Forest County
Land and Water Resource Management Plan

2018-2027

Sunset in Wabeno

September 2017

Prepared by: North Central Wisconsin Regional Planning Commission

ACKNOWLEDGEMENTS

Forest County's Land and Water Resource Management Plan was developed with input from a group of concerned residents and staff with diverse backgrounds. Special thanks are extended to the following people:

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September 2017

This plan was prepared under the direction of the Forest County Land and Water Conservation Committee by the North Central Wisconsin Regional Planning Commission.

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TABLE OF CONTENTS

Chapters

Maps

Map 1 Land Use

Map 2 Designated Waters

Map 3 Public Land Ownership

Attachments

A – Outstanding and Exceptional Resource Waters

B – Open-status Contaminated Soil Sites in Forest County

C – Public Hearing Notice

D – Conservation Practices and Cost-Share Rates

E – Watershed Strategies for Improving Impaired Water Quality

F – Appendix G in the 2007 Lake Metonga Adult Fish Survey Preliminary

PLAN SUMMARY
Chapter 1

Introduction
The Forest County Land and Water Resource Management (LWRM) plan was developed to assist the county in managing and protecting the land and water resources throughout Forest County.

The goals and objectives in this plan will help resolve local natural resource problems as identified by the Citizens Advisory Committee (CAC). These goals and objectives will also provide the basis for various private, local, state, and federal agencies to coordinate implementation of their programs of land and water management. Additional advice was received from the Forest County Land and Water Committee during the course of meetings and in the form of motions or suggestions for items and issues to include in the plan.

Public Participation
The Forest County Land Conservation / Agriculture and Extension (LC/AE) Committee directed the Land and Water Conservation Department (LWCD) to gather a diverse group of agencies, associations, and individuals to assist in the development of this land and water resource management plan. The Technical Advisory Committee (TAC) and the CAC were established to assist the LC/AE and the LWCD to create this 2017-2026 Forest County LWRM Plan.

In January 2016, the NPS Regional Contact for the Northern Region of DNR was contacted, and the Water Basin Leader was officially invited to participate in the TAC (email on file).

The CAC met in July 2015 to begin discussion on the future policy and goals of the 10 year Land and Water Plan. The following list of policies & goals were discussed as part of their initial conversations:

- Maintain or reverse eutrophication of our waters.
- Promote Forest Consumption.
- 9 Key elements for impaired waters.
- Shoreland areas – Slow spread of invasive species both aquatic & terrestrial.
- Monitor and/or reduce phosphorus runoff to surface water.
- Look into sufficient recycling sites to allow for composting/brush removal for all towns in Forest County.
- Provide constant/annual up to date landowner information regarding shoreland practices and best management practices.

A Technical Advisory Committee (TAC) of natural resource professionals was invited to review the Resource Assessment (Chapter 3), and to add additional perspective on the inventory and current trends. Those perspectives were provided individually by email, and they were incorporated into Chapter 3. The TAC professionals are listed with their representation on the back of this plan's cover.

Comments from both the TAC, CAC, and LC/AE meetings were incorporated into various parts of the plan.

The Public Hearing was held at 5:00 p.m. on September 6, 2017, and the LC/AE met directly after the public hearing. All of the changes discussed during the public hearing were approved by the LC/AE.

The County Board is scheduled to adopt this plan in October 17, 2017.

Current Land Use Issues

Overall, the only water quality problems in Forest County can be attributed to the deposition of mercury, that cannot be controlled within the county, or possibly eutrophication where only the effects can be mitigated. Pollution of surface waters, by human generated or non-point source generators is minimal. The county is relatively undeveloped and there is little municipal or industrial waste that cannot be mitigated or recycled. Twenty fisheries, both cold and warm water, are supported by stocking in spite of water quality being good to excellent.

In 2016 there were 12 water bodies listed as impaired; 5 from "unknown" pollutants, 6 from mercury, and 1 from total phosphorus. See Table 3.

In 2016 there were 5 lakes, 6 creeks, and 8 rivers that are ORWs; and 22 ERW creeks, & 6 ERW rivers. Attachment A lists those waters.

Performance Standards and Prohibitions Implementation Strategy

Agricultural Performance Standards

A voluntary educational approach will continue to be used to achieve erosion control standards in Forest County. One-on-one contacts with landowners and operators who request technical assistance is the most common method used to promote soil conservation in Forest County. Technology will allow more oversight as LIDAR and the associated GIS based programs can indicate possible areas of concern. With this technology, landowners and operators can be more easily persuaded that the larger landscape is subtly influenced by changes on a smaller scale. Knowing this service is available would allow landowners and operators to be more proactive and a better sense of cooperation would ensue.

After adoption of the Exclusive Ag Zoning, a list of all farmers (<127) will be complied from the tax base. Each farmer's land will be categorized for susceptibility to erosion based on proximity to water, soil type and topography. Those with the highest ratings will be monitored on a regular basis and assistance given to those properties exhibiting signs of erosion. Compliance will be achieved by citation if necessary.

Non-Agricultural Standards

One-on-one contacts with landowners and contractors are the most common method used to promote construction erosion control. In Forest County, shoreland is one of the most developed classes of property in private ownership. As such, these parcels are subject to permitting for all development. Each permit and each parcel is inspected for runoff conditions multiple times during development by Uniform Dwelling Code inspections and land conservation oversight. Alterations of shoreland areas over 10,000 square feet are reviewed and permitted by the Department of Natural Resources. In non-shoreland areas, most developments are internally drained. The larger areas are still under the permitting umbrella of the WDNR but the County is an arbitrator of disputes caused by improper stormwater management, erosion and other disagreements caused by land altering activities through our Nuisance Ordinance. Once again LIDAR will be instrumental in understanding the consequences of proposed permit applications on the landscape. Ultimate compliance with prohibitions will be achieved by citation.

Priority Farm Strategy

Agricultural land management is usually the focus of Land and Water Resource Management plans. In Forest County, the largest crop is timber followed by forage, with only a small percentage in row crops. Few of these agricultural activities are in the shoreland areas. Forest land in the county is enrolled in the State's Managed Forest Law (MFL). These forests are cut on a rotational basis under the supervision of the State and seldom clear cut. The federally funded EQUIP program encouraged clear cutting. Erosion seldom occurs on these parcels as certified loggers dominate the cutting market and proper practices are the hallmark of certification. Program information is provided through a yearly newspaper published and delivered to each household in conjunction with the area's only free newspaper.

A general approach to providing information to all farms will occur with Work Plan activities. As problems become apparent through GIS analysis and monitoring of specific farms, then individual attention will be given to that farm to bring them into compliance.

Major 2012-2017 Work Plan Accomplishments

Goal 1: Slow the spread of non-native invasive species.

- Continued support of Tri-county AIS Partnership
- Continued support of WRISC Partnership (multi county, multi state)
- Continued support for County Lake Association membership
- Continued support for all lake association education

Goal 2: Maintain a healthy and vigorous forest.

- Encourage sustainable forestry practices on private and public lands.
- Encouraged Federal guidelines for clear cuts to support healthy wildlife populations
- Reduce illegal garbage dumping on commercial, county, state, and federal forest lands by providing adequate facilities for garbage, recycling and other banned landfill items including toxic waste.

Goal 3: Protect shoreland areas.

- Promote best management practices to restore and maintain riparian habitat by elevating erosion as a nuisance subject.
- Protect shoreland stewardship by creating new shoreland ordinance

Goal 4: Reduce phosphorus loading to surface waters.

- Reduce phosphorus from septic systems by completing the county sanitary database and requiring additional soil tests to confirm good soil conditions and adequate facilities for homes.
- Reduce phosphorus pollution by investigating muck samples from area lakes to confirm internal loading designations and investigate sources
- Control soil erosion by elevating soil movement across property lines as a subject of nuisance citation.

Goal 5: Promote well planned development.

- Implement local and county comprehensive plans by matching zoning maps to town land use maps.

Goal 6: Reduce mining impacts on water resources.

- Maintain working knowledge of mining laws and requiring non-metallic mines to be stormwater compliant
- Discuss status of current mining rules, stay current and support townships that are in favor of mining.

High Priority 2018-2027 Goals & Objectives

The Goals & Objectives are organized with the most important goals first. Objectives were not prioritized under each goal.

Goal 1: Remove and Reverse Lake Eutrophication.

- Educate and assist towns, lake districts/associations, landowners, and legislators to understand the merits of vacuum dredging accumulated sediment and aquatic invasive species to remove impairments.
- Assist in the reduction and removal of legacy sediment from waterbodies by towns, lake districts/associations, and landowners.
- Support legislation to allow local maintenance of near shore areas to benefit fish populations and aid navigation.

Goal 2: Slow the spread of invasive and non-native nuisance species.

- Assist lake organizations and landowners in mapping invasive species.
- Assist in acquiring a vacuum weed harvester or vacuum dredge.
- Keep lake organizations appraised of grant opportunities.
- Maintain educational levels for invasive species.
- Participate with local and regional groups that monitor and remove invasive species.

Goal 3: Increase the amount and quality of information available concerning land and water in Forest County.

- Procure LIDAR for Forest County.
- Create legal mapping for ordinances with parcel based GIS.
- Maintain stakeholder status in the Upper Fox and Wolf TMDL Development.

Goal 4: Reduce phosphorus and nitrogen loading to surface waters.

- Create farmland preservation ordinance.
- Monitor and reduce runoff to surface waters.
- Monitor and inspect existing sanitary systems.

Goal 5: Promote well planned development.

- Revise County Comprehensive Plan to address dwindling tax base.
- Create Farmland Preservation Zoning ordinance.
- Adopt flood shadow for Bog Brook and Pine Lake.
- Update all ordinances and provide information to landowners.
- Create wetland bank from tax delinquent or available properties.
- Scan all permits to GCS to maintain an environmental database.

Goal 6: Maintain a healthy and vigorous forest.

- Establish a single point of contact between Forest County and the USFS (United States Forest Service) to implement and expand the "Good Neighbor Agreement."
- Continue to implement the 15-year County Forest Land Use Plan.

Regulations

Forest County has reviewed local, state, and federal regulations relating to land and water resource management for implementing this plan. The regulations that cover land or water resources are briefly described in Chapter 7 of this plan.

Progress Tracking, Evaluation, & Coordination

The Forest County Land and Water Resource Management Plan is intended to be a working document. This plan will be reviewed annually by the Land Conservation / Agriculture and Extension (LC/AE) Committee to track progress in accomplishing the goals and objectives of this plan. The methods that will track the progress of the goals & objectives are described in Chapter 8. Coordination among many agencies will be necessary to effectively complete goals & objectives. Forest County has taken steps to legally inform all Federal and State Agencies of our desire to coordinate.

Conclusion

The Forest County Land and Water Resource Management Plan provides a framework for local/state/federal conservation program implementation efforts. It is a working document that will utilize existing partnerships to achieve the goals and objectives identified within this plan. The availability of funding for staff and cost sharing will determine the progress in achieving the goals and objectives of this plan. Ultimately, implementation of this plan will protect and improve the valuable natural resources of Forest County as well as maintain the vision of preserving Forest County's abundant rural character.

PLAN DEVELOPMENT AND PUBLIC PARTICIPATION
Chapter 2

Introduction

Locally led natural resource management is an important concept in Wisconsin land and water conservation. State and federal agencies support the idea that local residents are best suited to identify and provide solutions for natural resource problems within a county. At the root of the county Land and Water Resource Management (LWRM) plan is the concept of cooperation among local residents and all natural resource agencies operating within the county. The Department of Agriculture, Trade, and Consumer Protection (DATPC) requires that each county Land and Water Conservation Department (LWCD) locally create a 10-year Land & Water Resource Management (LWRM) plan (Ch.92, WI Statutes) to coordinate LCD activities. The Forest County Land Conservation / Agriculture and Extension Committee contracted with North Central Wisconsin Regional Planning Commission (NCWRPC) to assist with facilitating the LWRM planning process.

Chapter ATCP 50 implements Wisconsin's soil and water resource management program under Ch. 92, WI Stats. The Department of Agriculture, Trade and Consumer Protection administers the Soil and Water Resource Management Program (Ch. ATCP 50) in cooperation with county land conservation committees, the Land and Water Conservation Board, the Department of Natural Resources and other state and federal agencies. The program has the purposes specified under Sec. 92.14 (2), WI Statutes.

What is a LWRM Plan?

The process of the plan development is as important as the finished plan, so we will start by describing how the plan was created.

The process includes an assessment of resource conditions and needs within the county, as well as group decisions by local citizens and resource professionals on the best methods of addressing identified needs. Local, state, and federal water quality goals and conservation objectives are also considered in plan development. The Forest County Land Conservation / Agriculture and Extension Committee of the County Board oversaw the whole plan development process. Local natural resource management professionals reviewed how any new information should change the current document. A group of county residents with various backgrounds participated in a group meeting to review what the local professionals had to say, and then created and chose which goals to make the highest priority. Several reviews occurred along with a

public hearing, and then it was presented to the Land and Water Board in Madison for approving the way we created the plan according to their overall requirements.

