

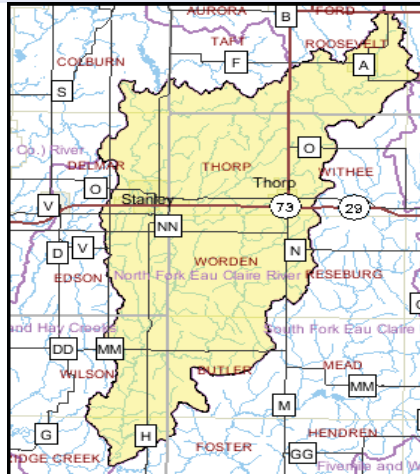
2010 Water Quality Management Plan Update

Lower Chippewa River Basin, Wisconsin

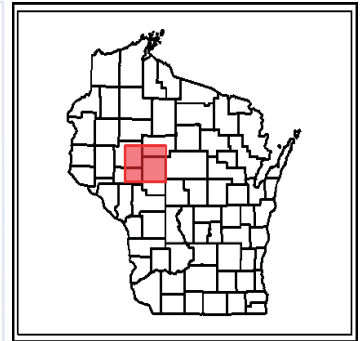
August, 2010

The North Fork of the Eau Claire River watershed lies within four Wisconsin counties: south eastern Chippewa, southwestern Taylor, northwest Clark, and northeast Eau Claire (Map 1). This watershed is one of twenty-four watersheds within the Lower Chippewa River Basin.

The watershed is located in three ecological landscapes: the Forest Transition, the North Central Forest and the Central Sand Plains. The watershed encompasses approximately 206 square miles (132,000 acres) composed of primarily agricultural and forest landscapes.



Map 1: North Fork Eau Claire Water



Contents

- Watershed Details 1**
 - Population and Land Use 1
 - Hydrology 1
 - Ecological Landscapes. 2
 - Historical Note 3
- Watershed Condition 3**
 - Priority Issues 3
 - Water Quality Goals 3
 - Overall Condition 4
 - Point and Nonpoint Sources 4
 - Rivers and Streams 4
 - Lake Health 4
 - Wetland Health 4
 - Groundwater 5
 - Waters of Note 5
- Watershed Actions 6**
 - Grants and Projects 6
 - Monitoring Projects 6
 - Recommendations 7
- Appendices 8**
 - Watershed Map 8
 - Dams and Outfalls. 9
 - Potentially Restorable Wetlands . . . 10
 - Land Use 11
 - Outstanding and Exceptional Waters. 12

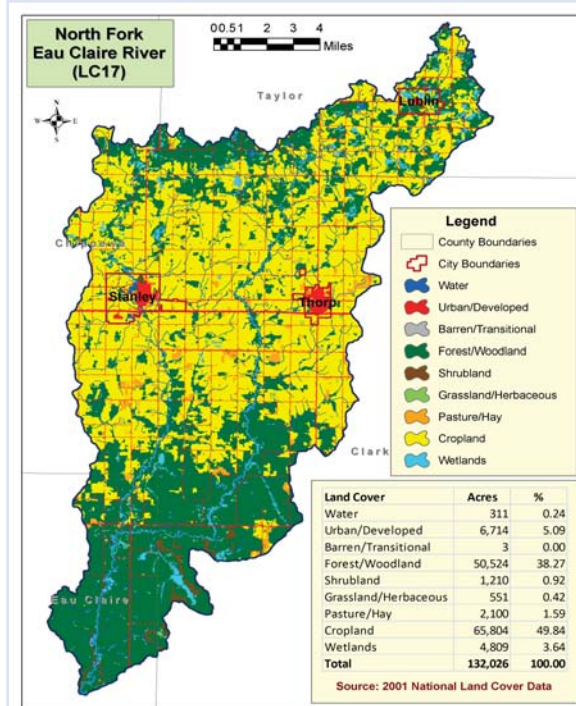
Watershed Details

Population and Land Use

Map 2 displays watershed land use and cover. Agriculture (50%), forests (38%), developed land (5%), and wetlands (4%) compose the majority of the land within the watershed. Additionally, there are 412 stream miles in the watershed and approximately 302 lake acres.

Hydrology

The North Fork of the Eau Claire River watershed's low flows, in conjunction with some effects of polluted runoff, may be limiting the potential biological uses of the streams in this watershed. A number of large warmwater streams are fed by small first and second order groundwater fed tributaries.



