part I:** Minimum Requirements for a Nutrient Management Plan
- Part II:** Items of Benefit for Nutrient Management Planning
- Part III:** Determining Manure Nutrient Credits
- Part IV:** DNR Regional Offices and Contacts
- Appendix 1:** Soils List with High Potential for Nitrate Leaching to Groundwater
- Appendix 2:** Certified Laboratories
- Appendix 3:** Nutrient Management for Wisconsin Cranberry Production

# Conservation Planning Technical Note WI-1

---

## Appendix 2 Certified Soil Test Laboratories

The following laboratories have been approved as of the publication date of this document.

UW Soil & Plant Analysis Laboratory  
5711 Mineral Point Road  
Madison, WI 53705  
Ph: (608) 262-4364

UW Soil & Forage Laboratory  
8396 Yellowstone Drive  
Marshfield, WI 54449  
Ph: (715) 387-2523

Rock River Laboratory  
710 Commerce Drive  
P. O. Box 169  
Watertown, WI 53094  
Ph: (920) 261-0446

Dairyland Laboratories  
217 E. Main Street  
Arcadia, WI 54612  
Ph: (608) 323-2123

Agsources Soil & Forage Laboratory  
106 N. Cecil Street  
Bonduel, WI 54107  
Ph: (715) 758-2178

A&L Great Lakes Laboratories  
3505 Conestoga Drive  
Fort Wayne, IN 46808  
Ph: (260) 483-4759

Mowers Soil Testing Plus, Inc.  
117 E. Main Street  
Toulon, IL 61483  
Ph: (309) 286-2761

## Conservation Planning Technical Note WI-1

---

### Appendix 3

#### Nutrient Management for Wisconsin Cranberry Production

This appendix to the Wisconsin Conservation Planning Technical Note WI-1 (“the technical note”) has been developed in order to provide guidance for nutrient management planning on cranberry production systems. A cranberry nutrient management plan that meets the criteria included in this appendix should satisfy the requirements of the Wisconsin NRCS Nutrient Management Conservation Practice Technical Standard (“the 590 standard”) and the technical note. Reference is made to particular sections of the 590 standard and the technical note, where special attention may be needed.

The guidance and instructions included in this appendix are in addition to those found in the 590 standard. Implementation of a plan developed based upon the guidance included in this document must be in accordance with the 590 standard. Federal, state, and local laws may provide additional requirements.

**This appendix provides detailed guidance on the following:**

- Section I: Criteria Unique to Cranberry Nutrient Management Planning
- Section II: Cranberry Nutrient Management Tables
- Section III: Cranberry Nutrient Management Plan Outline and Optional Forms

## Section I: Criteria Unique to Cranberry Nutrient Management Planning

### I. General

- A. Cranberry nutrient management planning shall be based on plant tissue analysis. Plant tissue analysis shall be performed annually, on each individual nutrient management unit, in accordance with *Cranberry Tissue Testing for Producing Beds in North America* (Extension publication EM-8610). Tissue analysis should be performed by a reputable laboratory—preferably one that participates in the North American Proficiency Testing Program. A minimum of one sample shall be collected per management unit per year. In addition, a total of at least one sample per 5 acres of cranberry beds, within each nutrient management unit, shall be collected every 4 years. (For example, on a 25-acre nutrient management unit, collect at least one tissue sample every year and a total of at least 5 samples over a 4-year period.) Refer to EM-8610 and “How to Take a Cranberry Tissue Sample,” (Teryl R. Roper, Professor and Extension Fruit Crops Specialist, UW-Madison, 2006) for further guidance.
- B. Soil fertility analysis should also be considered in cranberry nutrient management planning. Soil samples must be analyzed by an approved Wisconsin laboratory. (Refer to Appendix 2 of this technical note for contact information.) Consider collecting a total of at least one composite sample per 5 acres of producing cranberry beds, within each nutrient management unit, every 4 years. Refer to *Sampling Soils for Testing* (UW-Extension publication A2100) and “How to Take a Cranberry Soil Sample,” (Teryl R. Roper, Professor and Extension Fruit Crops Specialist, UW-Madison, 2006) for further guidance.
- C. Additional considerations in cranberry nutrient management planning should include monitoring and observation of plant vigor and appearance, production history, and grower experience, in addition to the considerations described in the Extension publications referenced in this document.
- D. Ensure that application equipment is properly calibrated.
- E. Applications of nutrient and soil amendments should not be made when soil temperatures are low (<50 deg. F) or fields are saturated with water.
- F. Applications of nutrient and soil amendments should be rescheduled when predicted weather conditions are likely to transport these amendments to non-target areas (*i.e.* precipitation events, planned irrigation events, frost protection events, etc.). The nutrient management plan shall document mitigation practices to be implemented when rescheduling is not possible.
- G. An analysis of the water chemistry of irrigation and/or flood water should be considered when the conservation planning resource assessment has identified that water chemistry may significantly influence nutrient management by altering soil acidity and/or resulting in the application of significant quantities of plant nutrients.
- H. Efforts should be made to limit the detachment and transport of vegetation and soil materials (*i.e.* material that is removed or disturbed in the processes of bed

renovation/construction or managed “floods”), which may result in the deposition of these materials into surface waters.

## **II. Soil Acidity**

- A. Maintain soil pH at or below 6.0, where practical. The “target pH” is 5.6 for mineral soils and 5.4 for organic soils, as identified in *Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin* (UWEX publication A2809). Note circumstances where the difference between the actual soil pH and the target pH is greater than 0.5, and describe procedures utilized to adjust pH, if such efforts are made.
- B. Annual sulfur applications should not exceed 500 lbs elemental S per acre.
- C. Individual sulfur applications should not exceed 150 lbs elemental S per acre.

## **III. Nitrogen (for producing beds)**

- A. Nitrogen management strategies shall be in accordance with *Nitrogen for Bearing Cranberries in North America* (Extension publication EM-8741). Note: Hybrid varieties, such as Stevens and Pilgrim, may benefit from tissue-N concentrations up to 1.3% (2006 Wisconsin Cranberry School Proceedings, Teryl Roper, UW-Extension).
- B. Ammonium or urea forms of nitrogen fertilizer should be used.
- C. Individual nitrogen applications should not exceed 20 lbs/ac.
- D. Identify and implement water quality mitigation practices for beds where soil pH is greater than 5.5 and 70 lbs or more of nitrogen fertilizer are applied per acre per year.
- E. Annual applications of fertilizer containing N should be made using a minimum of three passes, unless total planned applications for the season do not exceed 20 lbs N per acre.
- F. Applications of fertilizer containing N should be timed to coincide with peak crop demand (active growth).

