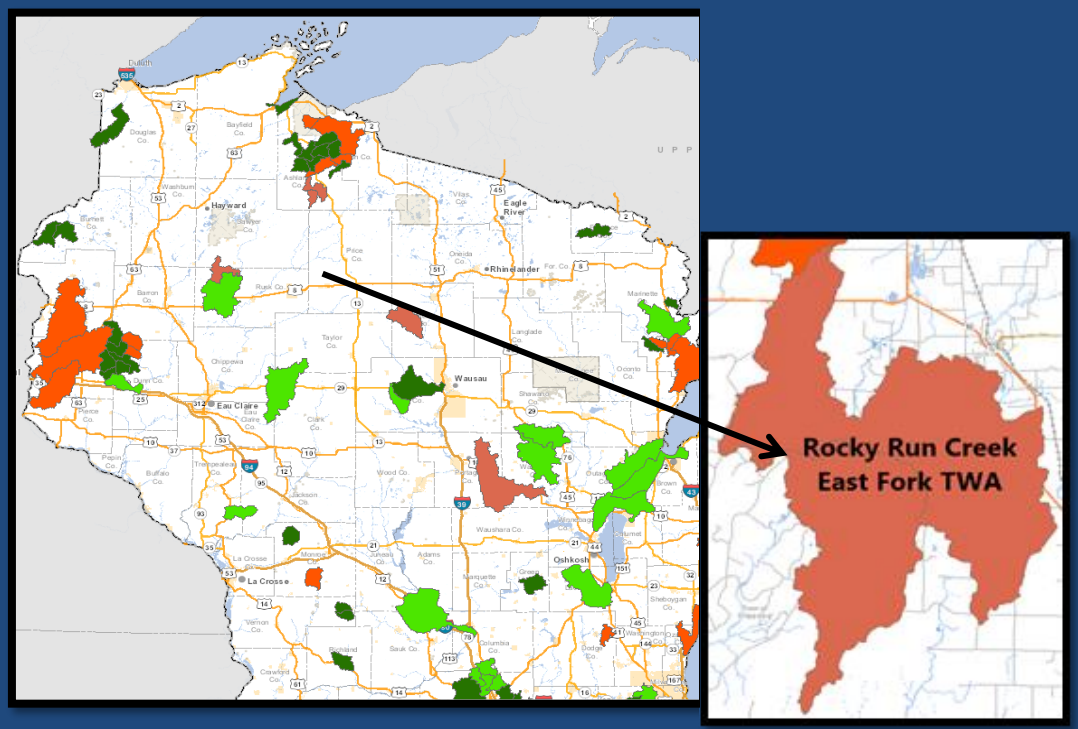
East Fork Chippewa River
Photo by Jeff Jackson, DNR

A Watershed Report created by the Bureau of Water Quality in support of the Clean Water Act.

ROCKY RUN CREEK AND MUSKELLUNGE CREEK EAST FORK CHIPPEWA RIVER TWA WQM PLAN 2017

East Fork Chippewa River (UC21)

HUC: 070500010208 and 07050010207, Monitored 2015



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Wisconsin Water Quality Monitoring and Planning

This Water Quality Management Plan was created under the state's Water Quality Management Planning and Water Resources Monitoring Programs. The plan reflects Water Quality Bureau and Water Resources Monitoring Strategy 2015-2020 goals and priorities and fulfills Areawide Water Quality Management Planning milestones under the Clean Water Act, Section 208. Condition information and resource management recommendations support and guide program priorities for the plan area.

This plan is hereby approved by the Wisconsin DNR Water Quality Program and is a formal update to the Upper Chippewa Areawide Water Quality Management Plan and Wisconsin's Statewide Areawide Water Quality Management Plan. This plan will be forwarded to USEPA for certification as a formal plan update.

Tom Aartila, Water Quality Bureau Field Supervisor — Date: 2-2-18

Greg Searle, Water Quality Bureau Field Operations Director — Date: 2/6/18

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Basin/Watershed Partners

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- Ashland County

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Abbreviations

BMP: **Best Management Practice**. A practice that is determined effective and practicable (including technological, economic, and institutional considerations) in preventing or reducing pollution generated from nonpoint sources to a level compatible with water quality goals.

DNR: **Department of Natural Resources.** Wisconsin Department of Natural Resources is an agency of the State of Wisconsin created to preserve, protect, manage, and maintain natural resources.

FIBI: **Fish Index of biological integrity (Fish IBI).** An Index of Biological Integrity (IBI) is a scientific tool used to identify and classify water pollution problems. An IBI associates anthropogenic influences on a water body with biological activity in the water and is formulated using data developed from biosurveys. In Wisconsin, Fish IBIs are created for each type of natural community in the state's stream system.

HUC: **Hydrologic Unit Code.** A code or sequence of numbers that identify one of a number of nested and interlocked hydrologic catchments delineated by a consortium of agencies including USGS, USFS, and Wisconsin DNR.

MIBI: **Macroinvertebrate Index of biological integrity.** In Wisconsin, the mIBI, or macroinvertebrate Index of biological integrity, was developed specifically to assess Wisconsin's macroinvertebrate community (see also Fish IBI).

Natural Community. A system of categorizing waterbodies based on their inherent physical, hydrologic, and biological assemblages. Both Streams and Lakes are categorized using an array of "natural community" types.

Monitoring Seq. No. Monitoring Sequence Number refers to a unique identification code generated by the Surface Water Integrated Monitoring System (SWIMS), which holds much of the state's water quality monitoring data.

SWIMS ID. Surface Water Integrated Monitoring System (SWIMS) Identification Code is the unique monitoring station identification number for the location where monitoring data was gathered.

TWA: **Targeted Watershed Assessment.** A statewide study design a rotating watershed approach to gathering of baseline monitoring data with specialized targeted assessments for unique and site-specific concerns, such as effectiveness monitoring of management actions.

WATERS ID: The Waterbody Assessment, Tracking and Electronic Reporting System Identification Code (WATERS ID) is a unique numerical sequence number assigned by the WATERS system, also known as "Assessment Unit ID code".

WBIC: **Water Body Identification Code.** DNR's unique identification codes assigned to water features in the state. The lines and information allow the user to execute spatial and tabular queries about the data, make maps, and perform flow analysis and network traces.

Executive Summary

The Rocky Run Creek East Fork of the Chippewa River and Muskellunge Creek East Fork of the Chippewa River HUC12 watersheds are healthy but vulnerable. The purpose of the Targeted Watershed Assessment Project was to collect baseline physical, biological, and chemical water quality data in these two HUC 12 watersheds. There is limited data to verify the health of these isolated watersheds. This new information will be used in future watershed management activities.

Fish and qualitative habitat surveys were conducted at 12 stream sites and macroinvertebrate samples were collected at nine sites. Water chemistry samples were collected monthly from Muskellunge Creek and the East Fork of the Chippewa River from May to October for phosphorus, nitrogen, total suspended solids (TSS).

The fish community of the East Fork of the Chippewa River is excellent based on the fish Index of Biotic Integrity (FIBI) scores, with a diverse mix of species, several of which are sensitive to pollution. The macroinvertebrate community was rated excellent based on macroinvertebrate Index of Biotic Integrity (MIBI) scores. Overall the water quality of the East Fork of the Chippewa River is excellent in the study area based on the biological, physical, and chemical attributes. The Headwater streams were dominated by tolerant forage fish and habitat quality is good. The macroinvertebrate community rated good to excellent in the headwater streams based on the MIBI. These headwater streams had high macroinvertebrate species richness and diversity, with many species intolerant to pollution. The streams in the Rocky Run and Muskellunge Creek TWA have limited anthropogenic influences that impact water quality. The Department considers these streams to be high quality waters fully meeting their biological potential.

East Fork of the Chippewa River at Forest Road 1285
Photo by Jeff Jackson, DNR

Watershed Discussion & Management Recommendations

Watershed Goals

The overall goal of this plan is to improve and protect water quality in the basin. This TWA (Targeted Watershed Assessment) monitoring project collected data in 2015 to assess the current condition of two HUC 12 watersheds within the East Fork Chippewa River Watershed (UC21). This plan is designed to present monitoring results, identify water resource issues, and make recommendations to improve or protect water quality consistent with Clean Water Act guidelines and state water quality standards.

Watershed Overview

The East Fork Chippewa River Watershed (UC 21) has 17 listed trout streams, more than any other watershed in the Upper Chippewa River Basin. The Watershed is predominantly wetland and forest, with limited agricultural activities. Glidden is the only Village in the watershed. Glidden has a wastewater treatment plant that discharges into the East Fork of the Chippewa River just south of the village (upstream of the two HUC 12s study area). The remaining residents have private septic systems.

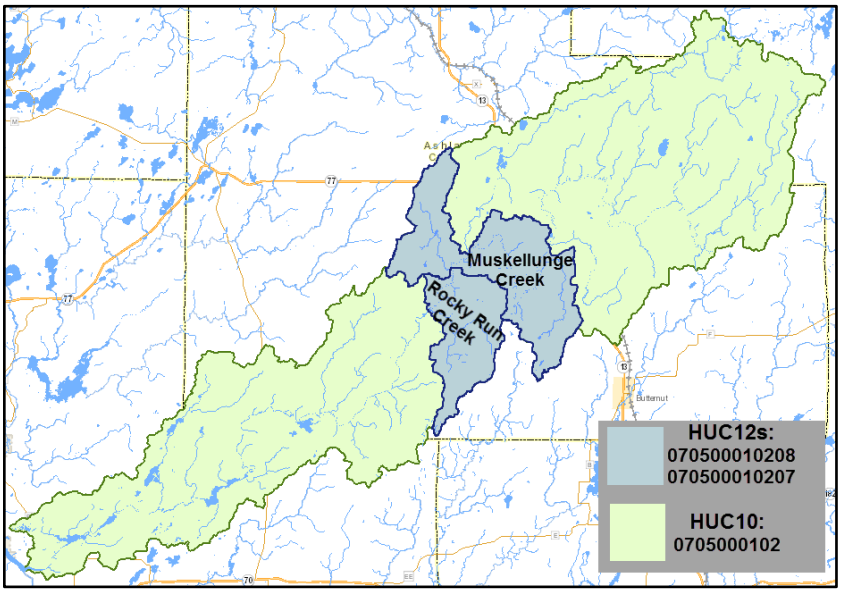

Figure 1: Rocky Run Creek (HUC12: 070500010207) and Muskellunge Creek 070500010208) TWA are shown within the East Fork Chippewa River (HUC1 0705000102).

Population, Land Use, Site Characteristics

The East Fork Chippewa River watershed (UC21) is 305.16 mi² (196,146 Acres). There are 310.53 stream miles, 2,431.41 lake acres and 65,073.81 wetland acres. The landscape in the area is primarily forest (53%), wetland (33%) and a mix of grassland (7%) and other uses. The watershed has a small agricultural presence that is dominated by grass fields and few row crop fields.

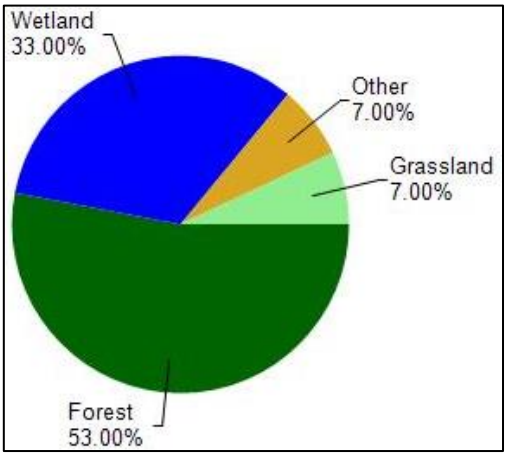

Figure 2: Landuse characteristics in the East Chippewa River watershed (UC21).

Hydrology

Soils in this area consist of sandy loam, sand, and silts. Much of the surface water in these watersheds originates from wetland drainage areas and are generally stained.

Ecological Landscapes

The North Central Forest Ecological Landscape occupies much of the northern third of Wisconsin. 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. 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 upland hardwood forest is dominant, made up of sugar maple, basswood, Yellow Birch, Balsam Fir, and also including some scattered hemlock and white pine pockets within stands. Aspen & White Birch stands are also relatively abundant due to timber harvest management practices. There is also a variety of forested and non-forested wetland spread across the landscape.

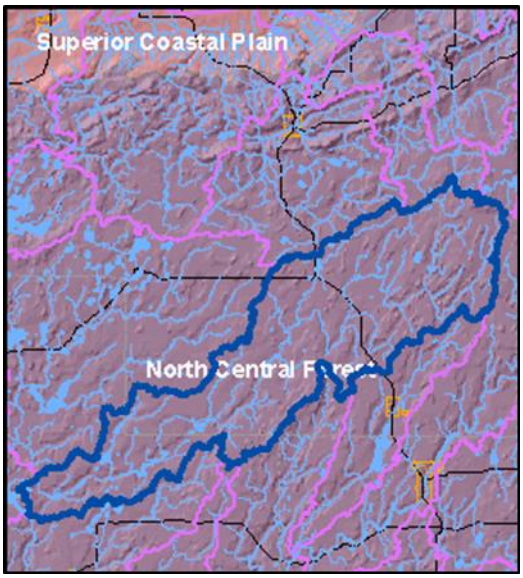

Figure 3: Ecological Landscapes in the East Fo Chippewa River watershed (UC21).