The resulting LWRM plan serves as a long-term strategic plan for the Land and Water Conservation Department (LWCD), county residents, and partnering state and federal natural resource agencies. The plan directs conservation efforts within the county and assists in forming annual work plans for the LWCD and agencies. It is also used to support applications for conservation grant funds, including annual state grants for county staff and support costs.

At a minimum, a LWRM plan must describe:

- Water quality and soil erosion conditions throughout the county;
- Water quality objectives;
- Key water quality and soil erosion problem areas;
- Conservation practices needed to address water quality and erosion problems;
- A plan to identify priority farms and other sites within the county;
- Strategies to encourage voluntary implementation of conservation practices;
- State and local regulations that the county will use to implement the plan;
- Compliance procedures that apply if enforcement actions occur;
- Multi-year work plan for the LWCD to implement conservation practices and achieve compliance with state runoff management performance standards; and
- How the LWCD will measure and monitor progress on the work plan, provide information and education and coordinate its conservation program with state and federal agencies.

Plan Development with Public Participation

The focus of this plan's development process was to identify and prioritize land and water resource issues to develop a Work Plan that addresses those issues. The Work Plan coordinates agency efforts to conserve the land and water natural resources in the county.

A good start to any planning process is finding out what currently exists. NCWRPC staff collected land and water resource inventories from a variety of sources that were assembled during creation of the County's Comprehensive Plan.

In January 2016, the NPS Regional Contact for the Northern Region of DNR was contacted, and the Water Basin Leader was officially invited to participate in the TAC (email on file).

A Technical Advisory Committee (TAC) of natural resource professionals was invited to review the Resource Assessment (Chapter 3), and to add additional perspective on the inventory and current trends. Those perspectives were provided individually by email, and they were incorporated into Chapter 3. The TAC professionals are listed with their representation on the back of this plan's cover.

The Citizens Advisory Committee (CAC) was a group of residents appointed by the Forest County Land Conservation/Agriculture and Extension (LC/AE) for the plan. CAC members are listed with their representation on the back of this plan's cover. Their first task was to familiarize themselves with the data and professional assessments of the extensive land and water resources they experience every day. On July 13th, 2015, the CAC met and created the following list of Policies & Goals:

- Maintain or reverse eutrophication of our waters.
- Promote Forest Consumption.
- 9 Key elements for impaired waters.
- Shoreland areas – Slow spread of invasive species both aquatic & terrestrial.
- Monitor and/or reduce phosphorus runoff to surface water.
- Look into sufficient recycling sites to allow for composting/brush removal for all towns in Forest County.
- Provide constant/annual up to date landowner information regarding shoreland practices and best management practices.

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On January 13th, 2016, NCWRPC staff reviewed and collected additional policy & goal ideas from the CAC, and then formatted those additional ideas into the following goals and objectives:

Goal: Reverse Eutrophication of Lakes.

(Anticipated Outcome – Swimmable, fishable, and drinkable water.)

Eutrophication is a natural aging process of all water bodies. In Forest County this process is intensified by the heavily vegetated landscape of a transitional or mixed forest. Mixed forests are ecologically the richest on the continent. However, when needles and leaves fall together, they prompt decomposers to produce organic compounds that are not present when either is alone. Eutrophication is accelerated. Lakes are no longer swimmable due to accumulation of sediment, fish no longer have spawning grounds and overall water quality deteriorates with increased nutrient availability causing algae blooms.

Source: Benyus, Janine M. (1989). Northwoods Wildlife: A Watcher's Guide to Habitats. Portland, OR: Book News, Inc.

Objectives

1. Support legislation that allows lake dredging to remove sediment.
2. Create lake bed core sample data repository.
3. Create County Lakes Plan

Goal: Slow the spread of aquatic invasive species.

(Anticipated Outcome – To protect native ecosystems.)

Forest County landowners are beginning to notice the creep of Non-native, aquatic and terrestrial species. Native plant is a term used to describe plants indigenous to a given area in geologic time. This includes plants that have developed, occur naturally, or existed for many years in an area. The native plant species in any particular area of interest are those which arrived, established, and survived there without direct or indirect human assistance. It is obvious that plants accidentally or deliberately imported by people from faraway places are not native, but it is more difficult to determine whether plants in a general region are native to a particular site. Forest County is an example of many plants not being native to this area but now have an important place in our ecosystem. In the first third of the 19th century, much of Forest County was barren by today's standards.

Objective

- Control aquatic, non-native, invasive species.

Activity

- Procure small dredge for countywide use.
- Continue support of WRISC Partnership (multi county, multi state)
- Continued membership in County Lake Association
- Continued involvement with lake association educational activities

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Between January and April of 2016, Forest County staff and NCWRPC staff created the goals and objectives for prioritization at the April 13, 2016 meeting.

During 2016, each LC/AE meeting discussed some aspect of the future County Land and Water Plan.

- March 21st, 2016 Motion to consider and Exclusive Ag Ordinance
- March 21st, 2016 Motion to define the limitations of Concentrated Animal Feeding Operations.
- July 27th, 2016 Consider creating a county wide lake plan

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On April 13th, 2016, the Land Conservation/Agriculture and Extension (LC/AE) Committee reviewed and prioritized the full list of goals and objectives. NCWRPC led a nominal group process to prioritize the goals. The LC/AE Committee thought that the objectives related to each goal were all appropriate, and chose not to prioritize them.

The following goals are in priority order. Their related objectives are not prioritized:

Goal 1: Remove or reduce the causes of lake eutrophication in Forest County.
Anticipated outcome: Restore swimmable near shore conditions. Restore spawning beds for natural fish reproduction. Remove nuisance invasive species.

Objectives:

1. Support legislation that allows lake dredging or vacuum removal of sediment from water bodies by towns, groups or individual property owners in ASNRI areas by general permit.
2. Reduce and remove previously deposited phosphorus and nitrogen from water bodies.
    a. Facilitate cooperation between county, town and lake organizations for permitting of dredge and sediment removal operations.
    b. Make organic materials removed from lake beds available to farmers and gardeners to reduce additional phosphorus and nitrogen requirements in upland areas.
3. Maintain stakeholder status in the Upper Fox and Wolf TMDL Development.

Goal 2: Slow the spread of invasive and non-native nuisance species.
Anticipated outcome: Stabilize the current ecosystem from further advancement of non -native species, terrestrial and aquatic.

Objectives:

1. Assist lake organizations and landowners in mapping the type and quantity of invasive species
2. Assist in the procurement of a vacuum weed harvester for individual or cooperating groups of lakes.
3. Keep lake organizations appraised of grant opportunities
    a. Cooperate with grant applications and information
4. Maintain educational levels for invasive species in the Land and Water Resource office.
5. Participate in/with local and regional groups that monitor and remove invasive species

Goal 3: Increase the amount and quality of information available concerning land and water in Forest County.
Anticipated outcome: More accurate mapping to facilitate proper ordinance development and land use procedures.

Objectives:

1. Procure LIDAR for Forest County
    a. Assist lake organizations with information to complete plans and applications
    b. Assist Towns and landowners with proper infrastructure placement to prevent erosion and flooding.
    c. Provide a platform for FEMA to update Forest County floodplain mapping
    d. Assist landowners with accurate placement of structures to avoid floodplains and wetlands.
2. Create legal mapping for ordinances with parcel based GIS.
    a. Maintain educational requirements for GIS data base in county offices.
3. Assist or partner with the Fox –Wolf Watershed Alliance working toward watershed recovery starting with Pine and Arbutus Lakes.

(Objective #4 was added by LC/AE over the 2016/2017 winter.)

4. Create county wide lake plan to streamline grant proposals

Goal 4: Reduce phosphorus and nitrogen loading to surface waters.
Anticipated outcome: Slow eutrophication of surface waters

Objectives:

1. Create farmland preservation ordinance to protect surface and ground water from concentrated animal housing/feeding operations.
2. Monitor and reduce runoff to surface waters.
    a. Educate landowners as to shoreland best management practices
3. Monitor and inspect existing sanitary systems.
4. Create database of sediment samples from impaired lakes.

Goal 5: Promote well planned development.
Anticipated outcome: Protect property values of the remaining privately owned land in Forest County.

Objectives:

1. Revise the County Comprehensive Plan to address dwindling tax base.
2. Create Farmland Preservation Zoning ordinance to protect the livability of existing residential homes.
3. Adopt flood shadow for Bog Brook and Pine Lake as necessary
4. Update all ordinances and provide information to landowners
    a. Shoreland
    b. General zoning
    c. Subdivision
    d. Mining
5. Create wetland bank from tax delinquent or available properties

a. Create SAMP (special area management plan) for certain wetland types.

b. Work toward administrative scenarios to make "whole" landowners that find themselves with properties that are considered totally wetland and are lots of record.

6. Scan all permits to GCS to maintain an environmental database.

Goal 6: Maintain a healthy and vigorous forest.
Anticipated outcome: Promote sustainable silvilcultural activities in Federal, State and private forests that protect forest health and the economic stabilization of the industry.

Objective:

1. Create a governmental/county interface with USFS (United States Forest Service) to implement and expand the "Good Neighbor Agreement "

2. Continue to implement the 15-year County Forest Land Use Plan.

(Objectives #3 through #5 were added by LC/AE over the 2016/2017 winter.)

3. Encourage a variety of economic opportunities related to forests, forestry, and forest-based products.

4. Promote sustainable forestry practices on both private and public lands to maximize residual stand quality and promote abundant regeneration of a range of tree species.

5. Promote healthy and protected forest ecosystems to serve a multitude of ecological roles that include habitat for animal and plant species and water quality protection.

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In May 2016, the CAC informed staff that a strong connection needed to be made that sustainable yield tree harvest is as an agricultural crop.

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Over the summer of 2016, the Land and Water Conservation Department updated the Work Plan achievements and NCWRPC revised the Resource Assessment chapter per the TAC and CAC comments and priorities.

Over the summer of 2016, the Land and Water Conservation Department and NCWRPC created draft chapters for the TAC members to review. Suggested changes from TAC members were incorporated into the final chapters.

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Over the winter of 2016/2017, the Land Conservation/Agriculture and Extension (LC/AE) Committee added the following objectives:

- Under "**Goal 3: Increase the amount and quality of information available concerning land and water in Forest County."** the following objective was added:

    4. Create county wide lake plan to streamline grant proposals.

- Under "**Goal 6: Maintain a healthy and vigorous forest."** the following objectives were added:
    3. Encourage a variety of economic opportunities related to forests, forestry, and forest-based products.
    4. Promote sustainable forestry practices on both private and public lands to maximize residual stand quality and promote abundant regeneration of a range of tree species.
    5. Promote healthy and protected forest ecosystems to serve a multitude of ecological roles that include habitat for animal and plant species and water quality protection.

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At the LC/AE Committee's June 2, 2017 meeting they:

- Approved the draft plan for public hearing review.
- Set the public hearing to be July 11, 2017 at 5:00 pm.

As part of the public hearing review, DATCP, DNR, and other agencies were notified of the draft plan and when to provide comment by. During this review, DATCP noted areas of the plan that needed additional information; and DNR provided comments to improve the plan.

Staff decided to cancel the public hearing to incorporate the changes.

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At the LC/AE Committee's July 18, 2017 meeting they:

- Provided direction to staff with improving the Plan, based upon agency comments received.

Additional detail was added to the Plan's text:

- Chapter 3 (Resource Assessment) received revised data in Table 1 to better reflect actual and historical acreages.

- Chapter 3 (Resource Assessment) received revised data in Table 2 to better reflect actual and historical acreages.

- Chapter 3 (Resource Assessment) received additional text to better describe the main objectives of forest management in the Chequamegon-Nicolet National Forest (CNNF).

- Chapter 3 (Resource Assessment) received additional text explaining why some of the waters are impaired.

- Chapter 3 (Resource Assessment) received an additional table (Table 4) describing sediment samples that were taken.

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At the LC/AE Committee's August 2017 meeting they:

- Approved plan changes; and
- Set the public hearing for September 6, 2017.

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The Public Hearing was held at 5:00 p.m. on September 6, 2017, and the LC/AE met directly after the public hearing.
Only editorial changes (e.g. spelling or clarification) were noted during the public hearing by county staff; all of which were approved by consensus.

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On October 3, 2017, the Land and Water Conservation Board (LWCB) in Madison is scheduled to recommend this plan for approval.

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The County Board is scheduled to adopt this plan October 17, 2017.

RESOURCE ASSESSMENT
Chapter 3

Forest County is aptly named for its most prolific resource – the forest. Of the approximately 700,000 acres in the County, about 88% is covered by forest. About 82% of the county is publicly owned land, including about 49% of the county in the Chequamegon-Nicolet National Forest. The topography of Forest County is of glacial origin, and is underlain by bedrock that makes up the southern extension of the Canadian Shield.

Surface water is used mainly for recreation, wild ricing, fishing, wildlife, and residential development occurs along the shorelines. Lakes and rivers cover about 3% of the county. There are about 161,000 acres of mapped wetlands of 5 acres or more. Many more wetlands are only airphoto approximated. More than 850 miles of streams crisscross the county in 9 watersheds.