Map 2: Land Use -North Fork Eau Claire

Ecological Landscapes

The North Fork Eau Claire River Watershed is located in three ecological landscapes: the Forest Transition, the North Central Forest and the Central Sand Plains (Map 3).

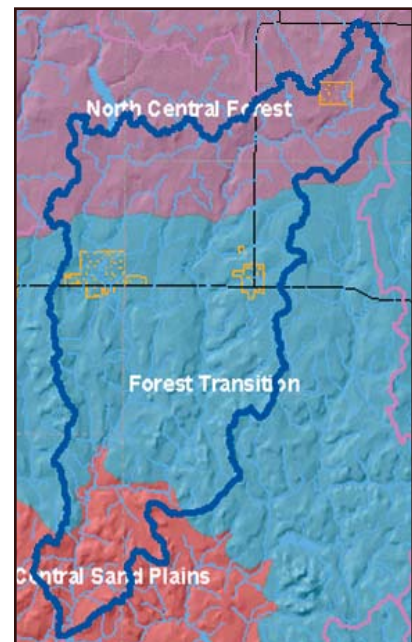
The Forest Transition Ecological Landscape lies along the northern border of Wisconsin's Tension Zone and supports both northern forests and agricultural areas. The central portion lies primarily on a glacial till plain deposited by glaciation between 25,000 and 790,000 years ago. The eastern and western portions are on moraines of the Wisconsin glaciation. The growing season in this part of the state is long enough that agriculture is viable, although climatic conditions are not as favorable as in southern Wisconsin. Soils are diverse, ranging from sandy loam to loam or shallow silt loam, and from poorly drained to well drained.



North Fk Eau Claire at Center Road. Photo Credit: M. Hazuga

The historic vegetation of the Forest Transition was primarily northern hardwood forest. These northern hardwoods were dominated by sugar maple and hemlock, and contained some yellow birch, red pine and white pine. Currently, over 60% of this Ecological Landscape is non-forested. Forested areas consist primarily of northern hardwoods and aspen, with smaller amounts of oak and lowland hardwoods. The eastern portion of the Ecological Landscape differs from the rest of the area in that it remains primarily forested, and includes some ecologically significant areas. Throughout the Ecological Landscape, small areas of conifer swamp are found near the headwaters of streams, and associated with lakes in kettle depressions on moraines. Ground flora show characteristics of both northern and southern Wisconsin, as this Ecological Landscape lies along the Tension Zone.

The North Central Forest Ecological Landscape occupies much of the northern third of Wisconsin. Its landforms are characterized by end and ground moraines with some pitted outwash and bedrock controlled areas. Kettle depressions and steep ridges are found in the northern portion. Two prominent areas in this Ecological Landscape are the Penokee-Gogebic Iron Range in the north extending into Michigan, and Timm's Hill, the highest point in Wisconsin (1,951 feet) in the south. Soils consist of sandy loam, sand, and silts. The vegetation is mainly forest, with many wetlands and some agriculture, though the growing season is not as favorable as it is in southern Wisconsin. Lake Superior greatly influences the northern portion of the Ecological Landscape especially during the winter season, producing greater snowfall than in most areas in Wisconsin.



Map 3 Ecological Landscapes of the N. Fk. Eau Claire River Watershed

The historic vegetation was primarily hemlock-hardwood forest dominated by hemlock, sugar maple, and yellow birch. There were some smaller areas of white and red pine forest scattered throughout the Ecological Landscape, and individual white pines trees were a component of the hemlock-hardwood forest. Harvesting hemlock to support the tanneries was common at the turn of the century, and the species soon became a minor component of forests due to over-harvesting and lack of regeneration. Currently, forests cover approximately 80% of this Ecological Landscape. The northern hardwood forest is dominant, made up of sugar maple, basswood, and red maple, and also including some scattered hemlock and white pine pockets within stands. The aspen-birch forest type group is also relatively abundant, followed by spruce-fir. A variety of wetland community types also are present, both forested and non-forested.

The Central Sand Plains Ecological Landscape, located in central Wisconsin, occurs on a flat, sandy lake plain, and supports agriculture, forestry, recreation, and wildlife management. The Ecological Landscape formed in and around what was once Glacial Lake Wisconsin, which contained glacial meltwater extending over 1.1 million acres at its highest stage. Soils are primarily sandy lake deposits, some with silt-loam loess caps. Sandstone buttes carved by rapid drainage of the

glacial lake, or by wave action when they existed as islands in the lake, are distinctive features of this landscape.