Ecological, Aquatic Resources

Outstanding and 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. There are no outstanding or exceptional resources waters in the Rocky Run/Muskellunge Creek East Fork TWA.

Table 1: Outstanding & Exceptional Resource Waters in East Fork Chippewa River watershed (UC21).*

Water Name	WBIC	ORW/ERW	Start Mile	End Mile
Augustine Creek	2411600	ERW	0	0.82
Augustine Creek	2410600	ERW	1.88	9.59
Barker Lake	2400000	ORW		
Blaisdell Lake	2402200	ORW		
East Fork Chippewa River	2399800	ORW	0	2.67
East Fork Chippewa River	2399800	ORW	3.53	4.37
East Fork Chippewa River	2399800	ORW	5.47	10.92
East Fork Chippewa River	2399800	ORW	13.57	32.42
East Fork Chippewa River**	2399800	ERW	32.83	52.23
East Fork Chippewa River	2399800	ORW	52.22	63.5
East Fork Chippewa River	2399800	ORW	63.5	74.07

*There are no outstanding or exceptional resources tributary waters in the Rocky Run Creek and Muskellunge Creek East Fork Chippewa River TWA. **The East Fork of the Chippewa River is an ERW water within the studied TWA boundary.

Trout Waters

DNR uses three categories to classify different types of trout streams. Wisconsin Trout Stream Maps provide a comprehensive list of trout streams covering the majority of the state. Efforts have been made to list all trout streams in the State of Wisconsin, but this listing in not exhaustive. The majority of the trout streams in the East Fork of the Chippewa River Watershed (UC21) are class II and class III (Table 2).

High quality trout waters (Class I) have sufficient natural reproduction to sustain populations of wild trout, at or near carry capacity; consequently, streams in this category require no stocking of hatchery trout. These streams or stream sections are often small and may contain small or slow-growing trout, especially in the headwaters. Class II streams may have some natural reproduction, but not enough to utilize available food and space; stocking is required to maintain a desirable sport fishery. These streams have good survival and carryover of adult trout, often producing some fish larger than average size. Class III are marginal trout habitat with no natural reproduction occurring. They require annual stocking of trout to provide trout fishing. Generally, there is no carryover of trout from one year to the next.

Table 2: List of Trout Waters in East Fork Chippewa River watershed (UC21).

Water Name	WBIC	Start Mile	End Mile (acres)	Trout Class
Augustine Creek	2411600	0	0.82	CLASS I
Augustine Creek	2410600	0	1.88	CLASS II
Augustine Creek	2410600	1.88	9.59	CLASS I
Bay Spring Creek*	2405000	0	0.27	CLASS II
Bay Springs*	2405100			CLASS II
Bear Creek	2409600	0	1.74	CLASS II
Camp Fifteen Creek	2404400	0	2.55	CLASS II
Dorns Creek*	2407600	0.86	3.56	CLASS III
Dorns Creek*	2407600	3.57	6.8	CLASS II
Dryden Creek	2406200	10.82	16.41	CLASS II
East Branch Augustine Creek	2410900	0.82	2.65	CLASS III
East Fork Chippewa River	2399800	63.5	74.07	CLASS III
East Fork Chippewa River	2399800	74.07	74.45	CLASS III
East Fork Chippewa River	2399800	74.46	83.61	CLASS II
Kempf Springs	2407400			CLASS II
Kempf Springs Creek*	2407300	0	0.54	CLASS II
Kenyon Spring Creek*	2405500	0	0.68	CLASS II
Kenyon Springs*	2405700			CLASS II
Magee Creek	2408700	0	12.56	CLASS III
Magee Creek	2408700	12.56	15.81	CLASS III
Meyers Creek	2408500	0	3.52	CLASS III
Muskellunge Lake Feeder	2406000	0	1.23	CLASS II
Reins Creek	2404500	0	1.29	CLASS II
Rocky Run*	2404900	0	4.88	CLASS III
Sheridan Creek	2407500	0	1.03	CLASS II
Silver Creek	2411700	0	4.19	CLASS II
Willerth Creek	2410100	0	5.3	CLASS II

*Trout managed waters in the Rocky Run/Muskellunge Creek East Fork Chippewa TWA.

Impaired Waters

Every two years, Section 303(d) of the Clean Water Act requires states to publish a list of all waters that do not meet water quality standards. The list, also known as the Impaired Waters List, is updated to reflect waters that are newly added or removed based on new information. Gates Lake is the only waterway listed as impaired in the Rocky Run/Muskellunge Creek East Fork Chippewa River TWA, for mercury in fish tissue from atmospheric deposition (Table 3).

Table 3: List of impaired waters in the East Fork Chippewa River watershed (UC21).

Water Name	WBIC	Acres	Pollutant	Impairment	Source	WQ Standards Status
Bear Lake	2403200	204	Mercury	Contaminated Fish Tissue	Atmospheric Deposition	Listed as Impaired
Black Lake (Birch)	2401300	129				
Fishtrap Lake	2401100	216				
Gates Lake*	1850200	22				
Two Axe Lake	1887200	57				

*Gates Lake is an impaired waterbody in the Rocky Run East Fork TWA.

Monitoring Project Discussion

Project Purpose

The purpose of the project was to collect baseline physical, biological, and chemical water quality data in two HUC 12 watersheds, Rocky Run Creek and Muskellunge Creek. There is limited data available to assess and verify the health and condition these isolated watersheds. This new information will be used in future watershed management activities; including updating waterbody assessment status (i.e. future monitoring for 303(d) or ERW/ORW status), making management recommendations, updating water body and watershed narratives in WATERS, and for watershed planning.

Project Area

The TWA project area included two HUC 12's; the Rocky Run Creek East Fork of Chippewa River and Muskellunge Creek East Fork Chippewa River watersheds. These watersheds are located within three townships in Ashland County; Chippewa, Jacobs, and Shannagolden. These townships have populations of 374, 715, and 125 respectively; Shannagolden makes up the majority of the watershed's land area.

The Rocky Run Creek and Muskellunge Creek East Fork of Chippewa River TWA encompasses 33,192 acres of the total 196,146 acres of the HUC10 East Fork Chippewa River.

Site Selection and Study Design

Watershed monitoring sites were selected based on stream access, natural community modeling transitions, and position within the watershed. These watersheds contained many streams with limited road access. Site selection focused on existing road crossing, previous fisheries management sites, and access via public lands (except for the lower site on Dorn's Creek which was accessed via private land with permission).

Data was collected during the 2015 field season. Fish and qualitative habitat surveys were conducted at 12 stream sites and macroinvertebrate samples were collected at nine of the 12 sites (Figures 4, Table 4). Water chemistry samples were collected monthly from Muskellunge Creek and the East Fork of the Chippewa River during the growing season (May through October) for nutrients (phosphorus and nitrogen) and Total Suspended Solids (TSS) (Figure 4, Table 4). The sites were located at the furthest downstream road crossing or access point within the HUC 12's to best represent each watershed. A suitable road crossing/access site was not available on Rocky Run Creek.

Data was entered into the Fish and Habitat Management and SWIMS databases during the winter of 2015 and the spring to 2016.

Figure 4: Map of stations in Rocky Run and Muskellunge Creek TWA.

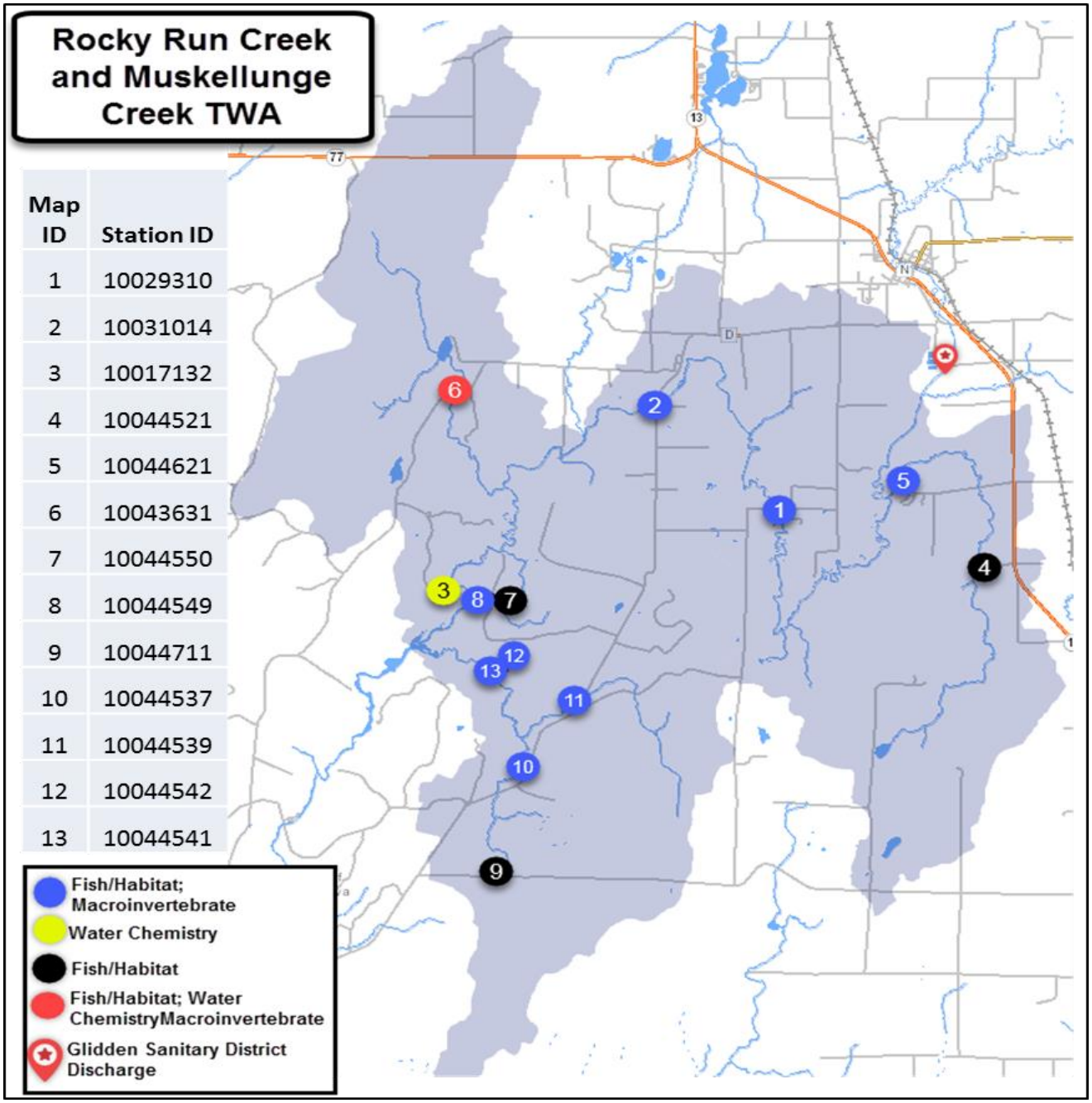

Table 4: List of monitoring stations in Rocky Run and Muskellunge Creek TWA.

Map ID	WBIC	SWIMS ID	Station Name	Natural Community	Stream Order	Parameters Monitored
1	2399800	10029310	East Fork of Chippewa River 55m US Bay Rd	Cool-Warm Main Stem	4	Fish/Habitat; Macroinvertebrate
2	2399800	10031014	East Fork of Chippewa River - US Bay Rd	Cool-Warm Main Stem	4	Fish/Habitat; Macroinvertebrate
3	2399800	10017132	East Fork Chippewa River - Near Canoe Access Site	Cool-Warm Main Stem	4	Water Chemistry
4	2407600	10044521	Dorns Creek US Hank Bucheger Rd	Cool-Warm Headwater	2	Fish/Habitat
5	2407600	10044621	Dorns Creek 575m US East Fork Chippewa River Confluence	Cool-Warm Headwater	2	Fish/Habitat; Macroinvertebrate
6	2405800	10043631	Muskellunge Creek DS Forest Rd.	Cool-Warm Headwater	2	Fish/Habitat; Macroinvertebrate Water Chemistry
7	2405100	10044550	Un Trib to East Fork Chippewa River 10m US Kenyon Road	Cool-Warm Headwater	1	Fish/Habitat
8	2405400	10044549	Un Trib East Fork of Chippewa River 110 DS Kenyon Rd	Cool-Warm Headwater	1	Fish/Habitat; Macroinvertebrate
9	n/a	10044711	Un Trib to Rocky Run Creek 130m DS Bear Lake Road	Cool-Warm Headwater	1	Fish/Habitat
10	2404900	10044537	Rocky Run Cr. 1280m DS of Right of Way Road	Cool-Warm Headwater	2	Fish/Habitat; Macroinvertebrate
11	2405200	10044539	Un Trib Rocky Run Creek DS Right of Way Road	Cool-Warm Headwater	2	Fish/Habitat; Macroinvertebrate
12	n/a	10044542	Un Trib to Bay Spring Cr.20m US Confluence	Cool-Cold Headwater	1	Fish/Habitat; Macroinvertebrate
13	2405000	10044541	Bay Spring Creek DS Bay Spring Pond	Cool-Cold Headwater	1	Fish/Habitat; Macroinvertebrate

Methods, Equipment and Quality Assurance

Fish Assemblage

The fish community was assessed by electroshocking a set station. Station length was determined based on 35x the mean stream width; with a minimum of 100m and a maximum of 400m station length (Lyons, 1992). A stream stocker with a generator and two probes was used on the larger sites. A backpack shocker with a single probe was used at sites generally less than 3 meters wide. All fish were collected, identified, and counted and all gamefish were measured for length.