## **IV. Phosphorous (for producing beds)**

- A. Phosphorous management strategies shall be in accordance with *Phosphorous for Bearing Cranberries in North America* (UW-Extension publication, Nov. 2004).
- B. Annual phosphorous applications shall not exceed 20 lbs actual P per acre (~45 lbs P<sub>2</sub>O<sub>5</sub> per acre), unless the need for additional annual P is documented by plant tissue analysis or other considerations as outlined in *Phosphorous for Bearing Cranberries in North America*.
- C. Develop a fertilizer reduction strategy where planned, annual applications of phosphorous fertilizer exceed 20 lbs actual P per acre (~45 lbs P<sub>2</sub>O<sub>5</sub> per acre), on producing beds; tissue analysis demonstrates that nutrient concentrations are within or exceed recommended levels; and no deficiency of phosphorous has been demonstrated



through soil fertility analysis. Cranberry tissue nutrient content guidelines for producing beds and soil test interpretation categories for phosphorous are summarized in Section II of this appendix.

- D. Applications of fertilizer containing P should be timed to coincide with peak crop demand (hook to fruit set). Multiple, lighter applications of fertilizer containing P are preferred over fewer, heavier applications.

#### **V. Potassium (for producing beds)**

- A. The goal of potassium fertility management should be to maintain plant tissue concentrations within the recommended range (refer to EM-8610 or Section II).
- B. Large doses of potassium fertilizer have the potential to disrupt the balance of available cations (positively-charged ions) in the soil. Because of this, individual applications of fertilizer containing potassium should not exceed ~62 lbs actual K per acre (75 lbs K<sub>2</sub>O per acre).
- C. Multiple, lighter applications of fertilizer containing K are preferred over fewer, heavier applications.

#### **VI. New Plantings**

- A. Nutrient management strategies for new plantings shall be based upon soil fertility analysis and consideration of soil characteristics. Collect soil samples for analysis at a rate of one composite sample per 5 acres of cranberry beds after the beds have been prepared for planting. Refer to UWEX publication A2809, or Section II of this Appendix, for fertilizer application guidelines based on soil test results.
- B. Annual applications of nitrogen should not exceed 150 lbs/ac.
- C. Individual applications of fertilizer should not exceed 15 lbs N per acre.
- D. If fertilizers containing phosphorous and/or potassium are to be applied after the plants have become established, consider alternating fertilizer applications between nitrogen-only products [i.e. urea or ammonium sulfate (21-0-0)] and complete, N-P-K blends [i.e. 13-13-13, 10-10-30, or similar products].
- E. Pre-plant applications of fertilizer containing phosphorous and/or potassium should be incorporated into the soil. Applications must be based upon soil test results and UW-Extension guidelines (see A2809 or Section II of this Appendix).
- F. Frequent, lighter applications of fertilizers are preferred on new plantings over fewer, heavier applications.

## Section II: Cranberry Nutrient Management Tables

**Table 1:** Soil test interpretation categories for phosphorous (P) and potassium (K) for \*common cranberry soils:

Nutrient	Very Low	Low	Optimum	High	Very High	Excessively High
P (ppm)	<18	18-25	26-37	38-55		>55
K (ppm)	<50	50-80	81-120	121-160	161-220	>220

\* These categories apply to Subsoil Group E [Sandy, coarse-textured soils (sands and loamy sands)] and Subsoil Group O [Organic soils (mucks and peats)], as defined in *Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin* (UWEX publication A2809). Refer to A2809 if the dominant soil type does not meet either of these descriptions.

**Table 2:** Phosphorous and potassium fertilizer application rate guidelines [from UWEX publication A2809]:

Fertilizer Component	Very Low	Low	Optimum	High	Very High	Excessively High
P <sub>2</sub> O <sub>5</sub> (lbs/ac)	†200	†125	NA	NA	--	NA
K <sub>2</sub> O (lbs/ac)	†250	†200	NA	NA	NA	NA

† **These rates are only applicable prior to cranberry bed establishment.** Incorporate all P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O before planting. For established cranberry beds, use tissue testing to guide fertilizer application rates.

**Table 3:** Cranberry tissue nutrient content guidelines for producing beds:

Nutrient	Normal Concentration (%)	Nutrient	Normal Concentration (ppm)
Nitrogen (N)	0.90 – ‡1.10	Boron (B)	15 – 60
Phosphorous (P)	0.10 – 0.20	Iron (Fe)	>20
Potassium (K)	0.40 – 0.75	Manganese (Mn)	>10
Calcium (Ca)	0.30 – 0.80	Zinc (Zn)	15 – 30
Magnesium (Mg)	0.15 – 0.25	Copper (Cu)	4 – 10
Sulfur (S)	0.08 – 0.25		

‡ Hybrid varieties, such as Stevens and Pilgrim, may benefit from tissue-N concentrations of up to 1.30%.

### Section III: Cranberry Nutrient Management Plan Outline and Optional Forms

A cranberry nutrient management plan shall be developed according to the 590 standard, as well as the criteria included in this technical note. The following outline should be used as a guide in the development of a cranberry nutrient management plan. The attached forms may be useful tools when developing a plan. These forms are not required. [Bracketed references to individual forms are included, for guidance, within this outline.] Note: Completing the optional forms may satisfy some of the items listed below. However, use of the optional forms will not preclude the need to develop a plan narrative, as some items will require further explanation.

Consider organizing the plan around nutrient management units. *Nutrient management units are groups of fields or beds that are managed similarly. A single management unit may include a group of beds with similar soil conditions, production status (new plantings, plantings of similar age, fresh-fruit beds, non-producing beds, etc.), or other considerations, which allow the unit to be managed as a whole.*

A cranberry nutrient management plan should satisfy the requirements of the 590 standard by satisfying the following items, as well as the criteria outlined in Section I of this appendix:

#### I. Plan Narrative:

The purpose of the narrative is to provide an overview of the operation and describe the nutrient management strategies for the growing season, including descriptions of how the plan will be implemented and why the proposed strategies were selected. The narrative should provide an overview of the operation, identify the nutrient management units on the marsh, explain past practices and results, explain how current strategies have been developed or refined, and discuss potential factors that may cause deviation from the intended strategies. The narrative should explain how the nutrient management plan will be implemented, with an explanation of how nutrient management decisions will be made.

##### A. Identify nutrient management units and include the following information:

*[Management Unit Identification Worksheet]*

1. Current production status.
2. A general description of the soil, including subsoil characteristics and soil characteristics within the rooting zone. Explain bed construction/renovation and management histories, including sanding practices. Focus on those characteristics and past activities that may influence nutrient management.