The historic vegetation of the area included extensive wetlands of many types, including open bogs, shrub swamps, and sedge meadows. Prairies, oak forests, savannas and barrens also occurred in the Ecological Landscape. An area of more mesic forest with white pine and hemlock was found in the northwest portion, including a significant pinery in eastern Jackson County. Today, nearly half of the Ecological Landscape is non forested, in agriculture and grassland. Most of the historic wetlands were drained in the early 1900s and are now used for vegetable cropping. The forested portion is mostly oak-dominated forest, followed by aspen and pines. A minor portion is maple-basswood forest and lowland hardwoods.

Historical Note

The City of Thorp. In 1870, the area that is now the City of Thorp, located along McGrogan Creek in Clark County in the North Fork Eau Claire River watershed, was a land of timber. The abundant pines and hardwoods were the base of the area's first industries, in shingles, barrel staves, and charcoal. The earth furnished red clay for bricks used to construct businesses and homes, many of which are still in use.

When James and Ephrime Boardman built the first cabins, there were no roads. The homestead was ten miles from a neighbor, with camps of Chippewa Indians in what are now the townships of Reseburg, Worden and Butler.

New settlers arrived and first trails, and then roads, were carved out of the wilderness. Farms sprang up on the fertile land, then schools, saloons, general stores, and churches, were established. Within ten years, there was the beginning of a thriving community. The Village of Thorp was established on May 29, 1893 with a population of 883. In April 1948 the Village of Thorp became the City of Thorp with a population of 1,052.



Yellowstone Trail

In the early 1900's, dairying was so well established that farmers brought cheese makers to the area to begin processing the now famous cheeses. These cheeses, and traditional sausages can still be purchased as one travels through the area.

The original Boardman and Indian trails became part of the famous Yellowstone Trail. In the 1920's, this road, which ran from Plymouth Rock in Massachusetts, to Puget Sound in Washington, was the nation's first interstate highway to be completed. The intersection of State Highway 73 and County Road X in Thorp, are now marked with the yellow stones and signs, which marked the original road. A new movement is in progress to not only retrace the trail in Clark County, but throughout the State of Wisconsin.

Watershed Condition

Priority Issues

Issues of concern in the basin include: loss and fragmentation of native habitats due to population growth and development; sediment and nutrient (nitrogen and phosphorus) delivery to water bodies from both point and non-point sources; and threats to the high quality and abundant groundwater sources.

Water Quality Goals

Reduction of phosphorus loading from this watershed will be needed to reduce excessive algae growth in lakes Eau Claire and Altoona, downstream impoundments on the Eau Claire River. Specifically, land use modeling of the watershed for these lakes has identified the agricultural lands in the upper portion of this watershed as important locations for utilization of best management practices for phosphorus control. Modeling work has identified the most effective practices to implement in the upstream watersheds to achieve phosphorus and sediment reductions.

Overall Condition

The watershed has one impaired water, but overall fairly diverse warmwater fisheries are supported including multiple coldwater streams supported by groundwater fed streams and relatively intact habitat for salmonid species.

Point and Nonpoint Sources

Point and nonpoint source issues are key issues for this watershed. Reduction of phosphorus loading from all sources is critical for reducing excessive algae growth and eutrophication of impoundments on the Eau Claire River. Specifically, land use modeling of the watershed for these lakes has identified the agricultural lands in the upper portion of this watershed as important locations for utilization of best management practices for phosphorus control.

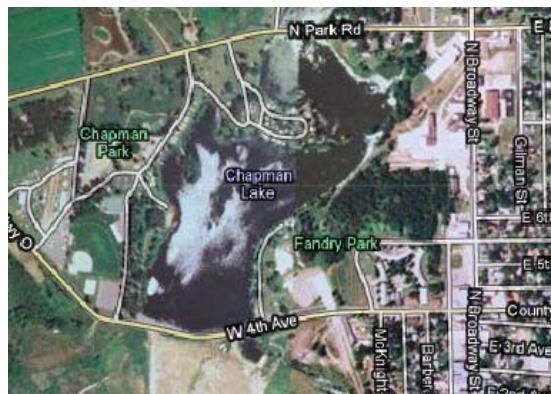
Rivers and Streams

The North Fork of the Eau Claire River is a 56-mile warm water sport fishery. Recent surveys in Clark and Eau Claire Counties found a very diverse fishery, smallmouth bass was the dominant game fish. Multiple year classes of smallmouth bass were found throughout the river, however lower densities are typically found in central Clark County. The river in this reach lacks deep water habitat for smallmouth bass, especially during low flow periods. In addition, there is a greater accumulation of fine sediments in this section. Water chemistry sampling on the North Fork Eau Claire indicates total phosphorus concentrations are highest in central Clark County, nearly 3 times higher than the proposed water quality standard. Nonpoint source runoff is the primary contributor of sediment and nutrients to the river.