The fisheries assemblage was collected with the following methods:

- Wadeable Stream Fish Community Evaluation Form 3600-230 (R 7/00)
- Guidelines for Assessing Fish Communities of Wadeable Streams in Wisconsin

Habitat Evaluation

At each fish survey site, a qualitative habitat assessment was conducted. This included average stream width and depth, riparian buffers and land use, evidence of sedimentation, fish cover, stream bed substrate, etc. (Simonson, et. al., 1994).

- Guidelines for Qualitative Physical Habitat Evaluation of Wadeable Streams
- Qualitative Habitat Rating less that 10m Form (3600-532A) (R 6/07)

Macroinvertebrate Evaluation

Macroinvertebrate samples were collected using a D-frame net in fall, 2015. Riffle samples were collected when the appropriate substrates were available. If riffles were absent in the survey station, vegetation sweeps were conducted (WDNR 2000). Samples were sent for analysis to the University of Wisconsin-Stevens Point Entomology Lab.

- Guidelines for Collecting Macroinvertebrate Samples in Wadeable Streams
- Wadeable Macroinvertebrate Field Data Report Form 3200-081 (R 08/14)

Water Sampling

Water chemistry grab samples were collected from the center of the stream channel where adequate flow and depth were present. Samples were field preserved and shipped in coolers on ice for analysis at the Wisconsin State Lab of Hygiene (WDNR 2005).

- Guidelines and Procedures for Surface Water Grab Sampling (Dec. 2005 Version 3)

Project Results

Fish Species

The fish community is an environmental indicator that can help characterize the water quality of a stream resource. Fish species are classified as tolerant, intermediate and intolerant and can indicate the presence of environmental stressors including thermal, chemical, or habitat issues.

Survey sites included two mainstem sites on the East Fork of the Chippewa River and 10 headwater tributary sites on named and unnamed streams (Table 5). A total of 24 species of fish were captured in the 12 fish surveys. Fourteen fish species were found in headwater streams including 6 tolerant and 1 intolerant species. Seventeen species of fish were found in the mainstem sites including 2 tolerant and 4 intolerant species. Seven fish species were found in both headwater and mainstem sites (Table 5).

Table 5: Fish species sampled on the East Fork Chippewa River and tributaries.

Site Number:	1	2	4	5	6	7	8	9	10	11	12	13	
SWIMS Station ID:	10029310	10031014	10044521	10044621	10043631	10044550	10044549	10044711	10044537	10044539	10044542	10044541	
Station Name:	E.F. Chippewa R. 55m US Bay Rd.	E.F. Chippewa R. US Bay Rd	Dorns Cr. US Hank Bucheger Rd	Dorns Cr. 575 m US Confluence of E.F. Chippewa R.	Muskellunge Cr. DS Forest Rd	Un Trib to E.F. Chippewa R. 10m US Kenyon Rd	Un Trib. E.F. Chippewa R. 110m DS Kenyon Rd	Un Trib to Rocky Run Cr. DS Bear Lake Rd.	Rocky Run Cr. 1280m DS Right of Way Rd	Un Trib to Rocky Run Cr. DS Right of Way Rd	Un Trib to Bay Spring Cr. 20m US Confluence	Bay Spring Cr. DS of Bay Spring Pond	Fish Species Tolerance Rating
Brook stickleback			49				4		14	31	43	6	Tolerant
White sucker	8	7	1				22		5		87	18	Tolerant
Burbot	39	44		8	1		8		4		1	2	Intermediate
Creek chub			16			4	17		41	67		70	Tolerant
Common shiner		30									1	10	Intermediate
Finescale dace						8			15	18	11	4	Intermediate
Northern redbelly dace			3						2			1	Intermediate
Central mudminnow	25		24	23		3	10	26	14	4	6		Tolerant
Northern pike	3			2									Intermediate
Blacksided darter	24	13		2									Intermediate
Walleye	1	3											Intermediate
Johnny darter	7												Intermediate

Station Name:	E.F. Chippewa R. 55m US Bay Rd.	E.F. Chippewa R. US Bay Rd	Dorns Cr. US Hank Bucheger Rd	Dorns Cr. 575 m US Confluence of E.F. Chippewa R.	Muskellunge Cr. DS Forest Rd	Un Trib to E.F. Chippewa R. 10m US Kenyon Rd	Un Trib. E.F. Chippewa R. 110m DS Kenyon Rd	Un Trib to Rocky Run Cr. DS Bear Lake Rd.	Rocky Run Cr. 1280m DS Right of Way Rd	Un Trib to Rocky Run Cr. DS Right of Way Rd	Un Trib to Bay Spring Cr. 20m US Confluence	Bay Spring Cr. DS of Bay Spring Pond	Fish Species Tolerance Rating
Rock bass	2	1											Intolerant
Shorthead redhorse	10	6											Intermediate
Fantail darter	8	9			4								Intermediate
Hornyhead chub		3											Intermediate
Log perch		6											Intermediate
Northern Hog sucker		5											Intolerant
Blacknose shiner		1							3				Intolerant
Longnose dace													Intermediate
Carmine shiner		7											Intolerant
Golden shiner					1								Tolerant
Western blacknose dace		17							1				Tolerant
Pearl dace											1		Intermediate

The most common fish species collected from the headwater tributaries were creek chub, brook stickleback, white sucker, central mudminnow and fine scale dace. These species accounted for 93% of the total fish collected in the headwater streams. Eighty-five percent of the total fish captured in Headwater streams were tolerant species (Figure 5). Two Northern Pike were the only gamefish captured in the headwater streams. Both were captured in Dorn's Creek US from the Confluence of the East Fork Chippewa River.

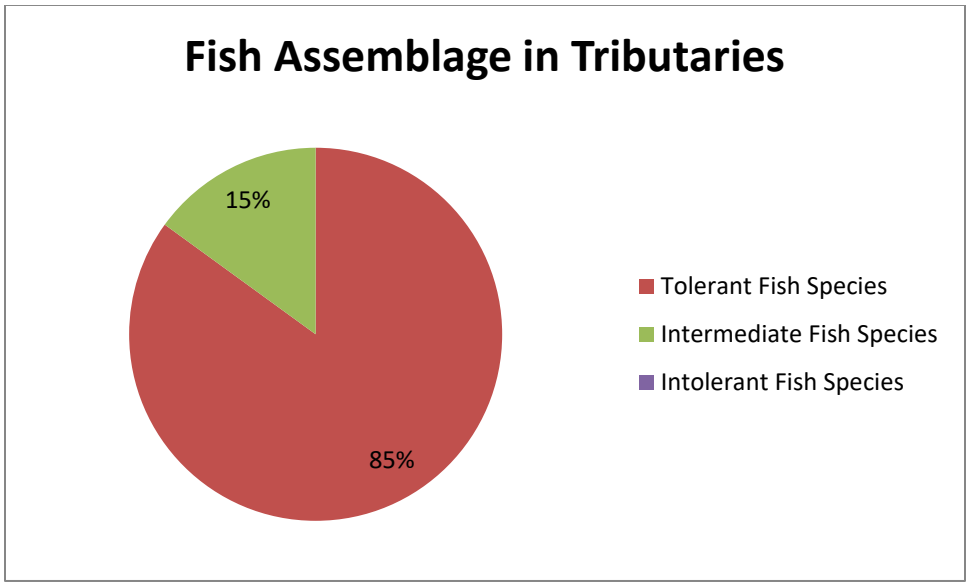

Figure 5: Fish assemblage in East Fork Chippewa River tributaries.

The most common fish species collected from the two mainstem sites were burbot, blackside darter, common shiner, central mudminnow, fantail darter and longnose dace. These species accounted for 75% of total fish collected at mainstem sites. Fourteen percent of the total fish captured were tolerant species (Figure 6).

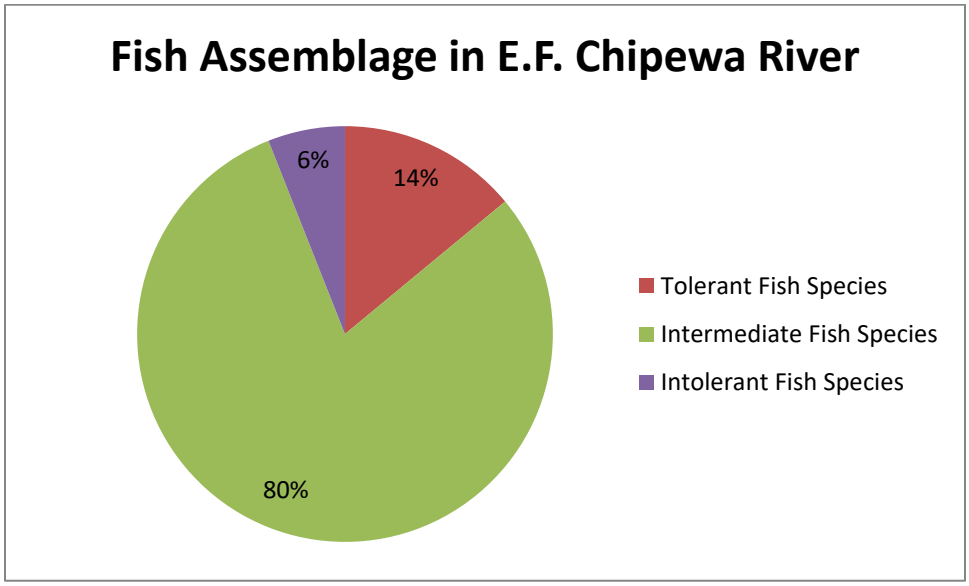

Figure 6: Fish assemblage in E. Fork Chippewa River.

There are 8 listed trout waters in the two HUC 12 watersheds studied (Table 2). Three listed trout streams, Bay Spring Creek, Dorn's Creek and, Rocky Run Creek were surveyed. No trout were captured in the Rocky Run/Muskellunge Creek East Fork of the Chippewa River TWA project in 2015.

Natural Community Analysis

The majority of streams in these HUC 12's are modelled to be cool-warm transitional headwaters or cool-warm main stems (Lyons, 2008). The department has recently developed a draft method to determine whether or not the modeled natural community is accurate based on the fishery assemblage and climate conditions (Lyons, 2013). The modeled natural communities were verified as correct for all of the sites in these HUC 12 watersheds (Table 6).

Index of Biological Integrity Findings

The Cool-Warm and Headwater IBIs (Lyons, 2012), were applied to the fish sites based on the natural community indicated by the fishery assemblage. The main stem sites on the East Fork of the Chippewa River scored excellent IBI ratings (Table 6). The headwater streams scored poor to good. Two sites had too few fish captured to calculate a fish IBI (Table 6).

Table 6: Natural community, fish IBI score and rating, and habitat score and rating for sites in the Rocky Run and Muskellunge Creeks TWA.

Map ID	Station Number	Station Name	Natural Community	Stream Order	Fish IBI	Fish Rating	Habitat Score	Habitat Rating
1	10029310	East Fork of Chippewa River 55m US Bay Rd	Cool-Warm Main stem	4	70	Excellent	53	Good
2	10031014	East Fork of Chippewa River US Bay Rd	Cool-Warm Main stem	4	100	Excellent	95	Excellent
4	10044521	Dorns Cr. US Hank Bucheger Road.	Cool-Warm Headwater	2	50	Fair	53	Good
5	10044621	Dorns Creek 575m US E.F. Chippewa River Confluence	Cool-Warm Headwater	2	30	Poor	72	Good
6	10043631*	Muskellunge Creek DS Forest Road	Cool-Warm Headwater	2	n/a	n/a	65	Good
7	10044550*	Unnamed Trib to East Fork Chippewa River 10m US Kenyon Road	Cool-Warm Headwater	1	n/a	n/a	58	Good
8	10044549	Unnamed Trib East Fork of Chippewa River 110m DS Kenyon Rd	Cool-Warm Headwater	1	20	Poor	63	Good

Map ID	Station Number	Station Name	Natural Community	Stream Order	Fish IBI	Fish Rating	Habitat Score	Habitat Ranking
9	10044711	Unnamed Trib to Rocky Run Creek 130m DS Bear Lake Road	Cool-Warm Headwater	1	0	Poor	68	Good
10	10044537	Rocky Run 1280m DS of Right of Way Road	Cool-Warm Headwater	2	90	Good	63	Good
11	10044539	Unnamed Trib Rocky Run Creek DS Right of Way Road	Cool-Warm Headwater	2	50	Fair	53	Good
12	10044542	Unnamed Trib to Bay Spring 20m us Confluence	Cool-Cold Headwater	1	80	Good	58	Good
13	10044541	Bay Spring Creek DS Bay Spring Pond	Cool-Cold Headwater	1	60	Fair	38	Fair

*Sites with too few fish captured to calculate Fish IBI score and rating.