##### B. Summarize records of nutrient and soil amendment applications, tissue and soil fertility test results, and crop yields from previous years. If available, records from the most recent four years should be summarized in the narrative and either included with the plan or referenced if available in another format or easily accessible location. Include the following details per individual management unit:

*[5-Year Nutrient Management Summary per Management Unit]*

1. Applications of commercial fertilizers, organic byproducts (i.e. fish waste), and soil amendments (i.e. elemental sulfur), including the form, rate, and timing.
2. Plant tissue analysis results.

3. Soil fertility analysis results.
  4. Historic crop yields.
- C. Planned nutrient and soil amendment applications, including the rate, form, and timing. In addition, identify anticipated or expected yields per management unit. These should be based on historical production records, crop conditions, crop varieties grown, and grower experience.
- [Planned Nutrient Management Practices worksheet]*  
*[Fertilizer Decision-Making Checklist]*

## **II. Aerial photographs and/or maps of the farm containing:**

- A. Boundaries, identification numbers, and acreage for all beds and nutrient management units. The Wisconsin DNR has a free, internet mapping program, which may be used to generate marsh maps based on aerial photography or topographic maps:  
<http://maps.dnr.state.wi.us>.
- B. A soil map. NRCS has a free, internet mapping program, which may be used to generate soil maps: <http://websoilsurvey.nrcs.usda.gov>.
- C. Locate and identify features that require additional protection. These may include groundwater risk areas (i.e. abandoned wells), surface water risk areas (i.e. water conveyance ditches, reservoirs, streams or lakes, wetlands, etc.), or other sensitive areas. Delineate boundaries for nutrient application restriction areas. Consider depicting routes of surface water flow, reservoirs, and key surface water control points (i.e. water control structures or bulkheads), which allow for the storage or recovery of discharges from beds. Include a legend of map symbols.

## **III. Documentation of nutrient management activities:**

Document the following within-season activities per individual nutrient management unit:

- A. Actual nutrient and soil amendment applications, including the rate, form, and timing.  
*[Actual Nutrient Management Practices worksheet]*
- B. Monitoring efforts (i.e. measurements of crop potential, upright growth, soil temperatures, precipitation, etc.) and observations (i.e. plant vigor and appearance, weather events and climatic conditions, etc.) made in support of nutrient management decisions. Nutrient management activities that are inconsistent with the plan narrative should be documented.  
*[Annual Nutrient Management Observation Checklist]*

**\*\*\*Cranberry Nutrient Management Optional Forms are included on the following pages\*\*\***

## **ATTACHMENT C**

---

### **NR151 Performance Standards and Prohibitions Fact Sheets**

# Wisconsin's **Runoff** Rules

## what farmers need to know

January 2013 DNR Pub. No. WT 756 REV 1/13



**F**arms, like all major industries, must follow environmental requirements to control runoff from fields, pastures and livestock facilities. Otherwise this pollution can harm our lakes, streams, wetlands and groundwater.

Wisconsin adopted administrative rules in 2002 (NR 151), with revisions effective in 2011 that set statewide performance standards and prohibitions for all Wisconsin farms. All farmers must comply with these standards and prohibitions. Cost-share funding may be available to assist with compliance. Some state and local programs may require compliance whether or not cost-share funds are available.

This fact sheet explains the basic information that farmers need to know about these rules and how to comply with them. It is recommended that farmers contact their county land conservation staff for further details on these rules and their impact on farm operations.

### ► Agricultural Standards and Prohibitions:

#### ALL FARMERS MUST:

- *Meet tolerable soil loss ("T") on cropped fields and pastures.*
- *Annually develop and follow a Nutrient Management Plan (NMP) designed to keep nutrients and sediment from entering lakes, streams, wetlands and groundwater. Farmers may hire a certified crop advisor or prepare their own NMP if they have received proper training.*
- *Use the phosphorous index (PI) standard to ensure that their NMP adequately controls phosphorous runoff over the accounting period.*
- *Avoid tilling within 5 feet of the edge of the bank of surface waters. This setback may be extended up to 20 feet to ensure bank integrity and prevent soil deposition.*

#### ► Additional Standards:

#### FARMERS WITH LIVESTOCK MUST:

- *Prevent direct runoff from feedlots or stored manure from entering lakes, streams, wetlands and groundwater.*
- *Limit access or otherwise manage livestock along lakes, streams and wetlands to maintain vegetative cover and prevent erosion.*
- *Prevent significant discharges of process wastewater (milkhouse waste, feed leachate, etc.) into lakes, streams, wetlands, or groundwater.*

#### FARMERS WHO HAVE, OR PLAN TO BUILD, MANURE STORAGE STRUCTURES MUST:

- *Maintain structures to prevent overflow and maintain contents at or below the specified margin of safety.*
- *Repair or upgrade any failing or leaking structures to prevent negative impacts to public health, aquatic life and groundwater.*
- *Close idle structures according to accepted standards.*
- *Meet technical standards for newly constructed or significantly altered structures.*

#### FARMERS WITH LAND IN A WATER QUALITY MANAGEMENT AREA (300 feet from streams, 1,000 feet from a lake, or in areas susceptible to groundwater contamination) MUST:

- *Avoid stacking manure in unconfined piles.*
- *Divert clean water away from feedlots, manure storage areas, and barnyards located within this area.*

### ► Farmland Preservation Tax Credit:

A farmer must comply with applicable state standards to receive the Farmland Preservation Tax Credit, even if cost sharing is not available. Farmers may be considered in compliance by entering into a schedule of compliance.

This requirement applies to farmers whose land is located in a certified farmland preservation zoning district (i.e. exclusive agriculture), or for farmers who signed a farmland preservation agreement after standards were in effect for that county. Farmers should contact their county land conservation staff for more information regarding applicable standards and compliance documentation.

### ► Implementation and Financial Assistance:

Under DNR rules, a landowner is normally entitled to cost sharing if the landowner is required to implement best management practices on "existing cropland" or an "existing" livestock facility or operation in order to comply with a DNR performance standard. Cropland or livestock facilities brought into service after the effective date of the standard are considered "new" and must meet standards and prohibitions without cost-share funding. Farmers with existing cropland or livestock facilities may be eligible for state or federal cost sharing and are encouraged to contact their county land conservation staff or USDA Natural Resources Conservation Service (NRCS) office for information about current funding sources, rates and practices eligible for cost sharing.

Farmers also should work with their land conservation staff to determine how these performance standards and prohibitions may affect their participation in various federal, state and local programs, such as Farmland Preservation. You can find a directory of land conservation offices and related agencies at <http://datcp.wi.gov/Environment> under "Land and Water Conservation."