Agriculture exists on about 2% of the land throughout Forest County, mainly of forage crops, animal husbandry, and various other uses. Only two agricultural facilities employ irrigation – one uses two 1,000 gallon per minute wells, the other uses a 5 gallon per minute well. Eight high capacity wells exist in Forest County for drinking water, not including Tribal installations.

The lakes and forests entice people to come *Up North* to buy a "cabin" or to build their retirement home. About 51% of housing in the county consists of vacation homes.

In general, the usual sources of water degradation—such as overdevelopment, poor forestry practices, failing septic systems, and erosion—are not present in Forest County to a measurable extent. Most development on lakes took place after size requirements were instituted. Wetlands along lakeshores filter groundwater and preclude further development for long stretches of shoreline. These same wetlands act as a buffer between waterbodies and the few active farms in the County. Sanitary systems are inventoried and inspected regularly for adequate separation to groundwater. Failing systems are identified and forcefully replaced. The county's lakeshores and surrounding areas are well vegetated. Poor forestry practices are a thing of the past as professional loggers now dominate the job market. Certification is required for most logging jobs. Erosion into water bodies during construction has been curtailed by instituting the Uniform Dwelling Code for all new construction, but continued vigilance is necessary. Spring runoff over frozen ground remains a source of water degradation and shoreline alterations can be designed to divert water for retention and later infiltration.

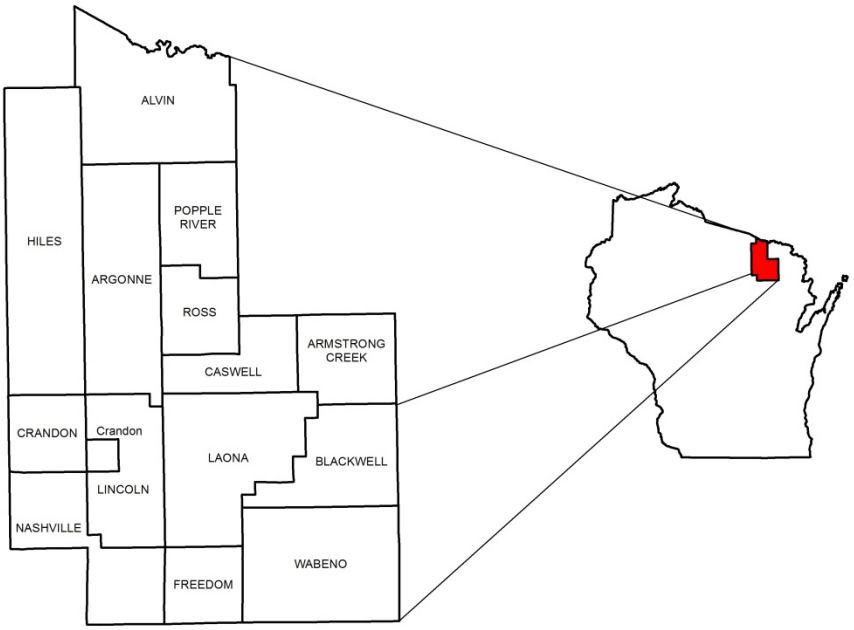
Location/Geography

Forest County is located in northeastern Wisconsin. See **Figure 1**. The City of Crandon is the county seat and is the only incorporated municipality. Laona and Wabeno have commercial main streets but are not classified as urban.

The county is bounded on the north by Upper Peninsula of Michigan and the Brule River, which forms the Wisconsin–Michigan Boundary; on the east by Florence and Marinette Counties; on the south by Oconto and Langlade Counties; and on the west by Oneida and Vilas Counties.

The topography of Forest County is of glacial origin, and is underlain by bedrock that makes up the southern extension of the Canadian Shield. Gravel is a common product. Metallic minerals have long been a contentious land use issue. Many township would welcome mining and others would not.

Figure 1 **Forest County Location**



Previous Reports Summarized

Plans that were used to make this LWRM Plan are summarized below:

County Forest Comprehensive Land Use Plan 2006–2020
Contact the Forest County Forestry Department to access this plan.

This plan incorporates or references all county forest policies, pertinent county ordinances, planning documents, and the needs and actions to occur from 2006 to 2020. Specific flora and fauna within the county forest are described in this plan.

Forest County Comprehensive Plan 2011-2021
http://www.ncwrpc.org/forest/forestcp.html.

The comprehensive plan is a combination of nine chapters—Issues & Opportunities; Natural, Cultural, & Agricultural Resources; Housing; Transportation; Economic Development; Land Use; Utilities & Community Facilities; Intergovernmental Cooperation; and Implementation. Zoning and subdivision ordinances must be consistent with the comprehensive plan. An extensive inventory of natural and agricultural resources exists in this plan for use in the LWRMP.

In 2015, the *Forest County Farmland Preservation Plan* was created and amended to the Comprehensive Plan. The Farmland Preservation Plan updates and expands agricultural information within the Comprehensive Plan.

NRCS Soil Survey for Forest County, 2004
http://soils.usda.gov/survey/online_surveys/wisconsin/

The Natural Resource Conservation Service (NRCS) is a federal agency that prepared the Forest County, Wisconsin Soil Survey. The survey contains predictions of soil behavior for selected land uses and also highlights the limitations and hazards inherent in the county's soil. A series of detailed maps identifying the location of soil types in Forest County accompanies the survey.

The *Geology & Soils* section of the LWRM Plan was based on this Soil Survey.

General Land-Use

As the county's name implies, the majority of Forest County is forest covered, and sparsely populated. Forest County has a total area of just under 700,000 acres. Table 1 shows the relative sizes of each land assessment throughout the County. Crandon is the only incorporated community, but main streets also exist in Wabeno and Laona. Most residential parcels are large lots in rural settings. See Map 1.

Table 1

clasification	class	Acres 2000	Acres 2005	Acres 2010	Acres 2017
Residential	1	14,616	15,693	17,249	17,171
Commercial	2	968	1,033	1.032	1,105
Manufacturing	3	350	382	394	298
Ag	4	18,561	19,485	18,459	18,874
Undeveloped	5	19,132	18,691	20,195	20,821
Ag forest	56	0	5,530	6,000	6,259
Productive Forest	6	80,966	64,019	57,868	55,042
other	7	599	416	458	358
MFL all	1 to 9	131,561	140,745	143,951	136,551
Federal	ex 1	357,488	358,254	358,820	362,415
state	ex 2	22,937	23,376	23,958	27,024
county	ex 3	529	624	609	1,966
other	ex 4	5,043	5,049	5,575	5,095
		652,750	653,297	653,537	652,979
Native total (DOA)					16,812
					669,791
					1446 sq mi

Source: Forest County Database 2017

Actual land use demands for residential, commercial, and industrial uses total 2,555 acres from 2000 to 2017. Agricultural land demand has risen slightly over the last 15 years so should remain stable, or even increase depending on the market.

The following is a brief description of the major land uses and their trends in Forest County.

Agriculture
Forest County recognizes that the forest resource is their #1 agricultural crop.

The most productive agricultural areas are fields in the Towns of Armstrong Creek and Nashville. Areas that are mostly flat and conductive to the use of large farm machinery and the efficient application of chemicals are used for row cropping. Areas with high water tables, and steep slopes are less productive for row crops, but are suited well for forage and managed pasture. There are still many farms that can make use of small irregular shaped parcels

if they are located in close proximity. Irrigation equipment is not a common sight in Forest County since most crops are forage crops that do not need irrigation.

Table 2 provides real time agricultural data regarding the total amount of farmland in Forest County. A small increase in total farm acres is noted between 2000 and 2017. Productive forests have decreased due to management under the State's MFL program.

Table 2	**Agricultural Acreage in Forest County**				
Classification	Class	2000 acres	2005 acres	2010 acres	2017 acres
Ag	4	18,561	19,485	18,459	18,874
Ag forest	5M	0	5,530	6,000	6,259
Productive forest	6	80,966	64,019	57,868	55,042

Source: Forest County Land Records

A brief description of soils and their limitations for cropland and pasture is described at the end of this chapter under **Geology & Soils**.

Forestry

Forest County is characterized by well developed public and private forests with a mixture of hardwoods and conifer stands. In 2010, about 88% of the county was forestlands.

As of 2016 Under the Forest Crop Law (FCL) and Managed Forest Law (MFL) there are about 90,000 acres open to the public, and about 33,700 acres closed to the public. *The public shall review official records to determine what uses are allowed on open parcels based upon if they are FCL or MFL before using those parcels.*

The Chequamegon-Nicolet National Forest contains 55% of the forestland in Forest County. Private landowners own 18% of the forestland, and the remaining 15% of the forestland is owned by Forest County, school districts, local municipalities, Board of Commissioners of Public Lands, and state forest.

Each Forest County Legacy Area is summarized below with 5 stars representing the highest level for that category:

CN Chequamegon-Nicolet National Forest

Size	Large
Protection Initiated	Substantial
Protection Remaining	Limited
Conservation Significance	☆☆☆☆☆
Recreation Potential	☆☆☆☆☆

PE Peshtigo River

Size	Large
Protection Initiated	Substantial
Protection Remaining	Moderate
Conservation Significance	☆☆☆
Recreation Potential	☆☆☆☆☆

LH Laona Hemlock Hardwoods

Size	Small
Protection Initiated	Limited
Protection Remaining	Substantial
Conservation Significance	☆☆☆☆
Recreation Potential	☆☆

UP Upper Wolf River

Size	Large
Protection Initiated	Substantial
Protection Remaining	Moderate
Conservation Significance	☆☆☆☆☆
Recreation Potential	☆☆☆☆

Other Areas of Interest includes:

- North Otter Creek
- Elvoy and Brule Creeks

The Laona Hemlock Hardwoods (LH) are locally known as the Connor Forest. It is interesting to note that the Connor Forest (Laona Hemlock Hardwoods) has been managed longer than the Nicolet side of the Chequamegon-Nicolet National Forest (CNNF).

The main objectives of forest management are: Sustain the health, diversity, and productivity of the CNNF to meet the needs of present and future generations.

The CNNF is mandated by law to provide a multitude of ecosystem services to society which includes watershed protection, plant and animal habitats, cultural history, recreation, wood products, and research and demonstration. These services allow for a large number of customary use rights on the land base such as timber harvesting and recreation. Recreational activities include hunting and angling, hiking, cross-country skiing, ATV and snowmobile use, as well as a number of non-consumptive activities such as wildlife watching, wilderness exploration, picnicking, swimming, and camping.

The forest is composed of upland: 44% hardwood, oak, hemlock; 39% aspen, balsam fir, paper birch and jack pine; 14% red and white pine and 3% upland opening. The lowland is 50% conifer, 38% open and 12% hardwoods.

Estimate of maximum sustainable yield for main commercial species is 251 MMBF in the Long Term Sustained Yield while 131 MMBF is the Allowable Sale Quantity. These numbers represent only the portion of the forest that is set aside for timber production. Greater portions of the forest are set aside for

other environmental concerns. In the past 10 year period, yields decreased to 58 MMBF per year. In the past year, yields have increased to 115 MMBF per year due to the advocacy of the Federal Sustainable Forestry Committee.

Source: Smartwood Test Evaluation of CNNF, R Krawze, FSFC member.

Transportation

Farm-to-market roads, commodity storage, processing plants, and implement repair or sales locations are the most significant farming and logging infrastructure. County Highways have all been upgraded to handle heavy agricultural loads at most times of the year; with spring thaw being most disruptive for logging operations when weight restrictions are placed on local roads. Processing and storage of agricultural products for Forest County can be in any area of the county, if only for a short time, therefore quality roads are absolutely necessary to the farmer and logger.

Residential Development

Parts of the county have seen strong growth in the number of housing units constructed, with much of this growth in seasonal and recreational properties. Much of the highest value housing property is concentrated around Crandon in the Towns of Lincoln and Nashville.

Forest County experienced a 7.8% increase in the number of housing units from 2000 to 2010 – most of which were vacation homes but most are built for all season occupancy. This is a considerable increase relative to the 7.2 percent decrease in population during the same time period.