Habitat Scores

Stream and riparian habitat quality were assessed at all fish survey stations based on DNR "Wadable Stream Qualitative Fish Habitat Rating" guidance (Simonson et.al, 1994). Habitat scores on the two main stem sites were good and excellent. These sites had stable banks, excellent thalweg depths, and good cover for fish. Nine of the ten headwater sites had a good habitat rating (Table 6). Bay Spring Creek DS Bay Spring Pond had a fair habitat rating (Table 6). Headwater streams tended to be lower gradient wetland fringed streams with limited pool areas and finer bed sediments. The undeveloped nature of the watershed resulted in high quality riparian buffers. The low gradient channels had limited bank erosion and good fish cover.

Macroinvertebrate Data

Macroinvertebrate samples were collected at 9 sites for this project; 2 on the mainstem of the East Fork Chippewa River and 7 in headwater streams (Figure 7). The mainstem sites had excellent MIBI ratings and very good to excellent HBI ratings (Table 7). The headwater streams had good to excellent MIBI ratings and fair to good HBI ratings. Overall these watersheds had diverse macroinvertebrate communities with a high percentage of sensitive species represented in the samples.

Table 7: MIBI and HBI scores and ratings, Species Richness, Shannon Diversity, percent chironomidae individual, and EPT % Individual for sample locations in the Rocky Run Creek and Muskellunge Creek TWA.

Map ID	SWIMS Station ID	Station Name	MIBI	MIBI Rating	HBI	HBI Rating	Species Richness	Shannon Diversity	% Chironomidae Individual	EPT % Individual
1	10029310	E.F. Chippewa R. 55 US Bay Rd	9.57	Excellent	4.421	Very Good	62	4.937	20	40
2	10031014	E.F. Chippewa R. US Bay Rd	8.38	Excellent	2.52	Excellent	39	4.391	9	67.692
5	10044621	Dorns Cr 575m US E.F. Chippewa R. Confluence	5.48	Good	5.893	Fair	31	3.652	25	40.645
6	10043631	Muskellunge Cr. DS Forest Rd.	8.74	Excellent	5.046	Good	39	4.705	28	42.748
8	10044549	Un Trib. E.F. Chippewa R. 110 DS Kenyon Rd	7.93	Excellent	4.8	Good	25	4.07	36	46
10	10044537	Rocky Run Cr. 1280m DS of Right of Way Rd	5.96	Good	5.246	Good	42	4.483	43	39.063
11	10044539	Un Trib. Rocky Run Cr. DS Right of Way Rd.	7.26	Good	5.879	Fair	25	3.876	33	28.346
12	10044542	Un Trib. Bay Spring 20m US Confluence	6.69	Good	4.647	Good	41	4.489	34	41.6
13	10044541	Bay Spring Cr DS Bay Spring Pond	8.75	Excellent	4.966	Good	33	3.871	43	40.909

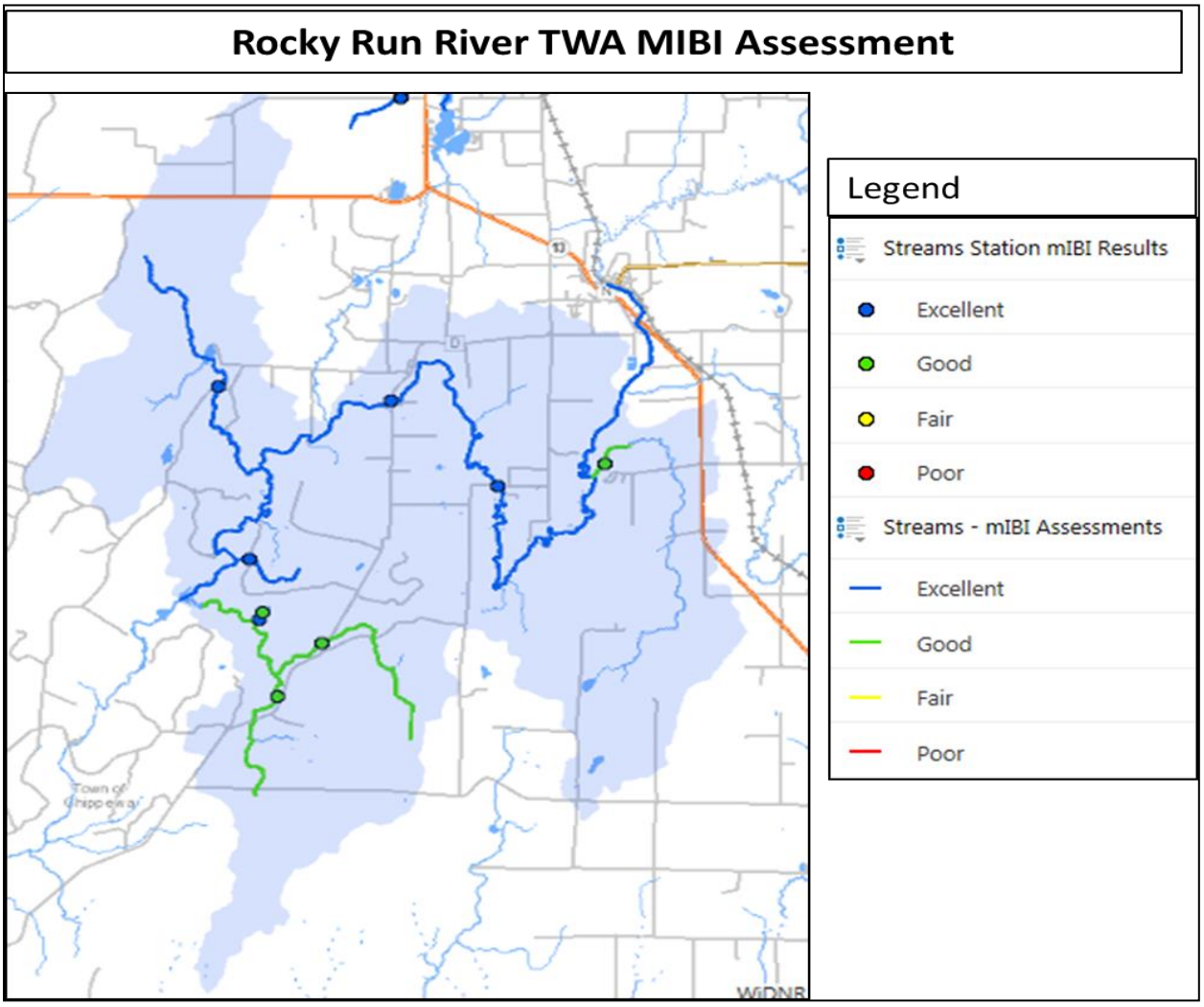

Figure 7: MIBI results in the Rocky Run/Muskellunge Creek East Fork Chippewa River TWA.

Water Chemistry

Water chemistry was sampled at two sites; the East Fork of the Chippewa River (SWIMS Station ID: 10017132) and Muskellunge Creek (SWIMS Station ID: 10043631). Six samples were collected monthly during the growing season (May through October) in 2015 for Total Phosphorus, Ammonia as N, Nitrate+Nitrate, Total Nitrogen, and, Total suspended solids (Table 8, Table 9). Field measurements of dissolved oxygen, temperature, specific conductance, pH, and a transparency were recorded at each sampling event.

The total Phosphorus concentration for the East Fork of Chippewa River ranged from 0.0285mg/L – 0.0505 mg/L with an average of 0.0390 mg/L (Figure 8, Table 8). The total Phosphorus concentration for Muskellunge Creek ranged from 0.0166 mg/L – 0.038 mg/L with an average of 0.0308 mg/L (Figure 9, Table 9). These total Phosphorus values for both sites are well below the statewide standard in NR 102 WI Adm. Code of 0.075mg/L. Total suspended solids were not detected in

samples from Muskellunge Creek and ranged from no detect to 3.6 mg/L in the East Fork of the Chippewa River.

Table 8: Monthly water chemistry results during the growing season (May to October) for the East Fork Chippewa River site.

East Fork Chippewa River Site (SWIMS Station ID: 10017132)							
	Sample Date in 2015						
Parameter Measured	05/29	06/26	07/30	08/27	09/21/	10/27	2015 Average
Suspended Solids (mg/L)	3.6	3.2	2.6	2	2.2	1.25	2.4750
NH3 (mg/L)	0.0201	0.0346	0.0254	0.0176	0.0167	0.0203	0.0225
N-Total (mg/L)	0.851	0.869	0.755	0.423	0.586	0.546	0.6717
N NO_3 + NO_2 (mg/L)	0.026	0.0858	0.0558	0.0095	0.0359	0.0518	0.0441
Phosphorus Total (mg/L)	0.0409	0.0505	0.0429	0.0285	0.0383	0.0329	0.0390

The Level of Detection (LOD) for suspended solids is 1.25 mg/L and the LOD for N NO3 + NO2 is 0.0095 mg/L.

Table 9: Monthly water chemistry results during the growing season (May to October) for the Muskellunge Creek site.

Muskellunge Creek (SWIMS Station ID: 10043631)							
	Sample Date in 2015						
Parameter Measured	05/29	06/26	07/30	08/27	09/21	10/27	2015 Average
Suspended Solids (mg/L)	1.25	1.25	1.25	1.25	1.25	1.25	1.25
NH3 (mg/L)	0.0075	0.0229	1.0299	0.0425	0.0258	0.0384	0.0278
N-Total (mg/L)	0.745	0.984	1.24	0.859	1.05	1.07	0.9913
N NO_3 + NO_2 (mg/L)	0.0095	0.0095	0.0095	0.0095	0.0095	0.0589	0.0177
Phosphorus Total (mg/L)	0.0166	0.0244	0.038	0.0368	0.0343	0.0349	0.0308

The Level of Detection (LOD) for suspended solids is 1.25 mg/L and the LOD for N NO3 + NO2 is 0.0095 mg/L.

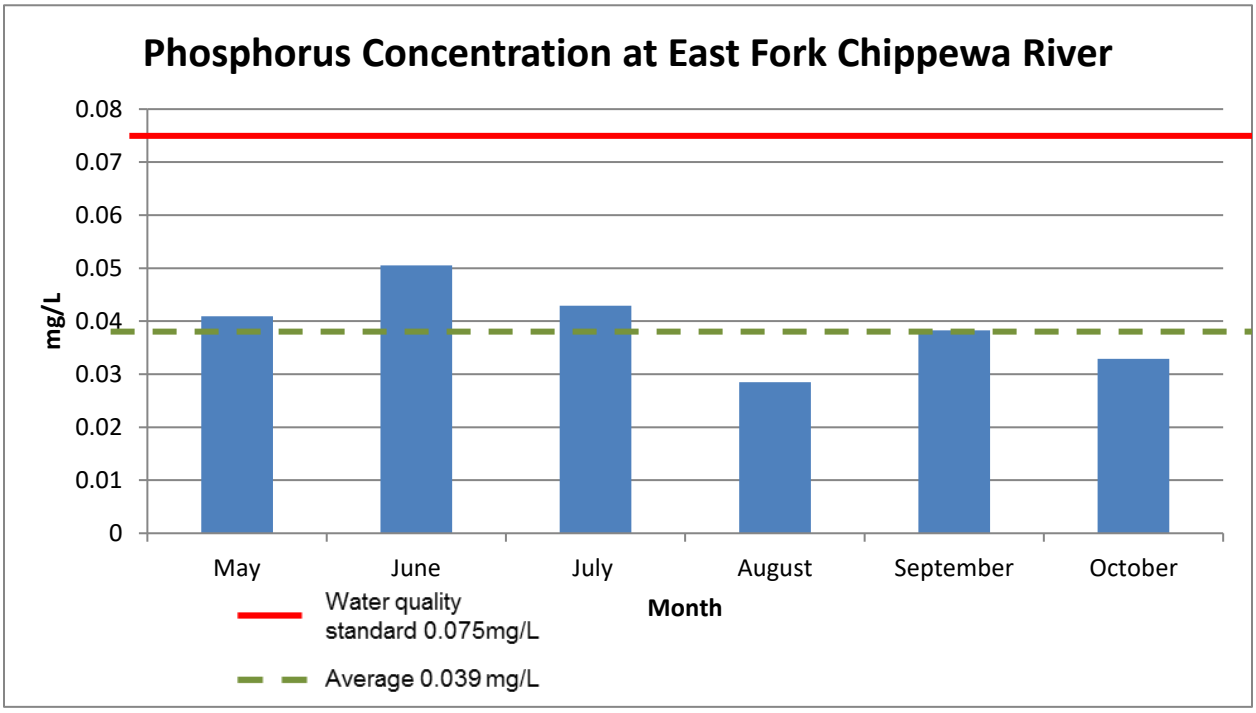

Figure 8: Phosphorus concentrations 2015 field season in the East Fork Chippewa River.