### ► Permits and Licensing:

Farmers may be required to meet NR 151 Standards in order to obtain local and state permits. For livestock siting and manure storage ordinance permits, for example, nutrient management plans and other requirements may be imposed on livestock operations without providing cost sharing. Contact your local officials for additional information.

Farmers with 1,000 or more animal units must operate under a Wisconsin Pollutant Discharge Elimination System (WPDES) permit and do not qualify for state cost sharing to meet permit requirements. Contact your DNR Service Center for more information about WPDES permits.

For more information about runoff management in Wisconsin and topics found in this brochure please visit:

**runoffinfo.uwex.edu**



Wisconsin Department of Natural Resources (WDNR), Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP), in cooperation with: USDA Natural Resources Conservation Service (NRCS), University of Wisconsin-Extension (UWEX), County Land Conservation Departments (LCD).

The cooperating agencies are EEO/Affirmative Action employers and provide equal opportunities in employment and programs including Title IX and ADA requirements. The Wisconsin Department of Natural Resources provides equal opportunity in its employment programs, services and functions, under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240. This publication is available in alternative format (large print, Braille, audiotape etc.) upon request. Please call 608/267-7494 for more information.



Graphic design by Jeffrey J. Strobel  
UW-Extension Environmental Resources Center



## Non-Agricultural Revisions to Chapter NR 151, Runoff Management Rule

The Wisconsin Department of Natural Resources (WDNR) has revised Chapter NR 151, Wisconsin Administrative Code, an administrative rule that establishes runoff pollution performance standards for both agricultural and non-agricultural practices and manure management prohibitions for agricultural facilities and practices. These standards and prohibitions are intended to achieve water quality standards. Polluted runoff from both urban and agricultural land uses contribute to the nutrients that cause unsightly algae blooms, the loss of aquatic habitat, fish kills, and other water quality problems that affect Wisconsin's lakes and streams. The rule was originally promulgated in 2002. The revised rule was published in December 2010 and became effective on January 1, 2011.

Please note that under state budget bill 2011 Wisconsin Act 32, there were two provisions which became effective on July 1, 2011, that impact implementation of Chapter NR 151. Those provisions will be mentioned under the section related to the developed urban area performance standards.

This fact sheet includes a summary of major non-agricultural revisions to Chapter NR 151 and is not inclusive of all the revisions that were made to the rule. The complete version of Chapter NR 151 can be found at <http://legis.wisconsin.gov/rsb/code/nr/nr151.pdf>. This fact sheet includes information on the following:

### **Subchapter I – General Provisions**

Revisions to Key Definitions

Revisions to Location of Best Management Practices on Navigable Waters

### **Subchapter III – Non-Agricultural Performance Standards**

Revisions to the Construction Site Performance Standards

Revisions to the Post-Construction Performance Standards

Revisions to the Developed Urban Area Performance Standards

### **Subchapter IV – Transportation Facility Performance Standards**

Revisions to Transportation Performance Standards

## **SUBCHAPTER I – GENERAL PROVISIONS**

### **Revisions to Key Definitions**

Several definitions were added because they are used in revisions to the performance standards. The terms added are “direct conduits to groundwater”, “existing development”, “filtering layer”, “impaired water”, “silviculture activity”, and “total maximum daily load”.

Several definitions were amended to add clarification: “average annual rainfall”, “connected imperviousness”, “impervious surface”, and “in-fill”. The most significant change is to the definition of MEP or “maximum extent practicable” in s. NR 151.002(25). This definition was modified to indicate that MEP is a different level of achieving a performance standard. Section NR 151.006 was created to identify when MEP applies. This definition will be used for all performance standards except those in s. NR 151.13, the developed urban area performance standard for municipalities.



## Revisions to Location of Best Management Practices on Navigable Waters

In the 2002 version of the rule, best management practices (BMPs) associated with construction sites for new development may not be located in navigable waters to receive credit for meeting any performance standard in Chapter NR 151. This restriction has been retained in the revised rule. Also in the 2002 version of the rule, best management practices for existing development, re-development or in-fill development could receive credit for construction in either perennial and intermittent streams if all applicable permits were received. As of January 1, 2011, s. NR 151.003 only allows treatment credit for newly constructed BMPs in intermittent streams for which all applicable permits have been received.

## SUBCHAPTER III – NON-AGRICULTURAL PERFORMANCE STANDARDS

### Revisions to the Construction Site Performance Standards

#### 1. Construction Site Performance Standards for Non-Permitted Sites

Specific erosion and sediment control requirements have been added for non-permitted sites. Non-permitted sites may include: construction sites that consist of land disturbing construction activity of less than one acre and construction projects that are exempted by federal statutes or regulations. Some construction sites are exempt from the performance standards. The exempt sites include one- and two family dwellings regulated by the Department of Safety and Professional Services (DSPS) (formerly the Wisconsin Department of Commerce), agricultural facilities and practices, and silviculture activities.

The revisions set minimum standards for smaller sites to protect water quality. Erosion and sediment control practices are now required at non-permitted sites to prevent or reduce all of the following:

- (a) The deposition of soil from being tracked onto streets by vehicles.
- (b) The discharge of sediment from disturbed areas into on-site storm water inlets.
- (c) The discharge of sediment from disturbed areas into adjacent waters of the state.
- (d) The discharge of sediment from drainage ways that flow off the site.
- (e) The discharge of sediment by dewatering activities.
- (f) The discharge of sediment eroding from soil stockpiles existing for more than 7 days.
- (g) The transport by runoff into waters of the state of chemicals, cement and other building compounds and materials on the construction site during the construction period. However, projects that require the placement of these materials in waters of the state, such as constructing bridge footings or BMP installations are not prohibited by this paragraph.

A permit under Subchapter III of Chapter 216, Wis. Adm. Code, is not required for these construction sites unless the WDNR determines under s. NR 216.51(3) that a permit is needed. These revisions do not include a requirement for an erosion control plan or any kind of modeling to demonstrate compliance with a numeric performance standard. Compliance can be achieved by selecting and implementing practices in accordance with WDNR technical standards as appropriate. The WDNR technical standards can be found at <http://dnr.wi.gov/runoff/stormwater/techstds.htm>.