McGrogan Creek is a six-mile warm water stream that is currently classified as a limited forage fishery in NR 104. Surveys completed in 2000 indicate the stream supports a diverse warm water forage fishery and the appropriate classification is full fish and aquatic life.

Lake Health

Chapman Lake (Map 4), an impoundment on the Wolf River in Stanley, had its dam renovated in 2009-2010 and is being dredged. In the summer of 2006 it experienced a significant fish kill attributed to low oxygen. Flow into the lake ceases during dry conditions. The lack of inflow, and naturally low oxygen levels of water entering the lake during dry periods, limits the lakes potential to maintain water quality and support fish. Like the river above the lake, the lake's potential to maintain water quality and support fish is limited by natural conditions.



Map 4 Chapman Lake

Wetland Health

Historically, an estimated 17% of the North Fork of the Eau Claire River watershed consisted of wetlands, based on hydric soils information. Based on Wisconsin's Wetland Inventory information, 7% of the watershed remains as wetlands today. Lands that have hydric soils, but are not identified as wetland are considered "lost" wetlands, and make up 10% of the watershed (Figure 1).

Wetland Condition

Little is known about the condition of the remaining wetlands but estimates of reed canary grass infestations, an opportunistic aquatic invasive wetland plant, into different wetland types has been estimated based on satellite imagery. This information shows that reed canary grass dominates 65% of the existing emergent wetlands and 13% of the remaining forested wetlands. Reed canary grass domination inhibits successful establishment of native wetland species.

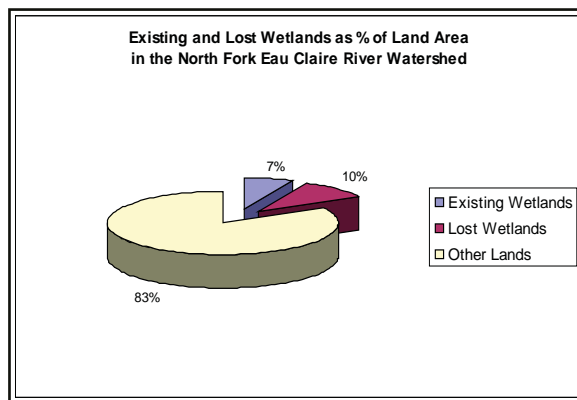


Figure 1 Wetlands- Existing and Lost

Wetland Restorability

There are an estimated 13,000 acres of lost wetlands in the watershed, where hydric soils are present, but wetland function is gone, due to drainage, filling or other activities. Land uses on these lost wetlands are predominantly cropland (41%) and deciduous forests (45%). A small portion has been converted to urban or other uses (14%) (Figure 3). Those areas in cropland uses may be considered compatible with wetland restoration. Actual restorability will depend on many site specific conditions, including landowner interest, reversibility of hydrologic changes and impacts on adjacent lands.

In the Clark County portion of the watershed, a substantial amount of the County Forest is forested land on hydric soils, and it is unlikely that these or similar lands would be converted back to wetland. Most other land uses such as urban development are not considered potentially restorable.

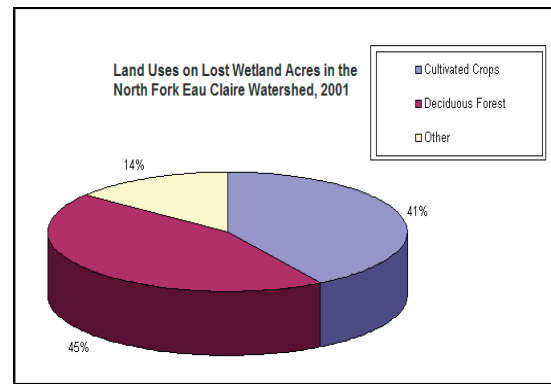


Figure 2. Land Uses of Lost Wetland Acres

Groundwater

No new information is reported for groundwater in this watershed.

Waters of Note

ORW/ERW Waters

Swim Creek is the only Exceptional Resource Water located in the North Fork Eau Claire River Watershed (Map 5).