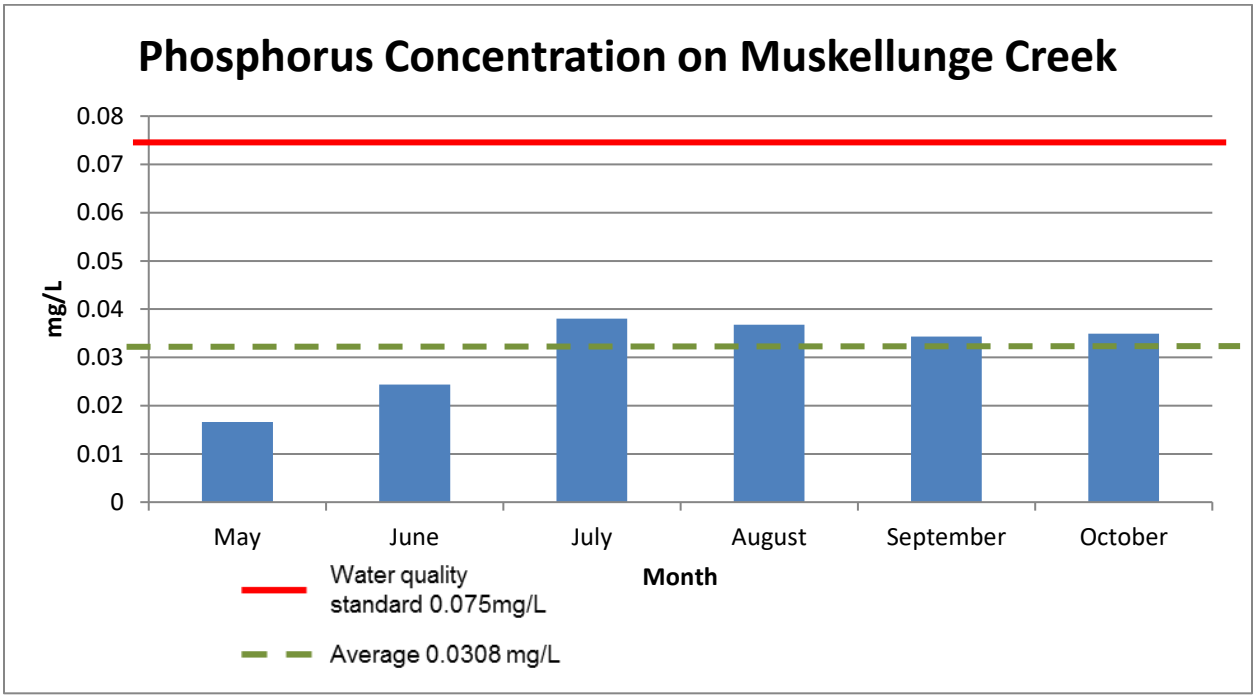

Figure 9: Phosphorus concentrations 2015 field season in the Muskellunge Creek.

In general, the dissolved oxygen, pH, temperature, and specific conductance values were all within ranges typically found in northern Wisconsin watersheds (Table 10 and Table 11). The specific conductance of Muskellunge Creek measured during the growing season ranged from 32-66 microsiemens. These are low specific conductance values and make fish sampling by electrofishing ineffective. In addition, transparency was greater than 120 cm for all monthly readings except in July during the fish survey when the transparency was 83cm. These values may explain the low number of fish captured during the July 16, 2015 fish survey.

Table 10: Field parameters measured in the Muskellunge Creek in 2015.

Muskellunge Creek	Sample Date in 2015					
	5/29	6/26	7/30	8/27	9/21	10/27
Temperature (°C)	17.9	23.6	23.9	16.7	16.6	7.1
Dissolved Oxygen (mg/L)	6.4	8.5	5.9	6.9	8.8	7.6
Dissolved Oxygen (% Saturation)	67.2	101	70.7	81.4	90.5	62.5
pH	7.3	5.2	7.1	7.2	7	6.8
Conductivity (microsiemens)	32	41	55	66	62	52
Transparency (cm)	> 120	n/a	68	>120	110	>120

Table 11: Field parameters measured in the East Fork Chippewa River in 2015.

East Fork Chippewa River	Sample Date in 2015					
	5/29	6/26	7/30	8/27	9/21	10/27
Temperature (°C)	17.3	19.7	22.1	15.6	16.6	6.9
Dissolved Oxygen (mg/L)	6.5	7.5	6.8	8.2	8.8	10.9
Dissolved Oxygen (% Saturation)	67.8	83.3	77.8	82.4	90.5	90
pH	8.2	6.6	7.4	7.4	7	6.9
Conductivity (microsiemens)	67	90	124	135	62	123
Transparency (cm)	>120	n/a	>120	>120	110	>120

Discussion

Streams within the studied watersheds are surrounded by large upland forests and wetland complexes. There is limited development, mostly seasonal and permanent residences and little agriculture in these watersheds. Forestry and recreation are the primary anthropogenic influences in the area. Land use is managed for timber production and private recreational activities. If timber producers follow forestry best management practices, the greatest threat to water quality is road development and maintenance.

The mainstem sites of the East Fork of the Chippewa River are moderate gradient with large floodplains dominated by forests and wetlands. In these HUC 12s the watershed contains limited residential development and agricultural lands. The waterway's shoreline buffers are intact and the stream banks show limited erosion. The stream bed is stable and varies from sand to rock and boulder. Water depth is excellent and cover for fish is abundant. The fish community is excellent based on the fish IBI scores, with a diverse mix of species, several of which are sensitive to pollution. The macroinvertebrate community was rated excellent based on macroinvertebrate IBI scores.

Overall the water quality of the East Fork of the Chippewa River is excellent in the study area based on the biological, physical, and chemical attributes.

The Glidden Sanitary District is the only point source located on the East Fork of Chippewa River. This facility is located 15 miles upstream of the chemistry site on the East Fork of the Chippewa River and is a source of phosphorus for areas downstream. The Glidden facility currently has a discharge permit issued by DNR which expires in 2017. The facility consists of a three-cell pond system with no phosphorus discharge limits and has an annual flow average of 60,000 gallons per day. Discharge from the facility is authorized during the months of April to June and September to November annually. In accordance with their permit, the facility is scheduled to obtain weekly effluent grab samples to determine phosphorus concentration. The average phosphorus concentration reported to DNR by the Sanitary District for May 2015 was 0.8775 mg/L and for June 2015 was 1.0634 mg/L. The total phosphorus concentrations collected at site 3 on the East Fork of the Chippewa River were well below state standards and were similar during all months, including the months the facility was permitted to discharge. This data suggest that the influence of the treatment plant is limited or even un-detectable at site 3. However, it is unknown if the facility discharged the maximum allowed under its permit during the study period.

The headwater streams are generally low gradient, with wetland dominated watersheds and intact shoreline buffers. Fine sediments, low stream flows, and lower dissolved oxygen concentrations are typical in these headwater streams. Beaver dams are common throughout these watersheds and are likely influencing fish, habitat, and water quality. The stream habitat conditions are generally rated good and fish communities are dominated by tolerant forage fish. The macroinvertebrate community generally rated good to excellent in the headwater streams based on the MIBI. The MIBI has shown the combination of watershed land cover and local riparian and instream conditions strongly influence one another (Weigel, 2003). The HBI for the same sites rated water quality fair to good. This index measures macroinvertebrate tolerance to low dissolved oxygen. These low gradient streams with organic influences, such as from wetlands, often scores lower than high gradient hard bottom streams. These headwater streams had high species richness and diversity and organisms intolerant to pollution were commonly found. The streams in the Rocky Run and Muskellunge Creek TWA have limited anthropogenic influences that impact water quality. The DNR considers these streams to be high quality waters fully meeting their biological potential.

Management Recommendations

- Ensure that ***Wisconsin's Forestry Best Management Practices (BMPs) for Water Quality*** are implemented with partners including Ashland County, US Forest Service, industrial forest owners, private landowners, and other potential partners.
- Maintain culverts and conduct periodic culvert audits to verify adequate water flow, confirm the avoidance of excessive sedimentation, and determine allowable fish passage with partners.
- Manage Beaver populations in designated trout waters with the US Forest Service and other potential partners.

Monitoring and Assessment Recommendations

- DNR Fisheries staff should re-assess waters managed for trout within these watersheds. No trout were collected during this study.
- DNR fisheries or Water Quality staff should consider a thermal study with continuous temperature probes to evaluate the coldwater potential of managed trout waters in these watersheds.

- Water Quality staff should re-survey Muskellunge Creek for fish to re-evaluate the fish community.
- Water Quality staff should re-survey Dorn's Creek for fish to re-evaluate the fish community.

Bay Springs
Photo by Jeff Jackson, DNR

Appendix A: References

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Appendix B: Waterbody Narratives

*Indicates the waterbody was monitored in 2015 as part of this study.

Bay Springs

WBIC: 2405100

Bay Springs is a small spring pond with an outlet stream flowing into Rocky Run Creek. It is designated a Class II Trout Water by DNR Fisheries Management. The pond is almost devoid of aquatic macrophytes. Its riparian vegetation is mainly composed of speckled alder, black spruce, white cedar, Tamarack, Red-osier dogwood, Swamp thistle, and various sedges. Located on the ponds north shore, WDNR maintains a carry-in canoe launch to provide public access.

Bay Springs
Photo by Jeff Jackson, DNR

Rocky Run Creek and unnamed tributaries*

WBIC: 2404900

Rocky Run Creek, where surveyed, is a 2nd order, cool-warm headwater stream that flows into Pelican Lake on the East Fork of the Chippewa River. It is designated a Class III Trout Water by WDNR Fisheries Management. Many stretches of Rocky Run Creek are wide and deep. Its substrate is mainly silt, sand, and the occasional boulder. Its upper reaches above Bear Lake Road have seasonal flows and appear to be relatively dry during mid-summer months.

Rocky Run Creek
Photo by Jeff Jackson, DNR

Overhanging vegetation and scattered submerged macrophytes represent typical fish cover in the system. Riparian vegetation is very diverse and changes throughout the watershed. The headwaters are dominated by aspen and sugar maple stands, while mid to lower reaches are mainly Speckled alder, Canada blue joint grass, and various sedge species.

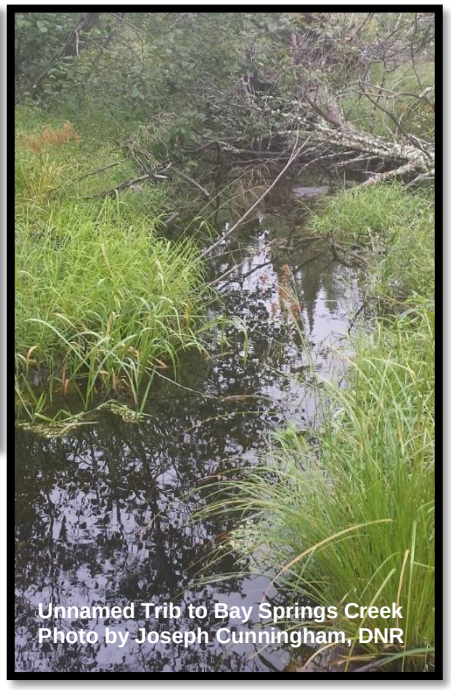
Public access to Rocky Run Creek is limited to crossings at Right of Way Road and Bear Lake Road, both located within the upper third of its watershed.

Bay Springs Creek and Unnamed Tributary to Bay Springs Creek

WBIC: 2405000

Bay Springs Creek is a 1st order cool-cold headwater stream that flows from Bay Springs to Rocky Run Creek. It is designated a Class II trout water by WDNR Fisheries Management.


Bay Springs Creek
Photo by Jeff Jackson, DNR


Unnamed Trib to Bay Springs Creek
Photo by Joseph Cunningham, DNR

The unnamed tributary to Bay Springs Creek is narrow, deep, and very stained. This small stream acts as nursery for forage fish, based on the abundance a small white suckers captured in the 2015 survey.

Bay Springs Creek is a clear, wide, shallow, sandy stream with an abundance of detritus located on the streams lateral margins. Submerged macrophytes were present but sparse at the survey site. Freshwater sponges were also present. The majority of existing fish cover was woody debris. The riparian vegetation is mainly Speckled alder, white cedar, and various sedge species.

There are no public road crossings in this remote area. Public access is limited to the canoe access launch at Bay Springs.

Unnamed Tributary to East Fork of Chippewa River*

WBIC: 2405400

This unnamed tributary to the East Fork of the Chippewa River, is a 1st order, cool-warm headwater stream. A perched culvert was observed at the Kenyon Road crossing. This culvert is affecting the waterway. Habitat and fish surveys were conducted both above and below the road culvert. Upstream the channel was wide, deep, and very silty. An insufficient number of fish were captured to determine a fish IBI score. Downstream of the culvert the channel was more defined with sandy, gravel riffles, and sandy, silty runs. This stream reach also had an abundance of fish.