#### 2. Construction Site Performance Standards for Permitted Sites

The revisions to the construction site performance standards for permitted sites are found in s. NR 151.11(6m). The construction site performance standards promulgated in 2002 were retained in s. NR 151.11(6) for sites where a Notice of Intent (NOI) was submitted prior to January 1, 2011. The revisions apply to sites that are permitted under subchapter III of Chapter 216, Wis. Adm. Code, and for which an NOI is submitted to the WDNR on or after January 1, 2011. Erosion and sediment control requirements for permitted sites have been modified to incorporate non-numeric effluent limit guidelines from the United States Environmental Protection Agency (USEPA). The USEPA's non-

numeric effluent limits became effective in February 2010. In addition, the erosion and sediment control requirements for permitted sites have been modified to be consistent with the erosion and sediment control standards of ch. COMM 60 for commercial building construction sites originally under the authority of the Wisconsin Department of Commerce (now DSPS). Revisions to the construction site standards for permitted sites can be broken down into four categories: *Erosion and Sediment Control Practices*, *Sediment Performance Standards*, *Preventive Measures*, and *Location and Implementation*.

#### *Erosion and Sediment Control Practices*

Erosion and sediment control practices are required at permitted sites to prevent or reduce the following:

- Items (a) through (g) listed in 1 above for non-permitted sites.
- The discharge of sediment from erosive flows at outlets and in downstream channels.
- The transport by runoff into waters of the state of untreated wash water from vehicle and wheel washing.

#### *Sediment Performance Standards*

The performance standard of 80% sediment reduction will remain in effect until January 1, 2013, after which the standard will change to a maximum discharge of 5 tons per acre per year of sediment. This modification results in a measurable number expressed as a load, making it consistent with the way total maximum daily loads (TMDLs) are calculated. The change to a load also provides equity with the sheet, rill and wind erosion performance measure for agriculture. Five tons per acre per year is roughly equivalent to the most prevalent tolerable soil loss rate in the state.

The WDNR is currently working on a modification to the revised universal soil loss equation 2 (RUSLE2) model that can be used to estimate the sediment load leaving a construction site under varying land and management conditions. The WDNR anticipates that the model will be available for public use prior to January 1, 2013. If it is not available, compliance will continue to be determined by the development of an adequate erosion and sediment control plan that utilizes appropriate BMPs that are consistent with the technical standards.

#### *Preventive Measures*

The erosion control plan for permitted sites must incorporate maintenance of existing vegetation, especially adjacent to surface waters whenever possible, minimization of soil compaction and preservation of topsoil, minimization of land disturbing construction activity on slopes of 20% or more and the development of spill prevention and response procedures.

#### *Location and Implementation*

BMPs must be located so that treatment occurs before runoff enters waters of the state. Also, the BMPs used to comply with the performance standards must be implemented as follows:

- Erosion and sediment control practices must be constructed or installed in accordance with the erosion control plan before land disturbing construction activities begin.
- Erosion and sediment control practices must be maintained until final stabilization.
- Final stabilization must commence when land disturbing construction activities cease and final grade has been reached on any portion of the site.
- Temporary stabilization activity must commence when land disturbing construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days.
- BMPs that are no longer necessary for erosion and sediment control must be removed by the responsible party.

## Revisions to the Post-Construction Performance Standards

The revisions to the post-construction performance standards were added via s. NR 151.12(2)(bm) and ss. NR 151.121 to 151.128. The post-construction performance standards promulgated in 2002 were retained in s. NR 151.12(5) for sites where an NOI was submitted prior to January 1, 2011. The revisions to the post construction performance standards in ss. NR 151.121 to 151.128 only apply to sites required to obtain coverage under a construction site discharge permit as regulated under Chapter NR 216, Wis. Adm. Code, and that are subject to the construction performance standards of s. NR 151.11, and only apply to those sites where an NOI was received by the WDNR on or after January 1, 2011.

### 1. Applicability

The exception for a redevelopment post-construction site with no increase in exposed parking lots or roads was eliminated for sites where an NOI is filed on or after January 1, 2011.

### 2. Maintenance of Effort

For redevelopment sites where the redevelopment will be replacing older development that was subject to the post-construction performance standards of the 2002 version of Chapter NR 151, the storm water management plan must meet the TSS reduction, peak flow control, infiltration, and protective areas standards applicable to the older development or meet the redevelopment standards of the revised code, whichever is more stringent. The purpose of this is to prevent back-sliding to a lesser standard.

### 3. Total Suspended Solids (TSS) Performance Standard for Redevelopment

The requirement to reduce the TSS load by 40% compared to no controls for the entire redevelopment post-construction site has been revised to 40% reduction of the TSS generated on parking areas and roads on a redevelopment post-construction site. This focuses the treatment effort on the dirtiest source areas for TSS.

### 4. Peak Discharge Performance Standard

The peak discharge performance standard has been revised to include the 1-year, 24-hour design storm along with the current 2-year, 24-hour design storm as peak flow rates that must match the pre-development 1- and 2-year storms. This change is based on research showing that the previous standard was not protective enough of the bank-full condition.

Maximum pre-development runoff curve numbers have been added for woodland and grassland cover condition. The revised Table 2 is included below.

<b>Table 2. Maximum Pre-Development Runoff Curve Numbers</b>				
<b>Runoff Curve Number</b>	<b>Hydrologic Soil Group</b>			
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Woodland	30	55	70	77
Grassland	39	61	71	78
Cropland	55	69	78	83

The peak discharge exemption for not increasing the existing surface water elevation at any point within the downstream receiving water by more than 0.01 of a foot for the 2-year, 24-hour storm event has been eliminated and replaced with an exemption for a post-construction site where the discharge

is directly into a lake over 5,000 acres or a stream or river segment draining more than 500 square miles. A map identifying lakes over 5,000 acres and stream and river segments draining more than 500 square miles is included in the WDNR's guidance document for Modeling Post-Construction Storm Water Management Treatment dated December 20, 2010. This document can be found at: [http://dnr.wi.gov/runoff/stormwater/guidance/Modeling\\_PostConstruction.pdf](http://dnr.wi.gov/runoff/stormwater/guidance/Modeling_PostConstruction.pdf).

**5. Infiltration Performance Standard**

The revised infiltration standards are summarized in the following table:

<b>Level of Connected Imperviousness<sup>1</sup></b>	<b>Infiltration Performance Standard</b>	<b>Maximum % of the Post-Construction Site Required as Effective Infiltration area</b>
Low Imperviousness <i>Up to 40% Connected Imperviousness</i>	90% of the pre-development infiltration volume	1%
Moderate Imperviousness <i>More than 40% and up to 80% Connected Imperviousness</i>	75% of the pre-development infiltration volume	2%
High Imperviousness <i>More than 80% Connected Imperviousness</i>	60% of the pre-development infiltration volume	2%

<sup>1</sup>A histogram showing typical percent connected imperviousness for various standard land uses can be found in the WDNR's guidance document for Developed Urban Areas and the 20% and 40% TSS Reductions dated November 24, 2010. This document can be found at: [http://dnr.wi.gov/runoff/stormwater/guidance/Guidance\\_TSS.pdf](http://dnr.wi.gov/runoff/stormwater/guidance/Guidance_TSS.pdf)

The prohibitions, exemptions, and other limitations for infiltration previously outlined under ss. NR 151.12(5)(c)5. and 6. have been reorganized. The actual language of the section remains largely unchanged. The section has been reorganized as follows:

*Source Areas*

Prohibitions – Runoff from certain source areas may not be infiltrated and no credit will be given towards meeting the infiltration performance standard.