Trout Waters

Five different streams and stream segments are considered trout waters under NR102 and the state's Fisheries Classification NR1.0 rule. Table 1 lists these streams.

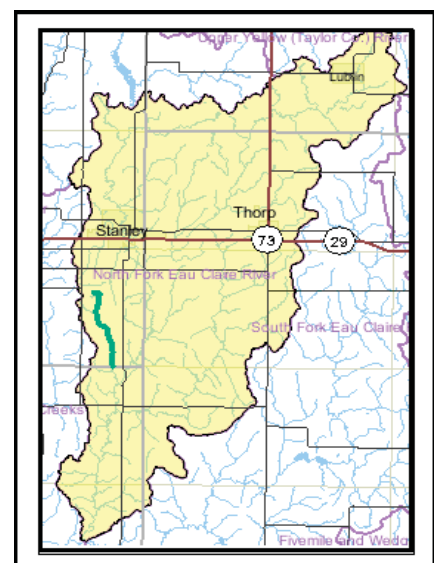
Table 1: Trout Waters of the North Fork Eau Claire Watershed

Official Waterbody Name	WBIC	Start Mile	End Mile	Trout Class	Counties
Sterling Creek	2148500	0	6.61	CLASS III	Clark
Shambaugh Creek	2145600	0	2.26	CLASS II	Eau Claire
Swim Creek	2146100	0	1.37	CLASS II	Eau Claire
Swim Creek	2146100	1.37	6.33	CLASS I	Chippewa
Loper Creek	2145900	0	3.31	CLASS II	Eau Claire
Beeman Creek	2145500	0	3.34	CLASS II	Eau Claire

Impaired Waters

The Wolf River is a 24-mile long warm water tributary to the North Fork of the Eau Claire River that originates in southwestern Taylor County and flows south into Chapman Lake, a millpond in the City of Stanley. The Wolf River flows south out of Chapman Lake and joins the North Fork Eau Claire River in northeastern Eau Claire County. The Wolf River is a clear, medium hard water stream that meanders through portions of Clark, Taylor, Chippewa, and Eau Claire Counties. At least 70 percent of the land adjacent to the stream has been cleared in addition to 94 percent of the land included in the watershed area. There is no public land adjoining the stream; however, public access is possible from six road crossings.

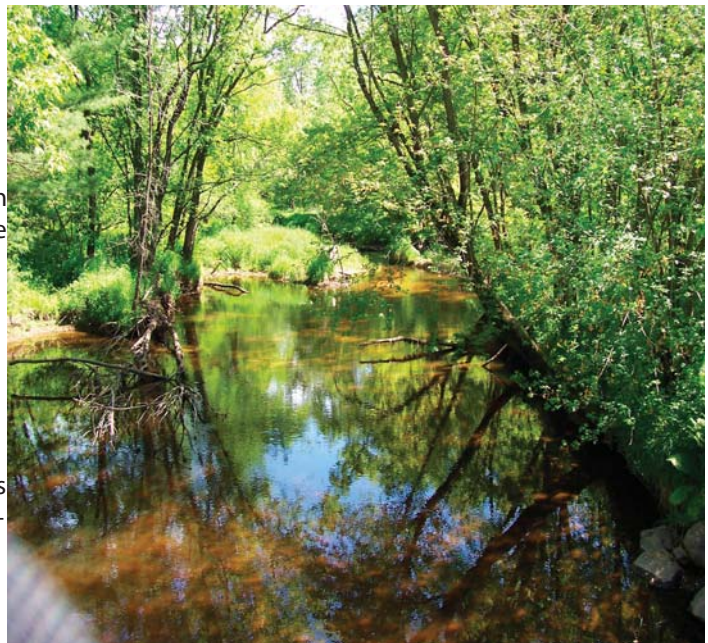
The headwaters, upstream from Chapman Lake, are intermittent and fully support a warm water forage fishery. The stream is classified as a warm water sport fishery from the Chapman Lake dam downstream to the confluence with the North Fork Eau Claire River. A diverse forage fishery, along with some smallmouth bass and northern pike, has been documented in the stream below Chapman Lake. The stream is relatively small and therefore has limited habitat for gamefish, especially adults. Continuous dissolved oxygen monitoring completed upstream of Chapman Lake found concentrations below the water quality standard. The headwaters of the Wolf River are intermittent and



Map 5: Swan Creek, an Exceptional Water

flow through large wetland complexes. Low oxygen levels documented in the headwaters are a result of these natural environmental conditions. This section of river is not listed on the 303d list because these contributing factors are natural and uncontrollable.