Much of its watershed is dominated by closed canopy black ash and speckled alder wetlands. Its only public access is the crossing at Kenyon Road, approximately 300m upstream of the confluence with the East Fork of the Chippewa River.


Unnamed Trib to E.F. Chippewa River @ Kenyon Road. Photo by Joseph Cunningham, DNR

Unnamed Tributary to the East Fork of Chippewa River (Kenyon Spring Outlet)

WBIC: 2405500

This is a 1st order, cool-warm headwater stream that serves as the outlet to Kenyon Springs. It is designated a Class II Trout Water by WDNR Fisheries Management. The stream channel was difficult to find and consisted of numerous abandoned beaver dams that created silted intermittent pools. Its riparian areas are dominated by Canada blue joint grass and various sedge species. Public access is limited to its confluence with the East Fork of the Chippewa River and crosses no public roadways.

Muskellunge Creek*

WBIC: 2405800

Muskellunge Creek at the survey sites is a 2nd order cool-warm headwater stream that serves as the outlet to Muskellunge Lake. The survey site was a series of long sand/silty runs, with the occasional gravel riffle or bend. Beaver impacts were also observed.

Muskellunge Creek Upstream of Forest Road 167
Photo by Jeff Jackson, DNR

Generally, the stream is very stained, wide and deep, with an abundance of fish cover including; woody debris, submerged macrophytes, overhanging vegetation, and the occasional boulder. Its riparian area is dominated by Shrub-carr wetlands. Federal Forest Road 167 is the only road crossing on this stream. Public access is possible via unmaintained logging roads in the Federal Forest.

Dorns Creek*

WBIC 2407600

Dorns Creek is a 2nd order cool-warm headwater stream at the survey sites. It originates from Bullhead Lake and a serious of large wetland areas. It is designated a Class II trout water by WDNR Fisheries Management. The Dorns Creek site at Hank Bucheger Road was wide, deep, and dominated by runs and bends. The streambed consisted of silt and detritus. At this site, purple loosestrife was present at low density during the 2015 field season. This location has been listed on the WDNR Invasive Species Watch List and may require future AIS management action.

Dorns Creek Upstream of Hank Bucheger Road
Photo by Joseph Cunningham, DNR

The downstream survey site, near its confluence with the East Fork of the Chippewa River, was narrow with sandy runs, several distinct bends, and contained occasional sandy gravel riffles. Fish cover was mainly overhanging vegetation, submerged macrophytes, and the occasional boulder.
The riparian area was dominated by Canada blue joint grass, Speckled alder, and the occasional Tamarack.
Public access is limited to road crossings at Killinger Road and Hank Bucheger Road.

Kempf Springs Creek
WBIC: 2407300
Kempf Springs Creek, in the East Fork Chippewa River Watershed, is a 0.54-mile river that falls in Ashland County. This river is a Class II Trout Water under the Fisheries Program. This creek currently not considered impaired. It's only means of public access is at its confluence of the East Fork of the Chippewa River.

Sheridan Creek
WBIC: 2407500
Sheridan Creek, in the East Fork Chippewa River Watershed, is a 1.03-mile river that falls in Ashland County. This river is a Class II Trout Water under the Fisheries Program. This river currently not considered impaired. Its only means of public access is at its confluence of the East Fork of the Chippewa River.

Pelican Lake
WBIC: 2404800
Pelican Lake is a small 14.5-acre drainage lake on the East Fork of the Chippewa River. Its fish population consists of muskellunge, northern pike, walleyes, smallmouth bass, perch, rock bass, pumpkinseeds, and suckers. The near shore lake bottom types consist of mostly sand with some gravel and rock. Most of the shore vegetation is upland hardwood and conifer. Access is by water from upstream and a private access from the west. It has two cottages and Public frontage amounts to 4.72 miles of Chequamegon National Forest Land.

East Fork Chippewa River*

WBIC: 2399800
The East Fork of the Chippewa River originates in west central Iron County and meanders in southwesterly direction across Ashland County. It then empties into the Chippewa Flowage in Sawyer County. The river flows through several lakes: Sells, Pelican, and Bear Lakes in Ashland County: and Barker, Hunter, and Blaisdell Lakes in Sawyer County.

The headwaters of the river, from Iron County through Sells


East Fork of the Chippewa River at Bay Road.
Photo by Joseph Cunningham, DNR

Lake in Ashland County, are designated as Class II and III trout waters by WDNR Fisheries Management. Downstream of Sells Lake, the river is a good warm water sports fishery supporting muskellunge, walleye and bass. Based on previous surveys in the Chippewa River system, there is the potential for endangered resource occurrences in the East Fork of the Chippewa, however no inventories have been completed. The two survey sites on the East Fork of the Chippewa River had very diverse habitats. The river was wide with ample depth containing occasional riffles and pools, between long sections of runs. The streambed consisted of boulders and rubble cobble, as well as areas of shifting sand flats.

Fish cover was abundant with areas of boulder, overhanging vegetation, and submerged woody debris. The river's riparian corridor consisted of mixed upland forest and broad Silver maple floodplains. The river offers a variety of recreational opportunities including: canoeing, sport fishing, and camping. Large reaches of the river flow though the Chequamegon Nicolet National Forest. There are plenty of public access points at road crossings as well as canoe/boat launches throughout the watershed.

Muskellunge Lake

WBIC: 2405900

Muskellunge Lake is a 21-acre drainage lake entirely surrounded by a tag alder shrub swamp. It has three inlet streams, Muskellunge Creek from the northwest and an unnamed feeder from the southwest, both minnow streams and a small brook feeder stream from the northeast. Winterkill conditions and slow growing panfish are management problems. The fish populations include muskellunge, largemouth bass, perch, bluegills, black crappies, rock bass, pumpkinseeds, bullheads, white suckers, redhorse, and common shiners. This lake is currently not considered impaired.

Muskellunge Lake Feeder

WBIC: 2406000

Muskellunge Lake Feeder, in the East Fork Chippewa River Watershed, is a 1.23-mile river that falls in Ashland County. This river is a Class II Trout Water under the Fisheries Program. This river is currently not considered impaired.

Gates Lake

WBIC: 1850200

Gates Lake is a 16.86-acre seepage lake located in the East Fork Chippewa River Watershed. This small lake is landlocked and has a fish population of largemouth bass. An occasional partial winterkill and rare periods of low water levels make management of this water difficult. There is no private development as the entire lakeshore is in Chequamegon National Forest Land ownership. It is accessible by small landing on its eastside. Gates Lake is currently considered impaired for mercury.

Kenyon Springs

WBIC: 2405700

Kenyon Springs is a spring pond area with an outlet stream a half mile in length flowing into the East Fork of the Chippewa River. Two additional artificial ponds upstream from the natural ponds are licensed as a private fish hatchery (#1699). Beaver have occasionally constructed dams on these springs and, as a result, extensive siltation has taken place. There are no public access roads to this area. This springs-lake is a Class II Trout Water under the Fisheries Program. This springs-lake is currently not considered impaired.

Slim Lake

WBIC: 1881300

Slim Lake, in the East Fork Chippewa River Watershed, is a 15.07-acre lake that falls in Ashland County. This lake is currently not considered impaired. This lake is an acid, bog lake, landlocked, and surrounded by a black spruce leatherleaf bog. It is a panfish lake with a fish population consisting of perch, bullheads, and white suckers. Aquatic vegetation is scarce in this clear water, muck bottomed lake. Its wildlife value is limited to a few nesting wood ducks. Private development consists of one farm home. It does not have public frontage or an access road.

Cammerer Lake

WBIC: 1838600

Cammerer Lake, in the East Fork Chippewa River Watershed, is an 18.50-acre lake that falls in Ashland County. This lake is currently not considered impaired. This is an acid bog lake, landlocked and situated on the southwest edge of a cedar bog. The lake was chemically treated in 1959 for removal of stunted panfish. Brook trout were introduced after treatment. It is almost entirely muck bottomed. The dense growth of water shield that existed along the lake edge prior to chemical treatment with rotenone was replaced by a scattered, moderate growth of yellow water lilies after treatment. A few puddle ducks use the lake edge for nesting and furbearer use is not significant. The entire lakeshore is in Ashland County Forest Land ownership and an access is located at the south end of the lake. It has no private development.

Meyer Lake

WBIC: 1866000

Meyer Lake, in the East Fork Chippewa River Watershed, is a 13.15-acre lake in Ashland County. This lake is currently not considered impaired. Meyer Lake is an acid bog lake, landlocked, and having a fish population of bass and panfish which includes largemouth bass, perch, bluegills, black crappies, rock bass, pumpkinseeds, bullheads, and white suckers. A slow growing panfish problem exists in this infertile water. Except for possibly a few nesting puddle ducks its other wildlife value is limited. There is no private development other than a nearby fa=, and public access and public frontage is also lacking. Aquatic vegetation is sparse and lake edge vegetation is entirely tamarack, black spruce, and leatherleaf bog.

Fishtrap Lake

WBIC: 2401100

Fishtrap Lake, in the East Fork Chippewa River Watershed, is a 262.60-acre impoundment that falls in Sawyer County. This impoundment is currently considered impaired. Fishtrap Lake is a soft water, drainage lake with an outlet flow of approximately 6.5 cubic feet per second. The lake level is presently maintained by a four-foot head dam that is owned by Sawyer County. Fish population inhabiting the lake is muskellunge, walleyes, largemouth bass, perch, bluegills, pumpkinseeds, bullheads, and suckers. About one-half of the littoral shore zone is upland hardwood and conifer with a hard shoreline. Since much of the lake is shallow, an adequate supply of aquatic vegetation provides food for an abundant waterfowl, muskrat, and beaver population. There are three resorts and boat rentals, and five cottages. It has a small, poorly developed public access near the outlet. At the present time the owner of the dam is under Division of Resource Development orders to drop the level of the lake due to the unsafe conditions of the dam.

Spring Brook

WBIC: 2404300
Spring Brook, in the East Fork Chippewa River Watershed, is a 2.23-mile river that falls in Ashland County. This river is currently not considered impaired.

Zielke Lake
WBIC: 2406900
Zielke Lake, in the East Fork Chippewa River Watershed, is a 20.57-acre lake that falls in Ashland County. This lake is currently not considered impaired. Zielke Lake is a soft water, drainage lake having an outlet flow of an estimated 8.0 cubic feet per second to adjacent Gordon Lake. The two inlet feeder streams to the north are minnow streams while the lake itself has a population of muskellunge, walleye, largemouth bass, perch, black crappies, rock bass, white suckers and trout perch. The entire littoral lake bottom is hard sand and gravel. Most of the shore vegetation is tag alder - shrub swamp. Its wildlife use is limited to a few nesting puddle ducks and occasionally other migratory waterfowl. It is accessible from the town road bridge separating it from Gordon Lake and its private development consists of one cottage. There is no other public frontage on the lake other than the town road.

North Twin Lake
WBIC: 2409500
North Twin Lake, in the East Fork Chippewa River Watershed, is a 30.18-acre lake that falls in Iron County. This lake is currently not considered impaired. North Twin Lake is a very soft water seepage lake having acid, light brown water of low transparency. The outlet stream, which does not afford any boating use, is tributary to Shine Creek and part of the Tyler Forks River drainage. It is possible that the outlet may be intermittent. The entire littoral zone is composed of muck. About half of the shoreline is upland with the balance being wetland of the bog-coniferous type. Largemouth bass, perch and bluegill inhabit this lake. Waterfowl may use this area. Floating vegetation is moderate in density throughout half of the lake basin while submergent vegetation is dense. There are no developments located on the shoreline. There is no public access. Private forest crop land abutting on this lake does afford an opportunity for conditional access of the wilderness type at the present time. The lake's shallow depth suggests that winterkill may be a problem.

Seagels Lake
WBIC: 1880400
Seagels Lake, in the East Fork Chippewa River Watershed, is a 6.91-acre lake that falls in Ashland County. This lake is currently not considered impaired. Seagels Lake is an acid, bog lake, landlocked, and having a fish population of panfish. It is subject to winterkill conditions and has a slow growing fish population. A spruce - leatherleaf bog surrounds the entire lake, and the bottom type is muck. Due to the bog shoreline, wildlife value is minor. This wilderness type lake has no private development, access road, or public frontage.

Cub Lake
WBIC: 1842600
Cub Lake, in the East Fork Chippewa River Watershed, is a 31.28-acre lake that falls in Ashland County. This lake is currently not considered impaired. Cub Lake is an acid, bog and landlocked lake having a fish population of mainly panfish. Its complete fish population, however, includes muskellunge, largemouth bass, perch, bluegills, black crappies, pumpkinseeds, bullheads, and sucker. A broad margin of tamarack, spruce and leatherleaf bog surrounds eighty percent of the lake. The remaining lakeshore vegetation is Norway pine. Aquatic vegetation is sparse with yellow water lilies being the only common species. Loons and a few puddle ducks use the lake during the nesting season. Beaver are absent and

muskrat are not present in any significant numbers. It has no public frontage or access roads, and its only development is one cottage.