Exemptions – Infiltration of runoff from certain source areas may be credited towards meeting the standard, but infiltration is optional.

*Location of Practices*

Prohibitions – Infiltration practices may not be located in certain areas. Minimum distances between the bottom of the infiltration system and bedrock or groundwater are identified based on source areas.

Exemptions – Infiltration rate exemptions are provided for low permeable soils and certain soil classifications.

**6. Protective Area Performance Standard**

The rule revisions increase the protective area from 50 feet to 75 feet for certain high quality wetlands such as sedge meadows, open and coniferous bogs, low prairies, calcareous fens, coniferous

swamps, lowland hardwood swamps and ephemeral ponds. Information on wetland types can be found at: <http://dnr.wi.gov/wetlands/types.html>

### **Revisions to the Developed Urban Area Performance Standards**

Revisions to this section included an option for permitted municipalities that may have difficulty meeting the 40% TSS reduction requirement by March 31, 2013. A permittee could declare they were unable to meet the deadline and the rule revisions identified a process for them to follow. The process included the requirement for a storm water management plan, storm water management plan submittal requirements, the WDNR review process, and the allowance of up to 10 more years to comply with the standard provided the plan is followed. Under state budget bill 2011 Wisconsin Act 32, there were two provisions which directly impact implementation of the revisions to the developed urban area performance standard. First, specific to the requirement to reduce TSS by 40% by 2013, 2011 Wisconsin Act 32 prohibits the WDNR from enforcing the 40% TSS performance standard by a certain date. This provision of the budget bill does not impact any other performance standards in Chapter NR 151. The requirement to meet the 20% TSS reduction is still in force as are all performance standards addressing new construction and redevelopment. A second provision of 2011 Wisconsin Act 32 identifies that where a permitted municipality has achieved a reduction above the 20% TSS performance standard, all structural best management practices in place on July 1, 2011, must be maintained to the maximum extent practicable.

Implementation of the provisions of 2011 Wisconsin Act 32 will be reflected in the MS4 general permit and MS4 individual permits when those permits are issued or reissued.

## **SUBCHAPTER IV – TRANSPORTATION FACILITY PERFORMANCE STANDARDS**

### **Revisions to Transportation Performance Standards**

The modifications to Subchapter IV include many of the same changes to the performance standards in Subchapter III. However, since Subchapter IV is specifically for transportation, several provisions are tailored to those types of facilities.

#### 1. Applicability

Transportation facilities include highways, railroads, public mass transit facilities, public-use airports, public trails, and harbor improvements. The modifications of new construction site and post-construction performance standards only apply to transportation facility construction sites for which the WDNR receives a Notice of Intent to apply for construction site storm water discharge permit coverage under Chapter NR 216, Wis. Adm. Code, on or after January 1, 2011; or to transportation facility construction sites for which bids have been advertised or construction contracts signed for which no bid was advertised on or after January 1, 2011.

#### 2. Definitions

The definition of “minor reconstruction” as it applies to a highway no longer includes the replacement of a vegetated drainage system with a non-vegetated drainage system. If there is a conversion of the drainage system from vegetated to non-vegetated (e.g., swales to storm sewer), then the area of the conversion is not minor reconstruction and is subject to the applicable reconstruction performance standards.

#### 3. Performance Standards for Small Sites and Routine Maintenance

The prescriptive construction site performance standards for transportation facility construction sites disturbing less than one acre of land and routine maintenance consisting of less than 5 acres are the

same as those listed for non-permitted construction sites (See *Construction Site Performance Standards for Non-Permitted Sites* on page 2 above).

**4. Performance Standards for Sites Disturbing One or More Acre**

The construction site performance standards for transportation facility construction sites disturbing one acre or more of land are the same as those listed for permitted construction sites (See *Construction Site Performance Standards for Permitted Sites* on page 2 above).

**5. Post-Construction Performance Standards**

There have been some modifications to the post-construction performance standards and exemptions for highways. The table below illustrates the applicability and exemptions of the post-construction performance standards for highways.

**Post-Construction Performance Standards for Highways**

	<b>Minor Highway Reconstruction</b>	<b>Highway Reconstruction<sup>1</sup></b>	<b>New Highway Construction</b>
<b>TSS Reduction</b>	No	Yes (40% reduction) <sup>2</sup>	Yes (80% reduction)
<b>Peak Discharge</b>	No	No	Yes
<b>Infiltration</b>	No	No	No <sup>3</sup>
<b>Protective Areas</b>	Yes	Yes	Yes

<sup>1</sup> For highway reconstruction less than 1.5 miles that does not qualify as minor reconstruction because of the drainage system conversion, the 40% TSS performance standard only applies to the areas converted from a vegetated drainage system to a non-vegetated drainage system.

<sup>2</sup> For municipalities covered under a municipal separate storm sewer system (MS4) permit, this 40% TSS performance standard first applies 1/1/2017. For municipalities not covered by an MS4 permit, this 40% TSS performance standard applies as of 1/1/2011.

<sup>3</sup> This exemption applies to new stand-alone highways such as an interstate, state highway, county highway, or local road. New roads that are part of a larger common plan of development such as residential, commercial, or industrial development are subject to Subchapter III of Chapter NR 151.

**Swale Treatment**

The swale treatment performance standard references compliance with the existing technical standard for swales, “Vegetated Infiltration Swale” (Technical Standard No. 1005). This technical standard is available at: <http://dnr.wi.gov/runoff/stormwater/techstds.htm#Post>. Additional guidance on implementation of this performance standard is available in the WDNR’s guidance document for Modeling Post-Construction Storm Water Management Treatment dated December 20, 2010. This document can be found at:

[http://dnr.wi.gov/runoff/stormwater/guidance/Modeling\\_PostConstruction.pdf](http://dnr.wi.gov/runoff/stormwater/guidance/Modeling_PostConstruction.pdf).