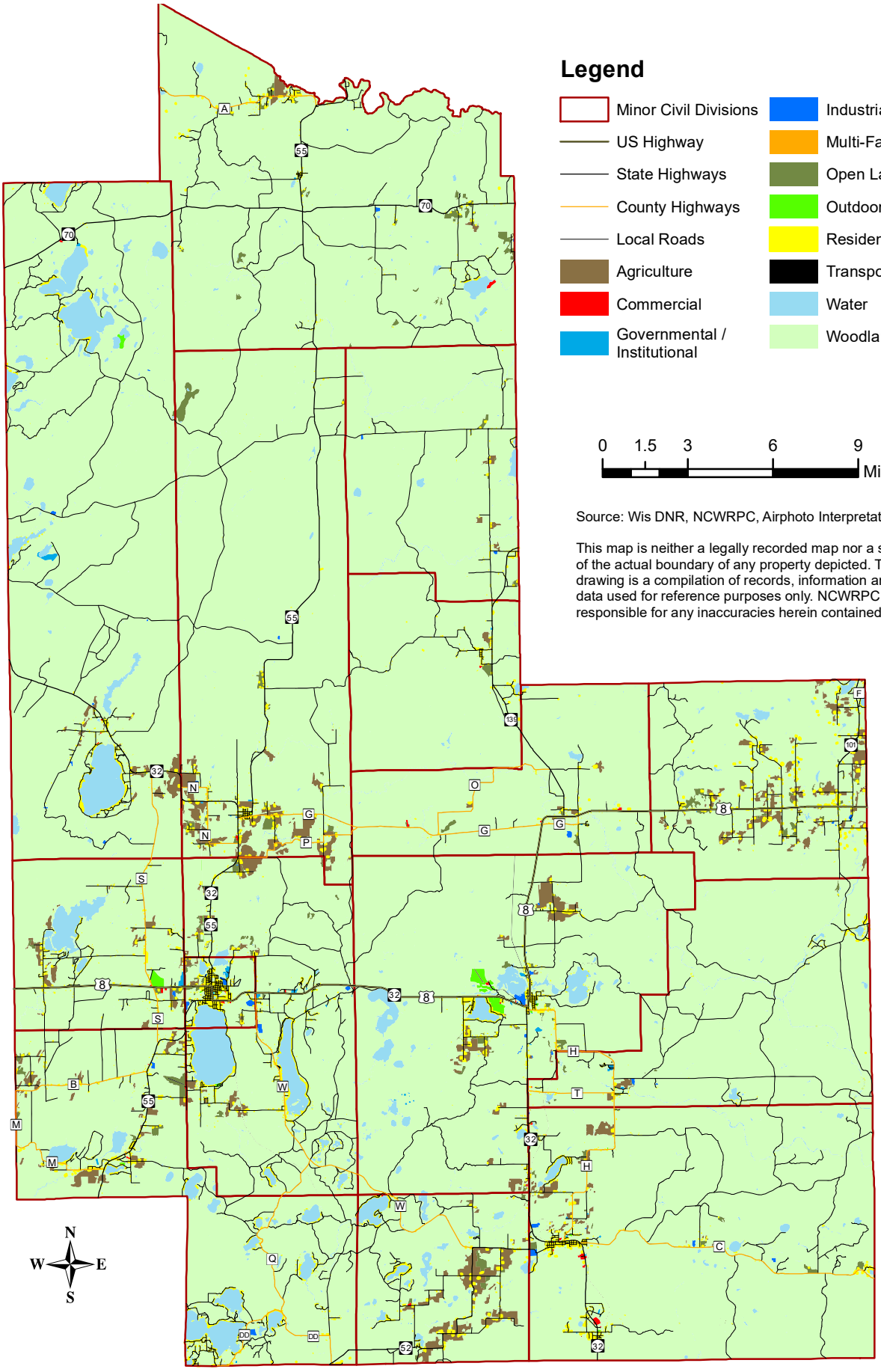
Commercial & Industrial Development

Commercial and industrial development in Forest County is a relatively small land use, and projected employment growth will not use much additional land.

The Public Administration, Leisure & Hospitality, and Education & Health Services sectors have the largest share of jobs in Forest County. Together, these sectors accounted for over 67 percent of jobs in 2014. The Public Administration sector had the largest increase from 2013 to 2014 with a gain of fifty-three workers. The Manufacturing sector had the largest proportional increase with 10.7 percent increase in the number of jobs. However, most sectors have declined.

Forest County, WI

Generalized Land Use Map 1



Source: Wis DNR, NCWRPC, Airphoto Interpretation 2010

This map is neither a legally recorded map nor a survey of the actual boundary of any property depicted. This drawing is a compilation of records, information and data used for reference purposes only. NCWRPC is not responsible for any inaccuracies herein contained.

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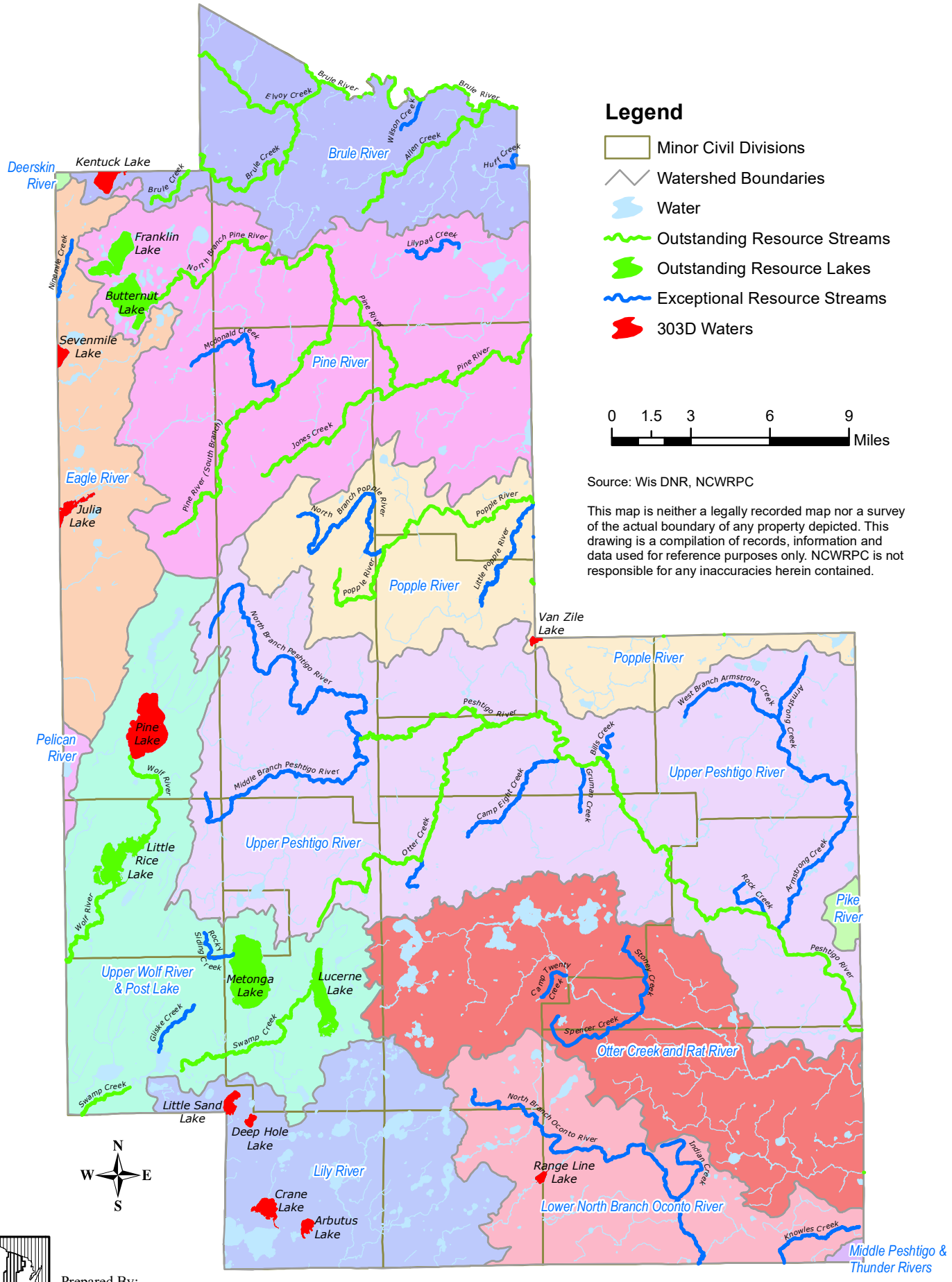
Forest County, WI — Water Features — Map 2



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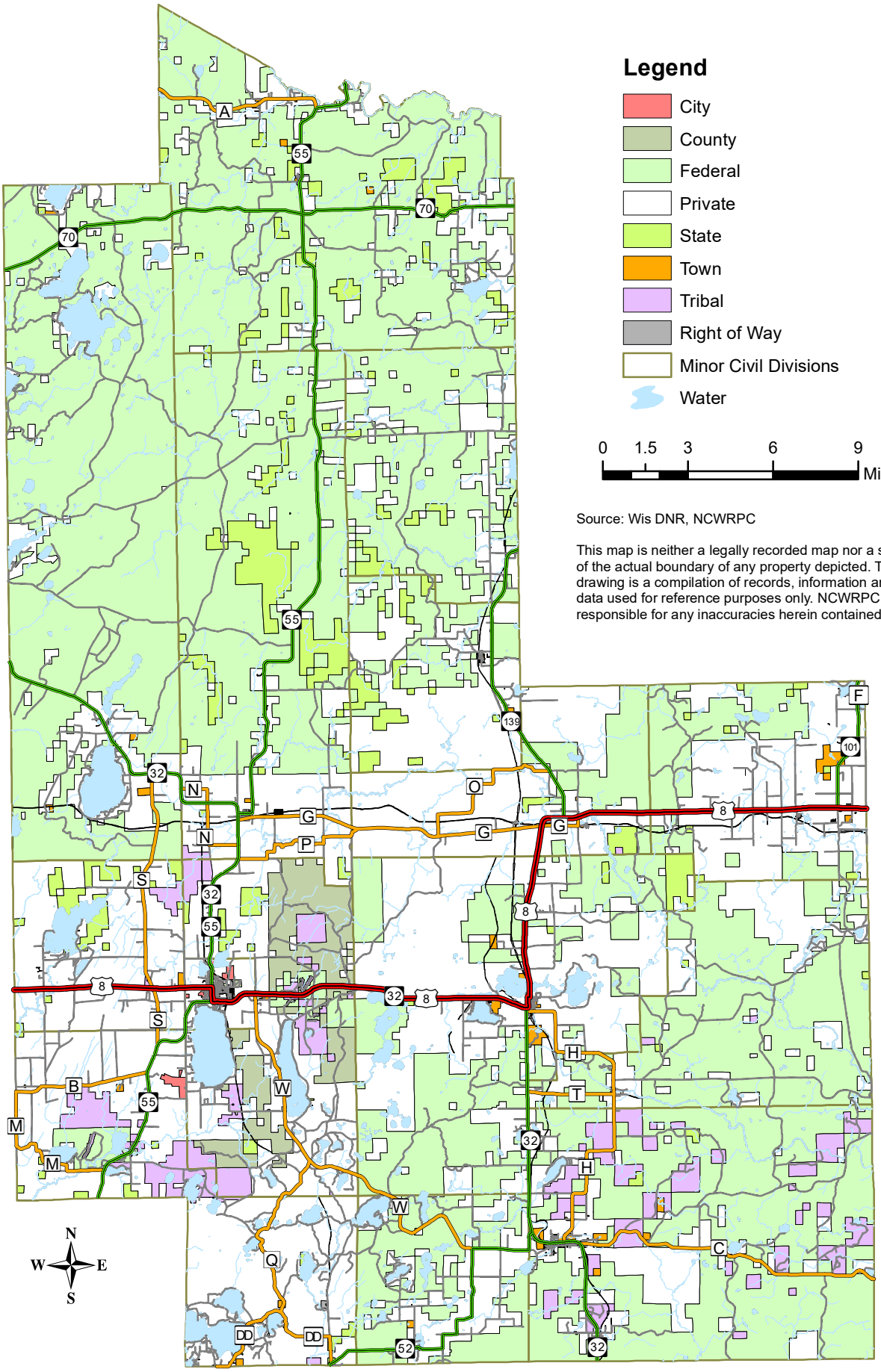
Forest County, WI — Land Ownership — Map 3



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Surface Water

Forest County has 728 lakes covering 22,324 acres, and streams with a total length over 710 miles and a surface area of about 1,770 acres. The majority of these streams are classified as trout waters. Surface water is used mainly for recreation, and wildlife. Watersheds are shown on Map 2.

While there are 728 lakes in Forest County, only 207 have names. Of those 207 named lakes, 139 are less than 50 acres, 28 are 50 to 100 acres, 18 are 101 to 250 acres, 12 are 251 to 500 acres, 3 are 501 to 1,000 acres, and 7 are 1,001 acres and over. These lakes total 22,749 acres, with the remaining 627 un-named lakes totaling less than 850 total acres.

In 1977, the surface waters of Forest County were inventoried. At that time 408 lakes were completely surrounded by public ownership. Since that time, additional public shorelands have been added.

Of the larger lakes of more than 1,000 acres, four have fully developed shorelines with little or no upland development – Lakes Metonga, Lucerne, Pine, and Pickerel. Two of the larger lakes over 1,000 acres, Little Rice and Butternut, have very limited private development since most of the land surrounding these lakes is public.

Lake Metonga, the largest lake in the county at 2,038 acres, is a medium hard water drainage lake having slightly alkaline, clear water of very high transparency. The entire shoreline is upland of mixed hardwoods and conifer. Lake Metonga is considered an Area of Special Natural Resource Interest. It does however host a variety of invasive species such as Eurasian Water-Milfoil, Rusty Crayfish, and Zebra Mussel.