Torrey Lake

WBIC: 2406700

Torrey Lake, in the East Fork Chippewa River Watershed, is a 29.33-acre lake that falls in Ashland County. This lake is currently not considered impaired. Torrey Lake is an acid, bog lake having an intermittent outlet to the northeast through a hog to Gordon Lake. The fish population consists of muskellunge, largemouth bass, black crappies, bluegills, pumpkinseeds, bullheads, and white suckers. Slow growing panfish is a management problem. About ten percent of the littoral lake bottom is sand while the rest is muck bottom along the cedar and black spruce bog that surrounds most of the lake. It is accessible only by private access on the east side of the lake as there is no public frontage. Private development consists of one resort and three cottages. Waterfowl and furbearer use is minor.

Sells Lake

WBIC: 2409700

Sells Lake, in the East Fork Chippewa River Watershed, is a 14.68-acre lake that falls in Ashland County. This lake is currently not considered impaired. Sells Lake is a hard water, drainage lake on the East Fork of the Chippewa River. The normal outlet flow is estimated to be 40.0 cubic feet per second. The predominant fish population is minnows with fourteen different species represented. Fish species of minor importance are muskellunge, largemouth bass, smallmouth bass, brook and brown trout. Lakeshore vegetation varies between pastured upland of hardwoods, conifer, and grasses, to wetlands of mixed hardwoods, dogwood, willow, tag alder, and fresh meadow. About seventy-five percent of the lake bottom is sandy with the remainder gravel, rock or muck. The most common aquatic vegetation includes stands of equisetum and water celery, and beds of yellow water lily, eel grass, pondweeds and nitella. Muskrat use is significant while beaver are usually absent. Nesting waterfowl include mallards, black ducks, blue-winged teal, wood ducks, and hooded mergansers. There is a moderate amount of duck and coot use during migratory seasons. It is accessible only by private access off the town road on the north end. Private development consists of two farm homes and public frontage is lacking.

Silver Creek

WBIC: 2411700

Overview Silver Creek, in the East Fork Chippewa River Watershed, is a 4.19-mile river that falls in Ashland and Iron Counties. This river is a Class II Trout Water under the Fisheries Program. This river is currently not considered impaired.

Duck Lake

WBIC: 1845900

Duck Lake, in the East Fork Chippewa River Watershed, is a 29.68-acre lake that falls in Iron County. This lake is currently not considered impaired. Duck Lake is a very soft water seepage lake having slightly acid, light brown water of low transparency. Muck is the predominant littoral material (85 percent), with rubble (10 percent), and same gravel. Upland shoreline is predominant (85 percent) with the balance being wetland of the bog and meadow type with some conifer. Information on the fishery is lacking, however, largemouth bass and panfish may be present. Lake may receive limited use by waterfowl. At the time of survey, beaver were present. There is a sparse development of floating, emergent and submergent vegetation. There are no developments on the shoreline. There is no public access. A temperature profile on August 3, 1964 revealed a temperature range from the surface to the bottom of 79 degrees Fahrenheit to 50 degrees Fahrenheit.

Augustine Creek
WBIC: 2411600
(Overview) Augustine Creek, in the East Fork Chippewa River Watershed, is a 0.82-mile river that falls in Iron County. This river is an outstanding/exceptional resource water under NR102 as well as a Class I Trout Water under the Fisheries Program. This river is currently not considered impaired.

Summit Lake
WBIC: 2936600
Summit Lake, in the East Fork Chippewa River Watershed, is a 91.50-acre lake that falls in Ashland County. This lake is currently not considered impaired.

Hunter Lake
WBIC: 2400600
Hunter Lake, in the East Fork Chippewa River Watershed, is a 133.69-acre lake that falls in Sawyer County. This lake is currently not considered impaired. Hunter Lake is a hard water, drainage lake formed by the natural broadening of the East Fork of the Chippewa River. The normal estimated flow of the river at the lake outlet is estimated at 270 cfs. The fish population includes muskellunge, walleyes, smallmouth bass, and panfish. Muskrat are common along with a number of nesting ducks associated with the lakes adjoining 20 acres of wetlands. Stands of emergent aquatic vegetation consisting of wild rice and bulrushes provide additional habitat for waterfowl. The lakeshore vegetation is predominately hardwood and conifer upland. There is a resort and boat rental place on the lake along with eight cottages and a private camp. There is no public access road or public frontage on the lake.

Snoose Creek
WBIC: 2401800
Snoose Creek, in the East Fork Chippewa River Watershed, is a 4.41-mile river that falls in Ashland and Sawyer Counties. This river is currently not considered impaired.

Camp Fourteen Creek
WBIC: 2404100
Camp Fourteen Creek, in the East Fork Chippewa River Watershed, is a 2.22-mile river that falls in Ashland County. This river is currently not considered impaired.

Reins Creek
WBIC: 2404500
Reins Creek, in the East Fork Chippewa River Watershed, is a 1.29-mile river that falls in Ashland County. This river is a Class II Trout Water under the Fisheries Program. This river is currently not considered impaired.

Black Lake (Birch)
WBIC: 2401300
Black Lake (Birch), in the East Fork Chippewa River Watershed, is a 133.22-acre lake that falls in Ashland and Sawyer Counties. This lake is currently considered impaired. Black Lake is a soft water, drainage lake on Fish Trap Creek. There is a six-foot concrete roller dam on the lake outlet controlled by the U.S. Forest Service. The normal estimated outlet flow is 6.2 cfs. The fish population includes muskellunge, largemouth bass, and panfish. The surrounding lakeshore vegetation is upland hardwood, balsam and pine with a four-acre wetland area near the inlet, made up of fresh meadow and leatherleaf bog. Waterfowl nesting here include puddle ducks, loon, and grebes. The U.S. Forest Service owns the entire three miles of lakeshore and maintains a campground on the east side. Its facilities include boat access, picnicking and camping facilities, and a swimming beach. There is no private development on the lake.

Knickerbocker Lake
WBIC: 1868300
Knickerbocker Lake, in the East Fork Chippewa River Watershed, is a 6.75-acre lake that falls in Sawyer County. This lake is currently not considered impaired.

Snooze Lake
WBIC: 2402100
Snooze Lake, in the East Fork Chippewa River Watershed, is a 32.74-acre lake that falls in Ashland County. This lake is currently not considered impaired. Snooze Lake is a soft water, Seepage Lake having an outlet with a normal estimated flow of 0.2 cubic feet per second, flowing south into the East Fork of the Chippewa River. The outlet and the small inlet on the north end are minnow streams. A three-foot headwater control structure maintains the lake level. Its fish population consists of largemouth bass, bluegills, perch, pumpkinseeds, and minnow species. It is subject to an occasional partial winterkill. The lake's north shore has a tamarack and cedar bog shoreline while the remainder is mostly upland vegetation of birch, white pine and spruce. Waterfowl and furbearer use is minor, except for a few nesting puddle ducks. The only private development is one cottage. The lake lacks a public access road and public frontage.

Hungry Run
WBIC: 2403300
Hungry Run, in the East Fork Chippewa River Watershed, is a 9.14-mile river that falls in Ashland County. This river is currently not considered impaired.

Camp Fifteen Creek
WBIC: 2404400
Camp Fifteen Creek, in the East Fork Chippewa River Watershed, is a 2.55-mile river that falls in Ashland County. This river is a Class II Trout Water under the Fisheries Program. This river is currently not considered impaired.

Hinder Creek
WBIC: 2406400
Hinder Creek, in the East Fork Chippewa River Watershed, is a 1.55-mile river that falls in Ashland County. This river is currently not considered impaired.

Nelson Creek
WBIC: 2408200
Nelson Creek, in the East Fork Chippewa River Watershed, is a 1.93-mile river that falls in Ashland County. This river is currently not considered impaired.

Barker Lake
WBIC: 2400000
Barker Lake, in the East Fork Chippewa River Watershed, is a 212.94-acre lake that falls in Sawyer County. This lake is an outstanding /exceptional resource water and is not considered impaired. Barker Lake is a hard water, drainage lake located on the East Fork of the Chippewa River. The estimated normal outlet flow of this natural lake is 280 cfs. It has a fish population of walleyes, muskellunge, largemouth and smallmouth bass and panfish. The lakeshore bottom type varies from muck to sand and coarse gravel and rock. Extensive wetlands adjoin the lake on two small feeder streams and on Boyd Creek which flows into the lake from the southeast. Extensive use of these wetlands is made by beaver and nesting ducks and mergansers. Higher than average migratory waterfowl use is made of the lake. Much of the aquatic vegetation provides excellent waterfowl food, including wild rice. Private

development amounts to four resorts and 45 cottages. Public frontage is limited to a 60-foot platted access located at the northwest corner of the town road bridge on the upper end of the lake.

Trout Lake

WBIC: 1886700

Trout Lake, in the East Fork Chippewa River Watershed, is a 4.81-acre lake that falls in Ashland County. This lake is currently not considered impaired. Trout Lake is an acid, bog lake, landlocked and managed as a brook trout lake. It was chemically rehabilitated to remove the stunted panfish during 1958. It has subsequently had annual maintenance stocking of trout. The entire shoreline is muck bottomed bog with vegetation of tamarack, leatherleaf, and Andromeda. Waterfowl and furbearer use is insignificant except for some fall migratory waterfowl hunting. The lake has no private development and public access is by town road easement on the east shore.

Ditmans Lake

WBIC: 2407100

Ditmans Lake, in the East Fork Chippewa River Watershed, is a 2.41-acre lake that falls in Ashland County. This lake is currently not considered impaired. Ditmans Lake is an acid, bog lake having an intermittent outlet flow to Dryden Creek. It is situated in a tamarack - spruce bog and is unusual in that it has iris along the whole lake margin, next to the bog. It is entirely muck bottomed and has a fish population of only minnows, probably due to winter freeze out conditions. The lake is of little significance to wildlife. It has no public access or private development and the entire lakeshore of .25 miles is in Ashland County Forest Land. Description

Two Axe Lake

WBIC: 1887200

Two Axe Lake, in the East Fork Chippewa River Watershed, is a 45.24-acre lake that falls in Sawyer County. This lake is currently considered impaired. Two Axe Lake is a soft water seepage lake, landlocked, and subject to winter freeze-out. Naturally fluctuating water levels also occur. Its fish population at present consists of only minnows. There are 27 acres of tag alder swamp adjacent to the lake, and rooted aquatic vegetation is abundant. Beaver are present as well as a number of nesting ducks. It has no private development or access road, but its entire shoreline is in public ownership on Chequamegon National Forest lands.

Boyd Creek

WBIC: 2400300

Boyd Creek, in the East Fork Chippewa River Watershed, is a 2.08-mile river that falls in Sawyer County. This river is currently not considered impaired.

Gordon Lake

WBIC: 2406500

Gordon Lake, in the East Fork Chippewa River Watershed, is a 132.28-acre lake that falls in Ashland County. This lake is currently not considered impaired. Gordon Lake is a soft water, drainage lake on Dryden Creek. The outlet has a 1.5-foot rock roller dam structure and an estimated flow of 6.0 cubic feet per second. Besides Zielke Lake outlet and Dryden Creek, there is a small minnow stream flowing from Torrey Lake into Gordon Lake. Its most common game fish are muskellunge and walleye. Other fish species present include perch, largemouth bass, bluegills, black crappies, rock bass, pumpkinseed, bullheads, white suckers, redhorse, burbot, trout, perch and hog suckers. it has diverse shore vegetation of birch and hemlock upland, cedar bog and tag alder swamp and smaller areas of fresh meadow. Aquatic vegetation is sparse. Wildlife and waterfowl use is limited to a few migratory ducks including a

few nesting mallards and blue-winged teal. It has three resorts and boat rental places and fourteen cottages. A small-town park with swimming beach and access road is located on the northeast bay. This is the only public frontage, except for the town road that separates Zielke Lake from Gordon Lake on the north. The town road shoulder has also been used as an access upon occasion but is unimproved. Although there are bulrushes and water lilies there is a lack of aquatic vegetation necessary for proper fish cover.

Hay Creek
WBIC: 2403500
Hay Creek, in the East Fork Chippewa River Watershed, is a 5.79-mile river that falls in Ashland County. This river is currently not considered impaired.

Willerth Creek
WBIC: 2410100
Willerth Creek, in the East Fork Chippewa River Watershed, is a 5.30-mile river that falls in Ashland County. This river is a Class II Trout Water under the Fisheries Program. This river is currently not considered impaired.

Blue Gill Lake
WBIC: 1835600
Blue Gill Lake, in the East Fork Chippewa River Watershed, is a 27.45-acre lake that falls in Sawyer County. This lake is currently not considered impaired. Blue Gill Lake is a soft water seepage lake; it's landlocked and has a fish population of largemouth and smallmouth bass, and slow growing panfish. Lakeshore vegetation is mostly upland hardwood and the littoral bottom type is mainly coarse gravel and rock except along the bog bay on the southwest. Aquatic vegetation is quite space with the exception of a few emergent sedges and the floating water lilies and water shield on the lake edge. Waterfowl nesting is limited to a few mallards and wood ducks. The lake has no public access or public frontage and its private development is one cottage and a resort.