*This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations, and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.*

## **ATTACHMENT D**

---

### **Conservation Cost Share Program Policy – Tier Level Practices**

**VILAS COUNTY LAND AND WATER CONSERVATION  
Conservation Cost Share Program Policy – Tier Level Practices**

**I. AUTHORIZATION**

On October 16, 2012, the Vilas County Land and Water Conservation Committee (LCC) adopted the following policy in regard to Conservation Cost Share program practices that are offered to private landowners through the Vilas County Land and Water Conservation Department. Conservation practices that are offered to private landowners are defined under ATCP 50 Administrative Rule – Soil and Water Resource Management Program. Each of the cost-sharable conservation practices available to landowners are placed into one of three tier levels of grant funding that are defined in this policy. When a private landowner voluntarily participates in the Conservation Cost Share Program starting on or after January 1, 2013, the policy will become applicable when they enter into a contract agreement with Vilas County. All tier level cost share practices and rates are subject to the terms and conditions set forth in this policy.

**II. PURPOSE**

The intent of this policy is to clarify what conservation practices are available to private landowners in Vilas County under the Conservation Cost Share Program and in which percentage level of grant coverage those practices will be cost shared.

**III. OBJECTIVES**

- To initiate a cost containment measure that will serve to divide the grant funding received in Vilas County annually to provide conservation projects to as many private landowners as possible in a given year.
- To offer cost-sharing grant incentives to private landowners who voluntarily choose to implement conservation practices on their land.
- To prioritize the conservation practices implemented on the land that will meet goals and objectives outlined in the most current Land and Water Conservation Resource Management Plan.

**IV. ADMINISTRATION**

Administration of tier level cost share practices and this policy will be the responsibility of the Vilas County Conservationist. The Conservationist will oversee the review process for all conservation cost share applications that are submitted to the Land and Water Conservation office. The appropriate cost share rate for each project being implemented at the site will then be determined. If the landowner believes that they may qualify for economic hardship status, the Conservationist will require that the landowner submit further documentation to determine eligibility (refer to *Determination of Economic Hardship* below).



## V. PROCEDURES

Conservation practices are divided among three tier levels outlined below in order of increased potential intensity of soil erosion or pollution on the landscape, to groundwater or to surface water resources.

### **TIER I Practices and Cost Share Rate:**

In general, Tier I practices provide funding for practices that have minor erosion or pollution potential, normal toe erosion of banks, or to improve wildlife or fishery habitats. The County's portion of cost share for Tier I practices will be up to 50% of the total cost of a project. There will be no set maximum cost for any practice installed unless otherwise noted on the attached Table 1 and limited to the remaining annual grant funding available to the county. Practices in this category include: Riparian Buffers, Streambank and Shoreland Protection, Field Windbreaks, Residue Management, Strip-cropping, Terrace Systems, Wetland Development or Restoration (refer to Table 1).

### **TIER II Practices and Cost Share Rate:**

In general, Tier II practices provide funding for practices that have increasing levels of soil erosion or pollution potential, to create wildlife or fishery habitat, or to install soft agricultural practices. The County's portion of cost share for Tier II practices will be up to 60% of the total cost of a project. There will be no set maximum cost for any practice installed unless otherwise noted on the attached Table 2 and limited to the remaining annual grant funding available to the county. Practices in this category include: Access Roads and Cattle Crossing, Animal Trails and Walkways, Contour Farming, Cover Crop, Critical Area Stabilization, Diversions, Filter Strip, Grade Stabilization Structure, Roofs, Roof Runoff Systems, Sediment Basins, Sinkhole Treatment, Subsurface Drains, Underground Outlets, Water and Sediment Control Basins, Waterway Systems (refer to Table 2).

### **TIER III Practices and Cost Share Rate:**

In general, Tier III practices provide funding for practices that have major levels of soil erosion or pollution potential, to create management plans, or to install hard agricultural practices. The County's portion of cost share for Tier III practices will be up to 70% of the total cost of a project. There will be no set maximum cost for any practice installed unless otherwise noted on the attached Table 3 and limited to the remaining annual grant funding available to the county. Practices in this category include: Manure Storage System, Manure Storage System Closure, Barnyard Runoff Systems, Heavy Use Area Protection, Livestock Fencing, Milking Center Waste Control Systems, Livestock Watering Facilities, Nutrient Management, Pesticide Management, Prescribed Grazing, Relocation / Abandon Animal Feeding Operations, Waste Transfer System, Wastewater Treatment, Strips, Well Decommissioning (refer to Table 3).

**Economic Hardship:**

If the landowner qualifies for economic hardship status as determined by the county, the county's share of the cost share grant for each of the tier levels will increase by 20%, and the hourly rate technical service fees associated with normal cost share projects will be waived. The landowner will still be responsible for paying the application fee of \$25, the contract processing fee of \$50, and the optional project permit fee of \$100 (if applicable). Tier I cost share rate will increase to 70%; Tier II cost share rate will increase to 80%; and Tier III cost share rate will not exceed 90% of the total cost of an installed practice.

**Determination of Economic Hardship:**

- A. If a landowner believes they may qualify for economic hardship status under ATCP 50.42 (4), the Vilas County Land and Water Conservation Committee will require the landowner to submit a financial statement prepared according to generally accepted accounting principles. This financial statement may be compiled, reviewed or audited; however, it must contain a balance sheet and income statement and should be in sufficient details to determine the following:
  - 1) The landowner will be unable to pay the normal landowner share of the practice(s) installed, and
  - 2) The landowner would be able to pay for the installed practice(s) at the economic hardship rate.
  
- B. The Vilas County Land and Water Conservation Committee will also require the landowner to certify in a sworn affidavit (a form will be provided by the department), a full and true disclosure of the landowner's financial condition, including documents used to support the economic hardship. If it becomes necessary to copy those records for our files, the department will protect those records from public disclosure to the extent allowable under Wisconsin's Public Records Law.
  
- C. Review of the landowner request for economic hardship status will take place during the next regularly scheduled Land and Water Conservation Committee meeting following submittal of the financial statement. Elected officials of the Land and Water Conservation Committee will make the final determination of economic hardship status within a reasonable time period not to exceed two months following the submittal of the financial statement.

**VI. ENFORCEMENT**

Enforcement of this policy will be the responsibility of the Vilas County Conservationist. All landowners who participate in the Conservation Cost Share Program will be responsible for paying all assessed charges and fees associated with their project(s). For more information on the fee schedule, refer to the Vilas County Land and Water Conservation Technical Service Fee Policy.

# **ATTACHMENT E**

---

## **Wetland Plants of Concern**

## ENVIRONMENTALLY HARMFUL WETLAND PLANTS OF CONCERN IN NORTHERN WI

Prepared by Vilas County Land & Water Conservation Department, spring 2014



### Flowering rush (*Butomus umbellatus*)

**When to look:** Mid to late summer in shallow water when the plants are in bloom. Throughout the aquatic growing season in deeper water as blossoms will not form.