Pine Lake, on the northern border of the Wolf River watershed, has been listed as impaired (on the 303(d) list). It is a 1,673 acre soft water drainage lake having slightly alkaline, clear water of moderate transparency. The immediate shoreline is predominantly upland, consisting of hardwoods and conifer with the remaining being wetland of conifer and shrub. Eurasian Water-Milfoil has been found in its waters. Pine Lake in 2008 was classified as in the middle of mesotrophic and eutrophic.

Lake Lucerne is a 1,039 acre soft water drainage lake, having slightly acidic clear water. The entire shoreline is wooded upland of hardwoods and conifers. It consists of two very different sections divided by a group of islands. The southern quarter is quite shallow and relatively fertile from an aquatic standpoint. Most of the remaining area north of the islands is at least twenty-five feet deep. The bottom is predominantly large rocks and borders with very little vegetation. Lake Lucerne is identified as an “outstanding water resource.” Rusty Crayfish and Phragmites have been recently verified to exist in this lake.

Of the three lakes profiled above, the two with the largest population and the most shoreline development are still considered oligotrophic and Areas of Special Natural Resource Interest.

The Eastern Continental Divide directs the flow of surface water in Forest County into two major bodies of water – Green Bay and the Mississippi River. The vast majority of the surface water in Forest County flows to the east and southeast and eventually into Green Bay. Three major rivers – the Brule, the Pine, and the Popple – flow in that direction and are part of the Menominee River watershed. Both the Pine and Popple Rivers are designated as "wild rivers" (§ 30.26 WI Stats.).

The Peshtigo River and its feeder streams encompass the largest watershed in the county. This river flows to the southeast and enters Green Bay in southeastern Marinette County. The Fox River, whose headwaters originate at Pine Lake, flows southward into Lake Poygan in Winnebago County, for the Fox River watershed. Several small streams on the far western edge of the county flow to the west and are part of the Wisconsin River watershed.

The secondary drainage system in Forest County consists mainly of surface runoff and hillside seepage into basins and depressions caused by the last glacial period. Some of these areas have drainage outlets, but most of this system tends to be poorly developed, which is a natural state.

Surface water is an important resource to Forest County, however it can be threatened by both point and non-point source pollution. Nonpoint source pollution, often the result of stormwater or meltwater runoff and erosion, is pollution that cannot be traced to a single source, and can come from roadways, parking lots, farm fields, construction sites, fertilized lawns or dense mature mixed forests. All runoff, if left un-infiltrated, and allowed to enter waterways, has the potential to introduce nutrients to the waterbody.

The Wisconsin State Legislature created the Wisconsin Nonpoint Source Water Pollution Abatement Program (NPS) in 1978 (§281.66, Wis. Stats.). The goal of the NPS Program is to improve and protect the water quality of streams, lakes, wetlands, and groundwater by reducing pollutants from agricultural and residential non-point sources. The WDNR and DATCP administer the program, which focuses on critical hydrologic units called priority watersheds. The program is implemented through priority watershed projects led by local units of government. Landowners, land renters, counties, cities, villages, towns, sewer districts, sanitary districts, lake districts, and regional planning commissions are eligible to participate.

Overall, there are no major or widespread water quality problems regarding Forest County surface waters that can be controlled within Forest County other than

surface runoff. In Table 3 the impairment of "excess algal growth" is caused by an "unknown" pollutant. That "unknown" pollutant is locally speculated to be decaying organic matter ("legacy sediment"), which is deposited on lake beds, impairs navigation, and smothers fish spawning grounds.

Pollution of surface water in Forest County generally occurs from mercury deposition, the source of which is coal fired power plant emissions outside of Forest County. Pollution of surface water generally is minimal because the county is relatively undeveloped and there is little municipal or industrial waste. Even though the lakes of Metonga (2,038 acres) and Lucerne (1,039 acres) have nearly 100% of their shorelines developed, both lakes are listed as "outstanding resource waters."

Streams throughout the County exhibit good water quality with the majority supporting cold water fish communities and warm sport fish communities. 20 lakes in Forest County are currently stocked. Lakes that have traditionally supported natural reproducing walleye populations are on the decline; some due to spawning habitat degradation others due to the introduction of rainbow smelt or bull heads. *Source: Greg Matzke WDNR Fish Biologist.*

Basin & Watersheds

There are 13 watersheds contained completely or partially within Forest County as shown on Map 2. The Eastern Continental Divide directs flow of surface water in Forest County into two major bodies of water, Green Bay and the Mississippi River. The vast majority of the surface water flows east and southeast to Green Bay. The secondary drainage system in Forest County consists mainly of surface runoff and hillside seepage into basins and depressions. Some of these areas have drainage outlets.

Impaired Waters – 303(d) Waters

The DNR maintains a list of surface waters that do not meet specific water quality standards outlined by section 303(d) of the Clean Water Act. The DNR is required to update the list every two years. Table 3 shows the 2016 list with proposed waterbodies.

Table 3 Impaired Waterbodies in Forest County

Name	Pollutant	Impairment Indicator	Priority
Arbutus Lake	Mercury	Contaminated fish tissue	Low
Bear Lake *	Unknown	Excess algal growth	Low
Crane Lake	Unknown	Excess algal growth	Low
Deep Hole Lake	Mercury	Contaminated fish tissue	Low
Julia Lake	Mercury	Contaminated fish tissue	Low
Kentuck Lake	Mercury, & Total Phosphorus	Contaminated fish tissue, and excess algal growth	Low
Lily River *	Unknown	Elevated water temp.	Low

Little Rice Lake	Mercury	Contaminated fish tissue	Low
Little Sand Lake	Mercury	Contaminated fish tissue	Low
Pine Lake	Unknown	Excess algal growth	Low
Range Line Lake	Unknown	Excess algal growth	Low
Sevenmile Lake	Total Phosphorus	Excess algal growth	High**
Van Zile Lake	Mercury	Contaminated fish tissue	Low

Source: WDNR. *Proposed for list in 2016. **Status: TMDL Development

Impaired surface waters have been identified in areas associated with private land. These impairments are classified as "unknown". Those same indicators of impairment exist in water bodies where little or no human occupation exists and are less well documented; indicating other, less apparent, reasons exist for impaired water quality.

Source: Tyler Wagner et. al. "Quantifying sample biases of inland lake sampling programs in relation to lake surface area and land use/cover." Springer Science + Business Media, 28 August 2007, online.

Kentuck Lake and Sevenmile Lake are both Two-Story Fishery Lakes (defined on page 16 of the 2018 WisCALM document. As Two-Story Fishery lakes their Total Phosphorus criteria is 15 ug/L. For both lakes the assessed total phosphorus (TP) data clearly exceeded the criteria and were therefore designated as impaired for TP. The impairment of "Excess algal growth" was determined by evaluating chlorophyll-a concentration in the lake. The percent of days where algal levels are above nuisance levels (20 ug/L) were calculated. For both of these lakes the criteria is: there should be no more than 5% of days (July 15 – Sept 15) where algal levels are 20 ug/L or higher. Kentuck Lake exceeded this criteria, but Sevenmile Lake did not. Sevenmile Lake is listed for the pollutant of Total Phosphorus with Impairment Unknown.

Source: Ashley Beranek, Water Evaluation Section, DNR Madison.

DNR's use of "Pollutant Unknown" in Table 3 means that the cause of the impairment has not been determined yet. This usually occurs for lakes with an exceedance of the chlorophyll-a criteria, but not the total phosphorus criteria. It's possible that the unknown pollutant could be decaying organic matter, but it cannot be stated with certainty without a pollutant determination process, which would occur in advance of a TMDL being developed.

Source: Ashley Beranek, Water Evaluation Section, DNR Madison.

In 2016 landowners were asked to take random sediment samples from their near shore areas as these lakes had numerous complaints concerning sediment. Samples were dried and sent to AgSource to get a general idea of the composition of sediment in different areas of the county. Results are compiled in Table 4.

Table 4	**Sediment Samples**				
Site Name	% or organic	Nitrogen pr/ton	Phosphorus pr/ton	Potassium pr/ton	Sulfur pr/ton
Pine Lake	50.33	8.8	1.65	0.82	2.01
Roberts Lake	55.79	48	2.18	0.23	15.82
Windfall Lake	27.05	24.2	2.56	0.5	13.98

Source: Forest County citizens 2016, Forest County Land Conservation

Outstanding/Exceptional Resource Waters

Wisconsin has designated many of the state's highest quality waters as Outstanding Resource Waters (ORWs) or Exceptional Resource Waters (ERWs). Waters designated as ORW or ERW are surface waters which provide outstanding recreational opportunities, support valuable fisheries and wildlife habitat, have good water quality, and are not significantly impacted by human activities. ORW and ERW status identifies waters that the State of Wisconsin has determined warrant additional protection from the effects of pollution. These designations are intended to meet federal Clean Water Act obligations requiring Wisconsin to adopt an "antidegradation" policy that is designed to prevent any lowering of water quality – especially in those waters having significant ecological or cultural value.

Outstanding Resource Waters (ORW) in Forest County include:

2011 - 5 lakes, 4 creeks, and 8 rivers.
2016 - 5 lakes, 6 creeks, and 8 rivers.

Lake Metonga and Lake Lucerne, the two most developed lakes in the County, are both ORW. Residential shoreline development almost completely surrounds both lakes.

Exceptional Resource Waters (ERW) in Forest County include:

2011 – 19 creeks, and 5 rivers.
2016 – 22 creeks, and 6 rivers.

Designation as an ORW or ERW has implications for permitting, in order to protect the quality of the waterway.

- Point source discharges must meet background water quality, except in specific cases on ERW.

- A general or individual permit is required for various waterway alteration activities.
- Increased environmental review is required for high capacity wells near ORW/ERW.

A list of ORWs & ERWs are in Attachment A and shown on Map 2.

Groundwater

Groundwater resources supply most of the water needs in Forest County. It is readily available in quantities necessary to meet domestic, agricultural, municipal and industrial needs. The depth to groundwater below the surface depends on the general topography, elevation above the permanent streams level, and the lithology of the underlying bedrock and glacial deposits. Large yields of ground water are available where the thickness of the saturated drift is at least 50 feet. The glacial drift produces well yields ranging from 5 to 1,000 gallons per minute. Yields of at least 500 gallons per minute are common. Most high-capacity wells are 30 to 300 feet deep. Precambrian crystalline rock underlying the county is not considered a significant source of water. The availability of water from the bedrock is difficult to predict and is probably less than 5 gallons per minute. The glacial drift aquifer above the bedrock is the best source of ground water. (Soil Survey)

The areas that have sandy soils and shallow depth to groundwater are more susceptible to groundwater contamination. Contamination of groundwater reserves can result from such sources as percolation of water through improperly placed or maintained landfill sites, private waste disposal located near the water table, leaks from sewer pipes, and seepage from mining operations into the aquifer. Runoff from livestock yards, urban areas, and improper application of agricultural pesticide of fertilizers can also add organic and chemical contaminants in locations where the water table is necessary to ensure adequate amounts of suitable water to domestic, agricultural, and industrial users.

<u>Groundwater quality summary (Source: WI Well Water Viewer, 2016):</u>

- 99% of 328 private well samples collected met the health-based drinking water limit for nitrate-nitrogen. Meanwhile the other 3% are considered unsuitable for consumption by infants and women who are pregnant or trying to become pregnant because they contained greater than 10 mg/L of nitrate-nitrogen.
- Limited data exists concerning the extent of arsenic in Forest County's groundwater. None of the 17 samples collected were greater than what is considered a suitable concentration of arsenic in drinking water.

- 43% of 244 private well samples reported concentrations of total hardness less than 100 mg/L as $CaCO_3$. Total hardness is not a health concern, however can be important for understanding other characteristics of the water. Water with levels of total hardness less than 100 mg/L tend to be more corrosive. Corrosive water is more likely to corrode metal plumbing and various metal water heater components. Only 13% would be considered hard water (greater than 200 mg/L). Hard water as opposed to corrosive water has a greater tendency to form scale.

Potential sources of groundwater contamination summary:
Very few pollution sources exist in Forest County, because most of the County is in a natural state under forest cover.

- In 2011, there were 10 open-status sites in Forest County that have contaminated groundwater and/or soil; now in 2016, there are 7 sites. These sites are composed of 5 Leaking Underground Storage Tank (LUST) sites and 2 Environmental Repair (ERP) sites. See Attachment B for list.
- No atrazine prohibition areas; no concentrated animal feeding operations; no licensed landfills; no closed landfills are leaking; and no Superfund sites.

Private Onsite Wastewater Treatment System (POWTS)
Wis. Admin. Code chapter SPS 383 regulates private septic or sanitary systems.

Counties are tasked by the state with monitoring all sanitary systems. Forest County is currently creating an inventory of every habitable structure in the county as required. Each year, the county adds 300 to 400 un-documented systems to the inventory and then on to the maintenance list. There are not enough licensed people to do the work, so sanitary system compliance checks are prioritized. Impaired lakes were sent to the top of the list, and outlying areas are secondary.