The Wolf River, from the Chapman Lake dam downstream to Worden Road, is not supporting its designated use due to dissolved oxygen standards violations. Therefore, this section of river is identified as impaired on the Federal 303 d list. The river was originally listed as impaired due to low dissolved oxygen levels found during the 1980s. Targeted monitoring was completed in 2006 to document dissolved oxygen levels and determine the current biological health of the stream. Data collection included fish surveys, macroinvertebrate sampling and continuous dissolved oxygen monitoring. Continuous dissolved oxygen monitoring completed for the entire month of June resulted in levels below 5 mg/L 22% of the time at CTH MM and 0% of the time downstream at River Road.



Wolf River at River Road Photo Credit M. Hazuga 2010

Dissolved oxygen levels fluctuated substantially at CTH MM as a result of photosynthesis and respiration of filamentous algae. The growth of filamentous algae is a result of excessive nutrients, slow streamflow and the open canopy in this reach of stream. Downstream from Worden Road, the stream corridor is mostly shaded and filamentous algae growth is minimal or absent. As a result, oxygen levels remain above the water quality standard. Additional biological results confirmed that the river below River Road is not impaired and should not be on the 303d list.

Watershed Actions

Grants and Projects

The following grant projects have been received in the last five years and/or are ongoing in the watershed.

Lakes Grant Small Scale Lake Planning Wolf River 04/01/2007 - Complete

The City of Stanley studied Chapman Lake in Chippewa Co to develop a plan for lake enhancement. Major project elements to include: 1) Watershed mapping, 2) Analysis for sediment and nutrient inflows, 3) Meetings with DNR staff, 4) Public meetings to establish community vision, 5) Plan development and final report.

Monitoring Projects

Fisheries projects conducted in the watershed include a wide variety of "baseline" monitoring and targeted fieldwork to gain specific knowledge related to Wisconsin's fish communities. Monitored waters include: Beeman Creek, Goggle-Eye Creek, Little Otter Creek, Loper Creek, McGrogan Creek, North Fork Eau Claire River, Robinson Creek, Roger Creek, Sterling Creek, Swim Creek and Wolf River.

Natural Community Stream Reference Project

This study involves reference site selection and monitoring using the Streams Natural Communities dataset, which is based on stream flow and temperature modeled by WDNR Integrated Science Services and USGS Region V States. This study evaluates highest quality streams representative of each of the eleven proposed natural communities. The purpose of the study is to provide the range of biological and ecological conditions for specific communities through determining the "potential biological use" of each and to gather information that will provide insight into the value of the 11 distinct natural communities for state assessment and water quality standards work.

Aquatic Invasive Species (AIS)

With UW Extension and Wisconsin Sea Grant, WDNR works with water users to prevent transporting aquatic invasive species. Additional work includes monitoring and control.

Recommendations

Streams:

- The listing of McGrogan Creek in State Administrative Code NR104 needs to be removed.
- A TMDL needs to be completed for the 303d listed impaired reach of the Wolf River.
- Trout stream classifications of some streams may need to be changed as a result of the additional monitoring identified above.
- Stream assessment monitoring should be completed on Swim, Sterling, Shambaugh, Loper and Beeman Creeks to determine appropriate stream classifications. These streams are classified as trout water even though historic data does not support a cold water designation or data does not exist.



Wolf River at CTH MM Photo Credit M. Hazuga 2010

Lakes:

- Volunteer monitoring lake water quality and invasive species should be established at Chapman Lake.
- Chapman Lake habitat would benefit from placement of woody structure in the form of tree drops or cribs.

Wetlands:

- With 58% of original wetlands already lost, preservation of remaining wetland functional values, such as fish and wildlife habitat, runoff storage and filtering capacity should be a high priority.
- Where opportunities arise, wetland restoration should be promoted.
- Cropland practices that increase soil cover and decrease erosion and runoff to wetlands should be promoted.

Watershed:

- Reduce phosphorus loading to reduce excessive algae growth in Lakes Eau Claire and Altoona. Implement key best management practices on agricultural lands in the upper portion of this watershed for phosphorus control.
- Complete land use modeling report and use the results to better direct BMP selection in all contributing watersheds.

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Basin Education Initiative

Wisconsin DNR's mission involves preserving, protecting, and restoring natural resources. Watershed Planning provides a strategic review of water condition to enhance awareness, partnership outreach, and the quality of natural resource management.

North Fork Eau Claire River Watershed