**Where to look:** Wetlands, lakeshores, slow-moving rivers, and in water up to 10 feet deep.

**Key features:** A rhizomatous perennial aquatic plant capable of growing as an emergent in shallow water or submersed in water up to 10 feet deep. Leaves are thin, linear, pointed, 3 feet long or more, untoothed, parallel veined, twisted, triangular in cross-section and arise in two rows along the rhizome/base. When in deep water the leaves are limp and floating, reaching the surface where they move with the water, and the plant does not bloom. When in shallow water the leaves stand erect above the water, resembling bulrushes, and the plant booms. Flowers grow on tall, cylindrical stalks in round-topped umbrella-like clusters of 20-50 flowers having three large pink petals. The three sepals under the petals are also pink and look like small petals, thus the flower is sometimes described as having six pink petals. Bulbils (little bulb-like plant sprouts) may be present at the base of flower stalks and at the roots. Bulbils released from the plants can float freely to start new plants elsewhere. Rhizomes are fleshy and grow trailing along the ground.

#### Sources for additional information:

<http://dhr.wi.gov/topic/invasives/fact/floweringrush.html>

<http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds/weed-identification/flowering-rush.aspx>

<http://www.issg.org/database/species/ecology.asp?si=610&>

[http://www.nrcs.usda.gov/Internet/FSE\\_PLANTMATERIALS/publications/mtpmstn10617.pdf](http://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/mtpmstn10617.pdf)

## ENVIRONMENTALLY HARMFUL WETLAND PLANTS OF CONCERN IN NORTHERN WI

Prepared by Vilas County Land & Water Conservation Department, spring 2014



### Garden loosestrife (*Lysimachia vulgaris*)

Also known as yellow loosestrife, willowweed and willowwort

**When to look:** When blooming during late summer, approximately July to September

**Where to look:** Moist habitats such as fens, wet woods, wetlands, riparian areas, lakeshores, stream banks, ditches

**Key features:** Erect rhizomatous (stoloniferous) perennial attaining a height of 3 to 5 feet or more. Stems and leaves are softly hairy. Leaves are 3 to 5 inches long and egg-shaped, usually growing 3 leaves in a whorl. Showy, bright yellow flowers grow in clusters near the top of the plant. Flowers have 5 petals joined at the base and sometimes have a red or orange eye. Base of the flowers is ringed by green sepals with orange-brown edges. Roots form creeping stems that are partly or entirely underground. Rhizomes can be up to 15 feet long. Once established, is highly competitive and able to spread aggressively by seeds and rhizomes into stands of established vegetation. Able to out-compete cattails and purple loosestrife.

#### Sources for additional information:

<http://luirig.altervista.org/photos-search/index2.php?rcn=17966>

<http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds/weed-identification/garden>

<http://www.ecy.wa.gov/programs/wq/plants/weeds/GardenLoosestrife.html>

<http://piercecountyweedboard.wsu.edu/gardenloosestrife>

## ENVIRONMENTALLY HARMFUL WETLAND PLANTS OF CONCERN IN NORTHERN WI

Prepared by Vilas County Land & Water Conservation Department, spring 2014



### **Giant common reed grass (*Phragmites australis*)**

Also known as common reed grass, ditch reed, giant reed

**When to look:** Year round as dead brown leaves from previous growing season remain standing throughout winters. Spring prompts new growth of leaves and summer flowers.

**Where to look:** Freshwater marshes, river edges, shores of lakes and ponds, roadsides, disturbed areas.

**Key features:** Phragmites is a tall perennial grass. The non-invasive strain native to WI is typically found in small, low density populations whereas the non-native, invasive phragmites forms large, tall, dense stands attaining a height of 10 - 15 feet or more including both live stems and standing dead stems from the previous growing season. Stems are round and hollow growing from stout, creeping rhizomes. Leaves are light green in early summer turning to light brown in fall, flat, 1-1.5 inches wide at their widest point, elongate, tapered to a point and attached to the stem by smooth sheaths. Flowers, grouped into spikelets borne on highly branching purple inflorescences, form bushy panicles in mid to late summer and are usually purple or golden in color. As seeds mature, the panicles begin to look “fluffy” and take on a grey sheen due to the hairs on the seeds. Roots form dense networks of rhizomes several feet deep. Plant spreads horizontally by sending out rhizome runners which can grow 10 or more feet in a single growing season.

### **Sources for additional information:**

<http://dnr.wi.gov/topic/invasives/fact/phragmites.html>

[http://www.great-lakes.net/envt/flora-fauna/invasive/pdf/phragmites\\_glc\\_factsheet\\_2011.pdf](http://www.great-lakes.net/envt/flora-fauna/invasive/pdf/phragmites_glc_factsheet_2011.pdf)

<http://www.nps.gov/plants/alien/fact/pdf/phau1.pdf>

## ENVIRONMENTALLY HARMFUL WETLAND PLANTS OF CONCERN IN NORTHERN WI

Prepared by Vilas County Land & Water Conservation Department, spring 2014



### Yellow iris (*Iris pseudacorus*)

Also known as yellow flag iris, Yellow iris and Water flag

**When to look:** Short flowering season, late spring to early summer

**Where to look:** Wetlands, along streambanks and shorelines and in water up to 10-12 inches deep

**Key features:** Herbaceous flowering perennial attaining a height of 3 to 6 feet in dense stands of robust plants. Erect sword shaped leaves up to 3 feet long and 1.5 inches wide are easily confused with cattails when plant is not blooming. Leaves are folded and clasp the stem at the base in a fan-like fashion. Flowers are especially showy, bright yellow and 3 to 4 inches across, with a darker yellow zone and brown or violet veining on each fall. Flowers give way to large, glossy green, triangular shaped seed pods. Grows best in very wet conditions where it tolerates submersion, low pH, and anoxic soils. Spreads quickly by both rhizome and water-dispersed seed. While primarily an aquatic plant, the rhizomes can survive prolonged dry conditions. Can create dense, monotypic stands, outcompeting native plants. All parts of plant are poisonous, especially the rhizomes, resulting in lowered wildlife food sources in areas where it dominates.

**Sources for additional information:**

<http://dhr.wi.gov/topic/Invasives/fact/YellowFlagIris.html>

<http://plants.ifas.ufl.edu/node/205>

[http://www.na.fs.fed.us/fhp/invasive\\_plants/weeds/yellow-iris.pdf](http://www.na.fs.fed.us/fhp/invasive_plants/weeds/yellow-iris.pdf)

<http://www.kingcounty.gov/environment/animalsAndPlants/noxious-weeds/weed-identification/yellow-iris.aspx>