Geology & Soils

Forest County is located entirely in the Northern Highlands physiographic region, which was glaciated during the Pleistocene Age by the Langlade Lobe. Most of the soils formed under forest vegetation, which results in a light-colored soil that has a relatively low content of organic matter. This soil layer is typically 35 inches deep throughout the county, with glacial till underlying the soil.

The parent material of the soils in Forest County are mainly glacial till or glacial mudflow sediment, glacial outwash, and lacustrine deposits, which in

places are covered by a thin layer of silty or loamy windblown material. Some of the soils formed in more recent deposits of organic material or alluvium. Glacial till ranges from 30 to 300 feet in depth throughout the county, and most high-capacity wells are found in these depths.

The Langlade Lobe was the latest advance of glacial ice that moved over most of Forest County from northeast to southwest. Drumlins left behind by the Langlade Lobe are cored with sand and gravel that have been overlain by glacial mudflow sediment. Another feature left by the Langlade Lobe is the Laona moraine, which is just north of Laona. This moraine is composed mostly of hummocky sand, gravel, and mudflow sediments. Throughout the county are areas of pitted and hummocky sand and gravel deposits.

Forest County is underlain by middle Precambrian igneous (granite) & metamorphic (gneiss and quartzite) bedrock that makes up the southern extension of the Canadian Shield. The bedrock surface is irregular throughout the county and slopes generally to the east and southeast. When this granite, gneiss and quartzite bedrock weathers, sandy soils are the result.

Limitations for cropland and pasture

The soils in Forest County have potential for increased production of crops. Food production could be increased by extending the latest crop production technology to all cropland in the county. Some acreage currently being used as woodland could be used for crop production. However, climatic conditions and market availability make this unlikely.

Water erosion is generally a hazard in areas where the slope is more than about 2 percent. Much of the acreage in Forest County is susceptible to water erosion, but most of this acreage has a protective cover of vegetation. Erosion is a concern in areas where erodible soils are used for row crops.

Soil blowing is a hazard on many of the soils in Forest County, especially the sandy soils. Windbreaks help to prevent the damage to soils and crops caused by soil blowing, and they also conserve soil moisture. Small grain crops can be planted as a cover, and green manure crops and a system of conservation tillage can be used to maintain surface cover, maintain the content of organic matter, and reduce the hazard of soil blowing.

Soil drainage is a major management concern in some of the crop and pasture areas in the county. If the organic soils are drained, then they oxidize, subside, and are subject to soil blowing when the pore spaces fill with air.

Crops grown in most areas of poorly drained and very poorly drained soils are subject to frost damage because of the low position of these soils on the landscape. The number of frost-free days per season is lower in these areas than on adjacent uplands because of cold air drainage to the lowlands.

Soil Erosion from Cropland

The Northern Wisconsin Cropland Study (1999) identified 5 percent of non-federal rural county land as cropland, 3 percent as surface waters, 90 percent as forest, and 2 percent as residential, commercial or industrial land.

In 1999 a transect survey was conducted in Forest County to evaluate soil erosion. The survey calculated the "T", or the allowable soil loss, of the soils. Cropland Transect Survey data indicates that 28% of the fields have a "T" of three, 65% have a "T" of four, and 7% have a "T" of five. The approximate average "T" is 3.8 per acre. The report also indicates that 46% of the cropland are on slopes of 0-2%, 27% are on slopes of 3-4%, 23% are on slopes of 5-7%, 2% are on slopes of 8-10% and 2% are on slopes greater than 10%. The report indicates present crop rotations are also erosion limiting by nature. The majority of the cropland is in forage production, which reduces the likelihood of erosion. The following is the breakdown of rotations: 78% forage production, 7% small grains, 7% idle conservation cover and 8% row crops/specialty crops.

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

PERFORMANCE STANDARDS AND PROHIBITIONS
Chapter 4

The County land and water resource management plans are the local mechanism to implement performance standards and prohibitions. Through Wisconsin Act 27, the Wisconsin Legislature amended state statues to allow county land & water conservation committees to develop implementation strategies for addressing local water quality priorities related to controlling erosion, sedimentation, and nonpoint source water pollution.

The Technical Advisory Committee recommended that the Performance Standards continue to be implemented on a voluntary basis. Ground disturbing activities over 10,000 square feet will be administered by DNR. Lesser amounts of disturbance will be controlled by county administration.

Agricultural Performance Standards

Agricultural land management is usually the focus of Land and Water Resource Management plans, because bare soil erodes fast. Forest County's largest crop is timber. Cleared forestland, usually on slopes steeper than most productive farmland exists on, is the land based focus of this plan as shown in Work Plan Goal 2: "Maintain a healthy and vigorous forest." Most forests are select cut, meaning there are few areas that the ground cover is stripped to the extent that erosion can start. Clear cuts are few but rarely disturb the ground to the point of erosion as the understory is reinvigorated quickly due to the open canopy. Forest County's county forests are dual certified (FSC & SFI) as sustainably managed; therefore the Forestry Department will continue to review silvicultural procedures that occur on county forest lands.

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 is to restore native vegetation to shoreland property in order to reestablish riparian buffer areas. Forest County shoreland zoning also has an element within the ordinance to not mow vegetation within particular shoreland buffer areas. Healthy buffer zones reduce nonpoint source pollution and impede soil erosion but may add to overall phosphorus loading.

Animal waste is generally not a pollution concern due to the relatively low number of livestock operations. However, the county does help monitor farms and offers cost-share funding to individuals to help bring problem farms into compliance.

Priority Farm Strategy

Agricultural land management is usually the focus of Land and Water Resource Management plans. In Forest County, the largest crop is timber followed by forage, with only a small percentage in row crops. Few of these agricultural activities are in the shoreland areas. Forest land in the county is enrolled in the State's Managed Forest Law (MFL). These forests are cut on a rotational basis under the supervision of the State and seldom clear cut. The federally funded EQUIP program encourages clear cutting as a young forest is more beneficial to wildlife. Erosion seldom occurs on these parcels as certified loggers dominate the cutting market and proper practices are the hallmark of certification. Program information is provided through a yearly newspaper published and delivered to each household in conjunction with the area's only free newspaper.

A general approach to providing information to all farms will occur with Work Plan activities. As problems become apparent through GIS analysis and monitoring of specific farms, then individual attention will be given to that farm to bring them into compliance.

Non-Agricultural Performance Standards

A voluntary educational approach will continue to be used to achieve erosion control standards in Forest County. One-on-one contacts with landowners and contractors are the most common method used to promote construction erosion control. All new constructions require Uniform Dwelling Code compliance for stormwater control.

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 Forest County Zoning and Shoreland Protection Ordinance. Forest County also requires new businesses to address erosion control and stormwater management for 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.

2012-2016 Work Plan Accomplishments
Chapter 5

This chapter is a summary of how each of the Work Plan goals was accomplished. Actions for each goal are described. Knowing what has occurred helps to determine which actions to continue with when creating the next 5-year Work Plan.

High Priority 2012-2016 Work Plan Activities

Goal 1: Slow the spread of non-native invasive species.

- Continued support of Tri-county AIS Partnership
- Continued support of WRISC Partnership (multi county, multi state)
- Continued support for County Lake Association membership
- Continued support for all lake association education

Goal 2: Maintain a healthy and vigorous forest.

- Encourage sustainable forestry practices on private and public lands.
- Encouraged Federal guidelines for clear cuts to support healthy wildlife populations
- Reduce illegal garbage dumping on commercial, county, state, and federal forest lands by providing adequate facilities for garbage, recycling and other banned landfill items including toxic waste.

Goal 3: Protect shoreland areas.

- Promote best management practices to restore and maintain riparian habitat by elevating erosion as a nuisance subject.
- Protect shoreland stewardship by creating new shoreland ordinance

Goal 4: Reduce phosphorus loading to surface waters.

- Reduce phosphorus from septic systems by completing the county sanitary database and requiring additional soil tests to confirm good soil conditions and adequate facilities for homes.
- Reduce phosphorus pollution by investigating muck samples from area lakes to confirm internal loading designations and investigate sources
- Control soil erosion by elevating soil movement across property lines as a subject of nuisance citation.

Goal 5: Promote well planned development.

- Implement local and county comprehensive plans by matching zoning maps to town land use maps.

Goal 6: Reduce mining impacts on water resources.

- Maintain working knowledge of mining laws and requiring non-metallic mines to be stormwater compliant
- Discuss status of current mining rules, stay current and support townships that are in favor of mining.

2018-2027 Goals & Objectives
Chapter 6

Goals and objectives, listed in priority order, were created from resource concerns that were identified by the Advisory Committee. These goals and objectives will focus Land Conservation Department activities over the next 10 years.

The Land Conservation Department along with agency partners will implement actions agreed upon annually as staff and funding become available.

The goals are listed below in order of priority as determined by the Forest County Land Conservation/Agriculture and Extension Committee in association with recommendations from the Advisory Committee.

2018-2027
Goals & Objectives:

Goal 1: Remove and Reverse Lake Eutrophication.
(Anticipated Outcome – Swimmable, fishable, and drinkable water.)

Objectives

1. Educate and assist towns, lake districts/associations, landowners, and legislators to understand the merits of vacuum dredging accumulated sediment and aquatic invasive species to remove impairments.
2. Assist in the reduction and removal of legacy sediment from waterbodies by towns, lake districts/associations, and landowners.
3. Support legislation to allow local maintenance of near shore areas to benefit fish populations and aid navigation.

Goal 2: Slow the spread of invasive and non-native nuisance species.
Anticipated outcome: Stabilize the current ecosystem from further advancement of non-native species, terrestrial and aquatic.

Objectives:

1. Assist lake organizations and landowners in mapping the type and quantity of invasive species.
2. Assist in acquiring a vacuum weed harvester or vacuum dredge for individual or cooperating groups of lakes.
3. Keep lake organizations appraised of grant opportunities.
    - Cooperate with grant applications and information.
4. Maintain educational levels for invasive species in the Land and Water Resource office.
5. Participate in/with local and regional groups that monitor and remove invasive species.

Goal 3: Increase the amount and quality of information available concerning land and water in Forest County.
Anticipated outcome: More accurate mapping to facilitate proper ordinance development and land use procedures.

Objectives:

1. Procure LIDAR for Forest County.
    a. Assist lake organizations with information to complete plans and applications.
    b. Assist Towns and landowners with proper infrastructure placement to prevent erosion and flooding.
    c. Provide a platform for FEMA to update Forest County floodplain mapping.
    d. Assist landowners with accurate placement of structures to avoid floodplains and wetlands.
2. Create legal mapping for ordinances with parcel based GIS.
    - Maintain educational requirements for GIS data base in county offices.
3. Assist or partner with the Fox–Wolf Watershed Alliance working toward watershed recovery starting with Pine and Arbutus Lakes.
4. Create county wide lake plan to streamline grant proposals.

Goal 4: Reduce phosphorus and nitrogen loading to surface waters.
Anticipated outcome: Slow eutrophication of surface waters.

Objectives:

1. Create farmland preservation ordinance to protect surface and ground water from concentrated animal housing/feeding operations.
2. Monitor and reduce runoff to surface waters.
    - Educate landowners as to shoreland best management practices.
    - Codify shoreland buffer requirements
3. Monitor and inspect existing sanitary systems.

Goal 5: Promote well planned development.
Anticipated outcome: Protect property values of the remaining privately owned land in Forest County.

Objectives:

1. Revise the County Comprehensive Plan to address dwindling tax base.
2. Create Farmland Preservation Zoning ordinance to protect the livability of existing residential homes.
3. Adopt flood shadow for Bog Brook and Pine Lake as necessary.
4. Update all ordinances and provide information to landowners.
    a. Shoreland
    b. General zoning
    c. Subdivision
    d. Mining
5. Create wetland bank from tax delinquent or available properties.
    a. Create SAMP (special area management plan) for certain wetland types.
    b. Work toward administrative scenarios to make "whole" landowners that find themselves with properties that are considered totally wetland and are lots of record.
6. Scan all permits to GCS to maintain an environmental database.

Goal 6: Maintain a healthy and vigorous forest.
Anticipated outcome: Promote sustainable silvilcultural activities in Federal, State and private forests that protect forest health, sustain healthy wildlife populations, and the economic stabilization of the industry.

Objectives:

1. Establish a single point of contact between Forest County and the USFS (United States Forest Service) to implement and expand the "Good Neighbor Agreement."
2. Continue to implement the 15-year County Forest Land Use Plan.
3. Encourage a variety of economic opportunities related to forests, forestry, and forest-based products.
4. Promote sustainable forestry practices on both private and public lands to maximize residual stand quality and promote abundant regeneration of a range of tree species.
5. Promote healthy and protected forest ecosystems to serve a multitude of ecological roles that include habitat for animal and plant species and water quality protection.

BUDGET ESTIMATE: An annual estimated budget for the 2017-2026 period is outlined here. In estimating the budget, it is presumed that the county will continue to staff the Land Conservation Department at its current level of 1.8 persons. It is further presumed that DATCP and WDNR will meet their financial obligations for staffing of local conservation personnel and projects.

YEAR	COUNTY	DATCP	WDNR	COST SHARE	TOTAL ESTIMATE
2016	59,184	79,081	0	15,000	153,265
2017	25,000	81,833	50,000	14,000	120,833
2018	30,000	82,500	10,000	20,000	142,500
2019	30,000	82,500	10,000	20,000	142,500
2020	35,000	84,500	15,000	25,000	159,500
2021	35,000	84,500	15,000	25,000	159,500
2022	40,000	85,500	15,000	25,000	165,500
2023	40,000	85,500	18,000	25,000	168,500
2024	45,000	86,500	18,000	25,000	174,500
2025	45,000	86,500	20,000	25,000	176,500

REGULATIONS
Chapter 7

Regulation Types

Forest 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 – Wisconsin Pollution Discharge Elimination System Permits
- Department of Natural Resources – Performance Standards - Administrative Code NR 151
- Department of Natural Resources – NR216 Stormwater Discharge Permits and Construction Site Erosion Control
- Department of Natural Resources – Chapter 29.601, Wisconsin Statutes – Noxious Substances
- Wis. Admin. Code chapter SPS 383 – private septic or sanitary systems.

Forest County constantly updates the following local regulations as new information becomes available:

- Forest County Zoning Ordinance
- Forest County Subdivision Ordinance
- Forest County Nuisance Ordinance
- Forest County Non-metallic Ordinance
- Forest County Floodplain Ordinance

Enforcement Process

A landowner that is out of compliance with state performance standards and prohibitions and refuses technical and financial assistance from the Forest County Land and Water Resource Department will be referred to the Department of Natural Resources. A copy of the enforcement letter will be sent to the Department of Agriculture, Trade and Consumer Protection. Landowners who are in violation of any of the above Forest County Ordinances will be handled within the Forest County Land and Water Resource Department, and appropriate cases will be referred to the Forest County Corporation Counsel or cited by county administration. Landowners who are in violation of the soil erosion control standards will be handled within Forest County Land and Water Resource Department, and appropriate cases will be referred to the Department of Natural Resources in Rhinelander.

MONITORING AND EVALUATION
Chapter 8

Introduction
This chapter addresses both water quality monitoring and briefly summarizes the plan for progress and evaluating the effectiveness of the Land and Water Resource Management Plan.

The Forest County LWRM Plan is intended to be a working document that will be reviewed annually by the LWRC and LWRD to track progress in accomplishing the goals and actions of the Work Plan. Monitoring and evaluation of specific resource issues can be accomplished in many different ways. Some of the methods to track the progress of the LWRM plan are:

1. Performance Standards and Prohibitions Monitoring and Evaluation
GIS technology will be used as a tool to track and monitor landowner compliance with the performance standards and prohibitions. We track and monitor landowner compliance with the GCS Tracking System installed last year. It can generate alerts to any activity required by Farmland Preservation Program. Every piece of paper is attached to a piece of property and tracked with this program. In addition, all data regarding landowner compliance with the performance standards and prohibitions will be kept in hard copy format in the landowner file.

2. Water Quality Monitoring
Citizen volunteers are monitoring lakes through the Citizen Lake Monitoring program. There are 22 lakes monitored for clarity. Fifteen lakes are monitored for chemistry (phosphorus and chlorophyll). Eight lakes are monitored for Eurasian water-milfoil. Five lakes are monitored for Curly-leaf pondweed. Other lakes are also monitored for specific invasive species. Forest County supports this monitoring program and will continue to encourage lake associations and lake property owners to voluntarily participate in this program. While Forest County supports these efforts, other types of monitoring such as sediment sampling, shoreland and sanitary evaluations also need to be encouraged and documented to arrive at the best management plan for the whole lake's health.

3. Phosphorus Loading
Nutrient loading can adversely affect water quality by promoting excessive plant growth. Where these nutrients come from can be as obvious as a barnyard system and feedlot installed improperly, or as subtle as a dense mixed forest shedding leaves that are decomposed by earthworms and soil bacteria.

Location	Total P (mg/l)	Diss P (mg/l)
Non fertilized Lawn	1.58	0.33
Fertilized lawn	2.85	0.77
Unfertilized wooded	3.98	1.99

Dr Paul McGinly UW Stevens Point 2002 Water Investigation Report 02-4130

Since Forest County has relatively few barnyards or feedlots, aerial photographs will show where the County should reach out to farmers that do not have internally drained operations. Those farmers will be offered assistance to install wastewater treatment strips. The BARNY spreadsheet will be used to determine compliance with the standard.

Towns that have culverts feeding directly or in proximity to surface waters will be offered assistance where known flooding takes place. LIDAR will be available to towns when planning stormwater retention or distribution. Ditches that have been filled during road reconstruction, or de-icing of roads through sand applications, can be routed to infiltrate water in a way that doesn't affect surface waters.

4. Nutrient Management

In cooperation with DATCP, Forest County personnel will monitor and measure nutrient management progress on known installations. Tracking will be with the Nutrient Management Plan Checklist. Periodic plan review will monitor compliance with soil test results.

A vigorous inspection, maintenance and pumping routine is in place for all shoreland sanitary systems. Maintaining well vegetated areas downgradient of any sanitary system can improve overall nutrient removal.

Forest County will continue to collaborate with the EPA and it's contractor, CADMUS in the development of total maximum daily loads (TMDLs) for total phosphorus (TP) and total suspended solids (TSS) for surface waters located in the Wolf River Basin.

5. Annual Reporting/Spot checks

As required, Forest County will report to DATCP and DNR on progress towards implementation of the performance standards and prohibitions as well as other soil and water resource activities. In addition, DATCP and NRCS currently work with Forest County staff to plan and engineer all funded activities. In the absence of farming or timber cutting activities, other sources of generation will be examined and documented.

Approximately 20 lakes are monitored for water quality. Monitoring for phosphorus may need to increase on lakes that up to this point were not monitored for phosphorus and chlorophyll. Nutrient management will be accomplished by monitoring steps 1 thru 5.

INFORMATION AND EDUCATION STRATEGY
Chapter 9

Information and education strategies are an integral part of this plan and Forest County's conservation programs. Educational opportunities for youth and property owners raise their awareness of land and water resource protection and enhancements.

Many of the objectives in the annual Work Plan will emphasize information and educational strategies like posting information on the Internet, publishing in newspapers, holding workshops, and using existing brochures from various agencies. Information and education activities will be outlined within the annual Work Plan. As plan implementation proceeds and as Work Plan delineated groups meet to determine how best to solve a resource concern, then the Land and Water Resource Department will further define how to create additional information and education strategies.

Educational opportunities are equally necessary for all Land and Water Resource Department staff to interpret accurately the data they collect and distribute. In addition, education for Committee members will reinforce the necessary commitments they must make in their budgets for staff to carry out this LWRM Plan.

COOPERATION & COORDINATION
Chapter 10

Cooperation
The Land and Water Resource Department staff seeks input from and works closely with a diverse group of agencies, associations, and organizations involved in resource management and protection in Forest County. These agencies and groups include: United States Department of Agriculture – Farm Service Agency (FSA), Natural Resource Conservation Service (NRCS), and United States Forest Service (USFS); Wisconsin Department of Agriculture, Trade, & Consumer Protection (DATCP); Wisconsin Department of Natural Resources (DNR) staff such as Water Resources Management Specialists, Fisheries Biologists, Water Regulations and Zoning Specialists, Water Program Management staff, Watershed Management Staff, & Forestry staff; Army Corp of Engineers, University of Wisconsin – Extension; Forest County Forestry, Zoning, Highway, & Sheriff departments; Forest Industry Safety and Training Alliance, Inc. (FISTA); Forest County Lakes Associations; Forest County ATV Clubs; & Forest County Land & Water Conservation Department.

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 Forest County's land and water resources. Plans from other agencies that relate to this plan were reviewed and documented in Chapter 3 Resource Assessment – Previous Reports Summarized.

Coordination
In 2011, the Wisconsin Legislature showed that it understood coordination as a legal process, and intended that the process be applied to give local governments an important and meaningful seat at the negotiating table, on a level playing field. When the legislature enacted Act 21 in 2011, it amended Wisconsin Statute 227.137 (3) to require that all state agencies proposing rules prepare an economic impact analysis "in coordination with local government units that may be affected by the proposed rule."

Forest County has formally notified all State and Federal agencies of our intent to "coordinate" and wish to be informed of all planning and resource management proposals. We wish to remain informed with our view sought and considered throughout all planning processes.

Federal definition and use of coordination;

43 U.S.C. 1712 Land Use Plans

III Sec.1610.3 Coordination with other federal agencies, State and local governments, and Indian tribes.

1. Sec.1610.3-1 Coordination of planning efforts.

State Statutes

1.11 Governmental consideration of environmental impact

1.13(2)(g) Encouragement of coordination and cooperation among nerby units of government.

16.023(1)(c) study areas of cooperation and coordination in the state's land use statutes and recommend to the governor legislation to harmonize these statutes to further the state's land use goals.

16.967(8) Advice; cooperation. In carrying out its duties under this section, the deparment may seek advice and assistance from the board of regents of the University of Wisconsin System and other agencies, local governmental units, and other experts involved in collecting and managing land information. Agencies shall cooperate with the department in the coordination of land information collection.

560.04(2)(b) Cooperate with and provide technical assistance to county, town, village, city and regional planning commissions and their governing bodies, community development groups, and similar agencies created for the purposes of aiding and encouraging orderly, productive and coordinated economic and community development in the state and assuring a productive and coordinated state-local relationship.

GLOSSARY
Chapter 11

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 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) EPA requires that the DNR update its list every 2 years.

Aquatic Invasive Species Coordinator (AIS Coordinator) – An educational outreach position to combat aquatic invasive species.

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.

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 State 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 – 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 LWRC.

County Conservationist – County Land Conservation Department head, responsible for implementing programs assigned to the LWRD and for supervising LWRD 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.

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

Department of Safety and Public Service (DSPS) – The state agency responsible for establishing statewide standards for erosion control at building sites for the construction of public and private buildings and places of employment.

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 LWRC 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 LWRC, LWRD and individual land users in managing land, water, fish and wildlife. The DNR administers state cost-sharing funds for priority watershed project, 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 tax relief to participating landowners.

Forest County Association of Lakes (FCAL) – The purpose of the FCAL, Inc. is to facilitate education, research, and sharing to protect Forest County inland water bodies. This term is used in the Work Plan.

Forest Industry Safety and Training Alliance Inc. (FISTA) – This group creates training opportunities for loggers. This term is 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.

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

Land and Water Conservation Board (LWCB) – Composed of 3 local elected officials, 4 appointed by the Governor (1 shall be a resident of a city with a population of 50,000 or more, 1 shall represent a governmental unit involved in river management, 1 shall be a farmer and 1 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, 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 Resource Committee (LWRC) – The unit of Forest 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 Resource Department (LWCD) – The department of Forest County government responsible for administering the conservation programs and policies of the LWRC.

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) EPA requires that the DNR update its list every 2 years.

May – The term "may" in the guidelines represents suggested components in a LWRM 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 s. 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.

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.

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 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 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.

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, and Forest Service and others are agencies of the USDA.

United States Forest Service Resource Advisory Committee (USFS-RAC) – The Chequamegon-Nicolet National Forest (CNNF) Resource Advisory Committee consists of residents of multiple area counties that work with the federal government to implement projects within the forest plan. Towns, Counties and non-profit organizations may apply to the RAC to pay for projects on land outside of the national forest that benefit the national forest. Projects are paid with Title II & III funds that exist under the reauthorized Secure Rural Schools and Community Self-Determination Act (Public Law 110-343), which are made available to the RACs by counties receiving federal funds based on the percentage of land in federal ownership, timber receipt payments and per capita income.

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

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.

Wild Rivers Invasive Species Coalition (WRISC) – Multi state, multi county work group that coordinates education and removal of invasive species both terrestrial and aquatic.

ATTACHMENT A

Forest County's
Outstanding and Exceptional Resource Waters

FOREST COUNTY

Waterbody Name	Portion Within ORW/ERW Classification	Status
Brule Creek	All	ORW
Brule River	Florence Co line up to Brule Lake	ORW
Butternut Lake	All	ORW
Elvoy Creek	All	ORW
Franklin Lake	All	ORW
Jones Creek	All	ORW
Little Rice Lake	All	ORW
Lucerne Lake (Stone)	All	ORW
Metonga Lake	All	ORW
Otter Creek (North Otter Creek)	All	ORW
Peshtigo River	All	ORW
Pine River	All	ORW
Popple River	All	ORW
S Branch Pine River	All	ORW
S Branch Popple River	All	ORW
Unnamed headwater branch to Popple River	All	ORW
Wolf River	From the outlet of Pine Lake to the Oneida county line	ORW
Armstrong Creek	All	ERW
Bills Creek	All	ERW
Camp 20 Creek	All	ERW
Camp 8 Creek	All	ERW
Gliske Creek	All	ERW
Gruman Creek	All	ERW
Huff Creek	County line upstream to USFS Rd 2454	ERW
Indian Creek (S24 T34N R15E)	All	ERW
Johnson Creek	All	ERW
Knowles Creek	All	ERW
Lilypad Creek	USFS Rd 2169 to Lilypad Lake	ERW
Little Popple River	USFS Rd 2166 to Popple River	ERW
McDonald Creek	S Br Pine River to USFS Rd 2177	ERW
Middle Branch Peshtigo River	All	ERW
N Branch Oconto River	All	ERW
N Branch Peshtigo River	All	ERW
N Branch Popple River	All	ERW
Ninemile Creek	Headwaters to upper Ninemile Lake	ERW
Rock Creek	All	ERW
Rocky Siding Creek	All	ERW
Spencer Creek	All	ERW
Stoney Creek	All	ERW
W Branch Armstrong Creek	All	ERW
Wilson Creek	All	ERW

ATTACHMENT B

Open-status Contaminated Soil Sites in Forest County

Contaminated Sites in Forest County	
Name	Type - Status
AT&T Communications Fire Tower Ln & STH 71, Crandon	Open LUST
Spencers Bar Cypress & Broadway, Newald	Open LUST
Georges Self Service Station 500 S Lake St, Crandon	Open LUST
Hoffman Site STH 55 & CTH M, Mole Lake	Open LUST
Carols Red Arrow Bar 7595 Old 8 Rd, Cavour	Open LUST
Contamination Detected 100 E Pioneer St, Crandon	Open ERP
Connor Forest Ind/Nicolet (Mill Site) 400 N Mill St, Laona	Open ERP

Source: WDNR BRRTS.

ATTACHMENT C

Public Hearing Notice

Public Hearing Notice

Forest County Land Conservation Committee
Wednesday, September 6th, 2017
5:00 p.m. Room 107 County Board Room

By order of the Chairman, Paul Millan

PUBLIC NOTICE is given to all persons in the County of Forest that a public hearing will be held on September 6th, 2017 at 5:00 p.m. in room 107 of the Forest County courthouse to solicit comments on the proposed Land and Water Plan. This plan reflects the goals and objectives of the Land Conservation Committee and staff for a five year period.
A copy of the proposed plan will be on file and open for public inspection in the office of the County Clerk, or on the website of North Central Wisconsin Regional Planning Commission at http://www.ncwrpc.org/forest/lwrm/ where a copy can be obtained, or be transmitted electronically by e-mail to an interested party.

All persons interested are invited to attend this hearing and be heard. Written comments may be submitted to:
Forest County Land Conservation Committee
200 East Madison Street
Crandon, WI. 54520

Notice was faxed to the media Forest Republican & Pioneer Express on Wednesday august 9th, 2017. Agenda was posted to the public at the east/west entrances of the Forest County Courthouse and to the Web at www.co.forest.wi.gov on the same day.

Posted by:_____
Forest County Land and Water Resource Administrator

Every effort will be made to reasonably accommodate persons with special needs. Please contact this office at 715-478-1387 to address your concerns.

ATTACHMENT D

Conservation Practices and Cost-Share Rates

Forest County
Conservation Practices and Cost-Share Rates

Forest County promotes the following practices and maximum cost share rates:

Wisconsin Department of Agriculture Funding: ATCP 50 SWRMP

Practices – ATCP 50.61 through ATCP 50.98

Maximum Cost Share Rates - ATCP 50.42

Wisconsin Department of Natural Resources Lake Protection Grant

Practices – Riparian Buffer, Biological Shoreline Erosion Control Practices, Rain Gardens and necessary storm water conveyance systems.

Maximum Cost Share Rate – 75%

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ATTACHMENT E

Watershed Strategies for Improving Impaired Water Quality

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This attachment is a placeholder to provide convenient space for plan revision when Forest County has determined all nine key elements to solving specific water pollution issues on a watershed basis.

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ATTACHMENT F

Appendix G in the 2007 Lake Metonga Adult Fish Survey Preliminary

Report written by:
Michael Preul, Sokaogon Chippewa Community Fisheries Biologist

G

APPENDIX G

2007 Lake Metonga Adult Fish Survey Preliminary Report written by Michael Preul, Sokaogon Chippewa Community Fisheries Biologist

Sokaogon Chippewa Community

2007 Lake Metonga Adult Fish Survey

Preliminary Report

December 20, 2007

Lake Metonga is a 1,991-acre, moderately deep (82 ft), mesotrophic drainage lake located near Crandon, WI. Outlet Creek, the outlet of Lake Metonga, flows into Swamp Creek which eventually passes through the Sokaogon Chippewa Community Indian Reservation. Lake Metonga is clear, highly transparent, moderately-hard, and alkaline. Bottom substrate consists of sand (45%), gravel (45%), rock (5%), and muck (10%). Because of its high water clarity, aquatic plants grow in water depths up to 15 ft.

The fish community is dominated by walleye, smallmouth bass, northern pike, rock bass and yellow perch. The walleye population is self-sustaining but requires supplemental stocking to maintain population levels. Lake Metonga receives high recreational and fishing use with many fishing tournaments held each year. In addition, the Sokaogon Chippewa Community (SCC) exercises treaty rights by harvesting adult walleye from Lake Metonga in the spring. Because of intense tribal and angling harvest, the walleye population has been well studied by fish and game agencies. Walleye surveys to estimate adult population abundance have been performed every 3 – 5 years since 1989; juvenile walleye surveys have been conducted annually (except 1995) since 1985. Other species have been studied but not as intensively.

The Sokaogon Chippewa Community conducted a fisheries survey of Lake Metonga, Forest County, from April 19th through June 13, 2007. The goal of this survey was to obtain detailed information on all gamefish species present, specifically walleye, northern pike, and largemouth and smallmouth bass. Information was collected on other species captured during our sampling efforts, but this information should not be viewed as comprehensive.

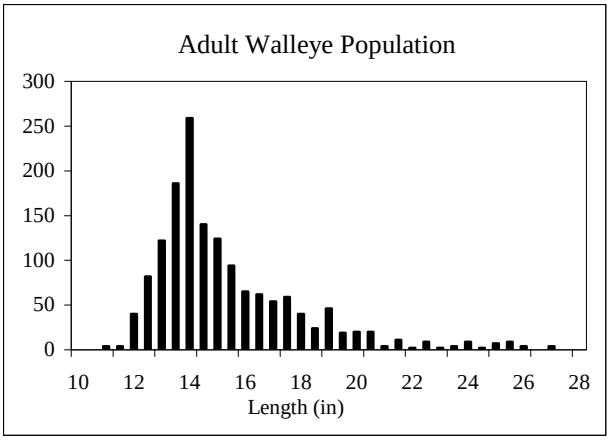
This report provides a brief summary of the adult population survey; however, there will be a more-detailed report available later this winter. This report will include additional results from the adult population survey such as age and growth data, fish condition, etc., but also results from other surveys including the summer panfish survey, the late-summer young-of-year fish survey, the fall baseline fish surveys, and possibly the 2007 Lake Metonga angler creel survey performed by the Wisconsin Department of Natural Resources.

Walleye

The SCC conducted a mark-recapture survey of the Lake Metonga adult walleye population, April 19 to April 27. Adult walleye were defined as all sexable walleye regardless of length and only those of unknown sex > 15 inches long. During six days of fyke netting and three nights of boat electrofishing, 511 adult walleye were captured and marked (fin clipped). On April 27, the lake was resampled using boat electrofishing gear, and 45 adult walleye were captured, of which 13 were clipped from marking efforts.

Based on those results, it is estimated that Lake Metonga contained about 1,532 adult walleye (0.8/acre). This number is slightly higher than the population estimate conducted in 2004 (0.6/acre), but still indicates a population level well-below management goals of 2/acre. Approximately 45% (695) of adult walleye were 15 inches long or longer. The largest walleye captured was a 27.3 inch long female.

Angler and tribal harvest, lack of natural reproduction, and effects of invasive species are all possible reasons for the continued low population levels. Walleye captured during the survey appeared very healthy visually and by taking weights, indicating the Lake Metonga fish community could possibly support more walleye. On November 2, the SCC and the Lake Metonga Association partnered in the stocking of 5000, 6-9 inch fingerling walleye.

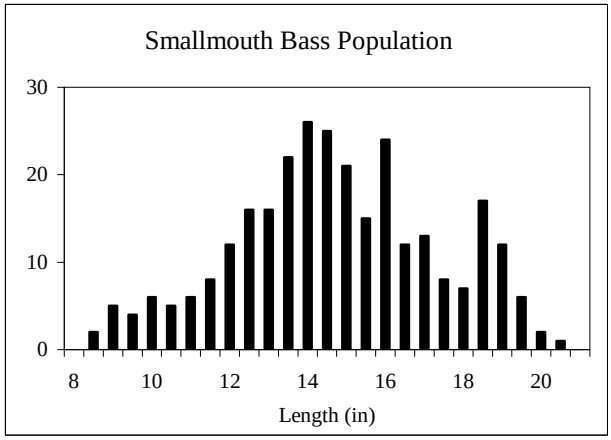


Smallmouth Bass

A mark-recapture survey of the Lake Metonga smallmouth bass population was conducted from April 19 to June 13. During six days of fyke netting and five nights of boat electrofishing, 151 smallmouth bass were captured and marked (fin clipped). On June 13, the lake was resampled using boat electrofishing gear, and 170 smallmouth bass were capture, of which 15 were clipped from marking efforts.

Based on those results, it is estimated that Lake Metonga contained about 1,311 smallmouth bass eight inches or longer (0.7/acre). Of these, 709 (54%) were 14 inches long or larger and 164 (12.5%) were over 18 inches. The largest smallmouth bass we captured was 20.6 inches long.

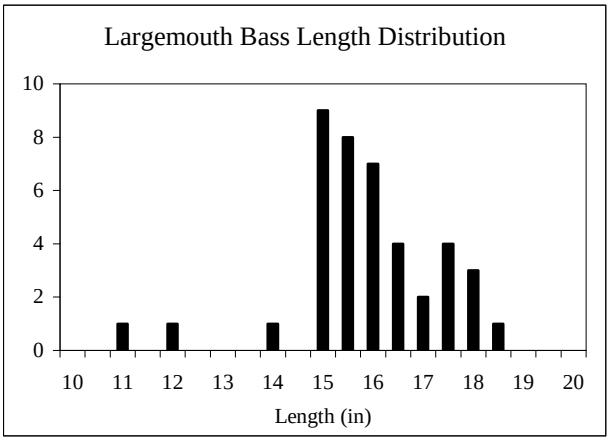
The smallmouth bass fishery appears to be healthy and has remained at about the same density as the last survey in 2004 (0.8/acre). The population consists of many year classes with a nice overall size structure. However, there are some changes to the size structure from 2004 worth noting. In 2004 there were only 15 fish estimated greater than 18 inches, whereas in 2007 there were 164. These differences are less likely due to recruitment to this size but more likely from differences in sampling gear efficiency from survey to survey. In general, smallmouth bass are difficult to sample in Lake Metonga with fyke nets or boat electrofishing due to the depth of smallmouth bass staging and spawning habitat.



Largemouth Bass

A total of 41 largemouth bass were captured during all sampling efforts in the spring,

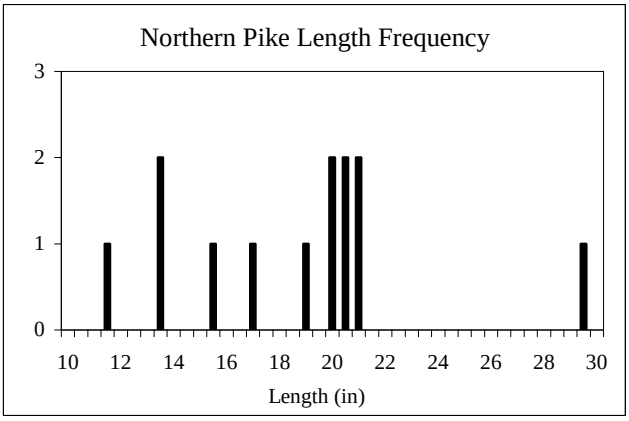
resulting in not enough fish to perform a mark-recapture survey. Of these, 39 fish (95%) were 14 inches long or larger and 4 (10%) were over 18 inches in length. The largest largemouth bass we captured was 18.6 inches long. These numbers are similar to those found in the 2004 survey.
The largemouth bass population has remained at low levels most likely due to the lack of preferred habitat and competition from other species.



Northern Pike

A total of 13 adult northern pike were captured during all sampling efforts in the spring, resulting in not enough fish to perform a mark-recapture survey. Nearly 92% (12) of these fish were less than 26 inches long. The largest northern pike captures was 29.9 inch female.

The northern pike population has declined greatly in abundance since the 2004 survey (137 fish captured). Angler harvest, loss of habitat, competition from other fish species, and effects of invasive species are all possible reasons for the decline.



Other Fish Species

During sampling efforts, six additional species of fish were captured. Low numbers of the following species were present: yellow perch, bluegill, rock bass, white sucker, black bullhead, and black crappie.

Report prepared by:

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