Burd Lake WBIC: 1838100
Burd Lake, in the East Fork Chippewa River Watershed, is a 14.32-acre lake that falls in Sawyer County. This lake is currently not considered impaired. Burd Lake is an acid, bog lake, landlocked with a fish population of only minnows due to winter freeze out conditions. The entire lakeshore is tamarack bog. Beaver have been active here in the past, however its present game assets are limited to a few nesting mallards. The entire lakeshore frontage of 0.74 miles is in Chequamegon National Forest ownership.

Kelp Creek WBIC: 2403900

Kelp Creek, in the East Fork Chippewa River Watershed, is a 2.04-mile river that falls in Ashland County. This river is currently not considered impaired.

Schraum Creek WBIC: 2408000
Schraum Creek, in the East Fork Chippewa River Watershed, is a 10.77-mile river that falls in Ashland County. This river is currently not considered impaired.

Augustine Lake WBIC: 2410400
Augustine Lake, in the East Fork Chippewa River Watershed, is a 171.12-acre lake that falls in Ashland County. This lake is currently not considered impaired. Augustine Lake is a soft water seepage lake with an intermittent outlet to a feeder stream of Willerth Creek. The level of the lake is partially maintained by an old beaver dam with a height of about 18 inches. The most common fish are muskellunge, bluegills, and perch. Largemouth bass, pumpkinseeds, bullheads and suckers are also present. About 30 percent of the lakeshore is bog. Littoral vegetation is sparse, probably due to its

relatively infertile and dark stained water. An occasional and unexplained summer fish-kill has occurred in the muskellunge population, the most recent being 1962. Beaver frequent the lake periodically. A small number of nesting puddle ducks may also be found here, however the lake's 250 acres of adjoining bog wetlands does not provide a great deal of suitable habitat for waterfowl. A boat livery is located on the west side and eleven cottages are scattered along the upland shores of the east and west sides. Although there are sandy stretches of beach, the shallowness and stained water detracts from the lake's desirability for swimming. A town access site is located at the south end. Ashland County Forest Land touches the bog area in the northeast corner with a total public frontage of .28 miles. The outlet stream is often intermittent and maintains a fish population of minnows.

Fishtrap Creek WBIC: 2400900
Fishtrap Creek flows through Black and Fishtrap lakes, both of which have consumption advisories for largemouth bass because of mercury (Fisheries Management files). This use impairment probably also applies to largemouth bass found in this stream.

Blaisdell Lake WBIC: 2402200

Blaisdell Lake, in the East Fork Chippewa River Watershed, is a 341.06-acre lake that falls in Sawyer County. This lake is an outstanding/exceptional resource water under NR102 under the Fisheries Program. This lake is currently not considered impaired. Blaisdell Lake is a soft water, drainage lake on the East Fork of the Chippewa River. The estimated outlet flow of this natural lake is 260 cfs. The fish population is composed of muskellunge, walleye, largemouth and smallmouth bass and panfish. There is a considerable amount of aquatic vegetation in the lake that includes patches of wild rice with other stands of bur reed, bulrushes and spike rushes. The other aquatic include water lily, water shield, pond weeds and coontail. Extensive wetlands border the lake and two unnamed minnow inhabited feeder streams enter it. The wetlands provide excellent habitat for nesting ducks, mergansers and coot. Other migratory waterfowl and muskrats are also common. There is a town road access with limited parking near the lake outlet on the north shore. Private development consists of five resorts, 18 cottages, and a boys camp. Other than the town access there is no other public frontage.

South Twin Lake WBIC: 2409400
South Twin Lake, in the East Fork Chippewa River Watershed, is a 22.36-acre lake that falls in Iron County. This lake is currently not considered impaired. South Twin Lake is a very soft water drained lake having neutral, medium brown water of low transparency. The outlet stream, McGee Creek, does not afford any boating use in the vicinity of the lake and is tributary to the East Fork of the Chippewa River (Ashland County). Sand is the predominant littoral material (50 percent), with boulders (20 percent), rubble (15 percent), and muck. Upland shoreline is predominant (95 percent) with the balance being wetland of the coniferous-bog type. Information on the fishery is lacking, however either largemouth bass or panfish or both may be present. Waterfowl are expected to make limited use of this lake. There are no developments located on the shoreline. There is no public access. Conditional access is available in that most of the lake lies within private forest cropland, thus, for the present the public is able to reach this lake

Hildebrandt Creek
WBIC: 2410500
Hildebrandt Creek, in the East Fork Chippewa River Watershed, is a 3.59-mile river that falls in Ashland County. This river is currently not considered impaired.

Kempf Springs WBIC: 2407400
Kempf Springs, in the East Fork Chippewa River Watershed, is a 2.76-acre springs-lake that falls in Ashland County. This springs-lake is a Class II Trout Water under the Fisheries Program. This springs-lake is currently not considered impaired. Kempf Springs is a spring pond area with a half-mile connecting stream to the East Fork of the Chippewa River. Outlet flow is estimated to be normally 2.5 cubic feet per second. Trout are present in the pond, actually a series of several sprawling ponds, and the stream. It is entirely muck bottomed, and a three-foot active beaver dam now impounds the springs. The surrounding vegetation is composed of mostly fresh meadow with some cedar - spruce bog and tag alder swamp. There is moderate migratory duck use, along with nesting by mallards, black ducks, and blue-winged teal. Muskrat use is not significant. This wilderness lake has no private development, access roads or public frontage.

Swanson Creek WBIC: 2402500

Overview Swanson Creek, in the East Fork Chippewa River Watershed, is a 3.60-mile river that falls in Sawyer County. This river is currently not considered impaired.

Bullhead Lake WBIC: 2407900
Bullhead Lake, in the East Fork Chippewa River Watershed, is a 13.56-acre lake that falls in Ashland County. Bullhead Lake is a big lake situated in a large tag alder and conifer swamp. The outlet is the headwaters of Dorns Creek and its estimated normal flow is 3.3 cubic feet per second. The most common fish species present are perch, bullheads, and black crappies. Low dissolved oxygen levels may occasionally cause a partial winterkill. It has no public frontage, access road or private development.

Meyers Creek

WBIC: 2408500
Meyers Creek, in the East Fork Chippewa River Watershed, is a 3.52-mile river that falls in Ashland County. This river is a Class III Trout Water under the Fisheries Program. This river is currently not considered impaired.

Bear Creek
WBIC: 2409600
Overview Bear Creek, in the East Fork Chippewa River Watershed, is a 1.74-mile river that falls in Ashland County. This river is a Class II Trout Water under the Fisheries Program. This river is currently not considered impaired.

Bear Lake
WBIC: 2403200
Bear Lake, in the East Fork Chippewa River Watershed, is a 184.13-acre lake that falls in Ashland County. This lake is currently considered impaired. Bear Lake is a soft water, natural drainage lake on the East Fork of the Chippewa River. Its outlet flow is estimated at 250 cubic feet per second. The main fish population is composed of muskellunge, walleye and perch. Species which are less abundant are smallmouth bass, bluegills, black crappies, rock bass, pumpkinseeds, bullheads, white suckers and redhorse . It has a shoreline of predominantly sand with some gravel and minor areas of rock and muck. An extensive marsh borders the old river channel bay on the north side of the lake and provides about 130 acres of sedge and grass wetlands for nesting puddle ducks and mergansers. There is also some use by muskrats. Its private development consists of a resort and boat rental and fourteen cottages. A total of 3.13 miles of public frontage on the northeast shore is in Chequamegon National Forest Land. At present it does not have a public access.

Wolf Lake WBIC: 2047000
Wolf Lake, in the East Fork Chippewa River Watershed, is a 5.43-acre lake that falls in Ashland County. This lake is currently not considered impaired. Wolf Lake is an acid, bog lake, landlocked, and surrounded by vegetation of white cedar, black spruce, bog birch, and tag alder swamp mixed with the other bog vegetation of Labrador tea, leatherleaf and sphagnum moss. It is entirely muck bottomed and aquatic vegetation is sparse. The fish population consists of perch, bluegills, and white suckers. Migratory waterfowl and duck use is minor as well as furbearer use being insignificant. It is a wilderness type lake and the entire surrounding lakeshore is in Ashland County Forest Land ownership.

Appendix C: Monitored Waters

WBIC	Waterbody Name	Station ID	Station Name	Earliest Fieldwork Date	Latest Fieldwork Date
2406900	Zielke Lake	10000592	Zielke Lake	08/29/2000	09/15/2015
2401100	Fishtrap Lake	10005609	Fishtrap Lake	08/29/2000	09/15/2015
2403200	Bear Lake	10000552	Bear Lake	10/18/1994	09/15/2015
2402200	Blaisdell Lake	10005611	Blaisdell Lake	08/29/2000	09/15/2015
1838100	Burd Lake	100141	Burd Lake	09/16/2004	09/15/2015
2409400	Twin Lakes	10002902	South Twin Lake	08/29/2000	09/15/2015
2406700	Torrey Lake	10000591	Torrey Lake	08/29/2000	09/15/2015
2406500	Gordon Lake	10000590	Gordon Lake (Ashland County)	08/29/2000	09/15/2015
2400600	Hunter Lake	10005608	Hunter Lake	08/29/2000	09/15/2015
1866000	Meyer Lake	10000572	Meyer Lake	08/29/2000	09/15/2015
1842600	Cub Lake	10000567	Cub Lake	08/29/2000	09/15/2015
1845900	Duck Lake	10002766	Duck Lake	08/29/2000	09/15/2015
1838600	Cammerer Lake	10000565	Cammerer Lake	08/29/2000	09/15/2015
2936600	Summit Lake	10000640	Summit Lake	08/29/2000	09/15/2015
2412100	Unnamed	10000595	Unnamed Lake (T42 R1E S19)	08/29/2000	09/15/2015
2400000	Barker Lake	10005606	Barker Lake	08/29/2000	09/15/2015
2407900	Bullhead Lake	10000593	Bullhead Lake	08/29/2000	09/15/2015
2004100	Kocmoud Lake	10005516	Unnamed Lake (T40 R5W S36)	08/29/2000	09/15/2015
2410400	Augustine Lake	10000551	Augustine Lake	08/29/2000	09/15/2015
1881300	Slim Lake	10000575	Slim Lake	08/29/2000	09/15/2015
1835600	Blue Gill Lake	10022211	Blue Gill Lake	09/16/2004	09/15/2015
1868300	Mud Lake	10005459	Mud Lake	08/29/2000	09/15/2015
1887200	Two Axe Lake	10005471	Two Axe Lake	08/29/2000	09/15/2015
2401300	Black Lake	10005610	Black Lake	08/29/2000	09/15/2015
1850200	Gates Lake	10000560	Gates Lake	06/22/1994	09/15/2015
2047000	Wolf Lake	10000579	Wolf Lake	08/29/2000	09/15/2015
2402100	Snoose Lake	10000587	Snoose Lake	08/29/2000	09/15/2015
2409500	Twin Lakes	10002903	North Twin Lake	08/29/2000	09/15/2015
5510425	Unnamed	10035918	Unnamed Lake	08/16/2010	08/14/2015

2399700	Lake Chippewa	10018295	Barker Lake -- Access Off Boat Landing Rd	07/27/2007	08/07/2015
WBIC	**Waterbody Name**	**Station ID**	**Station Name**	**Earliest Fieldwork Date**	**Latest Fieldwork Date**
2405900	Muskellunge Lake	10000589	Muskellunge Lake	08/29/2000	09/28/2014
2404800	Pelican Lake	10000588	Pelican Lake (Ashland Co)	08/29/2000	09/25/2013
1880400	Seagels Lake	10000574	Seagels Lake	08/29/2000	07/23/2013
2003900	Unnamed	10005514	Unnamed Lake (T40 R5W S25)	08/29/2000	09/15/2012
2021200	Unnamed	10000576	Unnamed Lake (T42 R2W S8)	08/29/2000	09/15/2012
2409700	Sells Lake	10000594	Sells Lake	08/29/2000	09/15/2012
2401700	Unnamed	10000586	Unnamed Lake (T41 R4W S30)	08/29/2000	09/15/2012
5505984	Unnamed	10035522	Unnamed Lake	06/29/2010	08/30/2012
5506009	Unnamed	10033276	Unnamed	07/05/2009	07/03/2011
2004000	Unnamed	10005515	Unnamed Lake (T40 R5W S25)	08/29/2000	07/03/2011
5509093	Unnamed	10041365	Open Water	07/03/2011	07/03/2011
2406900	Zielke Lake	10019549	Zielke Lake - Access at S End Nr Old Morse Rd	06/28/2011	06/28/2011
2405100	Bay Spring	10020232	Bay Spring - Access Nr Kenyon Rd	06/28/2011	06/28/2011
1838600	Cammerer Lake	10019544	Cammerer Lake -- Access	02/07/2007	06/22/2011
2406500	Gordon Lake	10019543	Gordon Lake - Access	06/15/2011	06/15/2011
2402200	Blaisdell Lake	10041721	Blaisdell Lake Boat Access [Temporarily Closed for Construction 2016]	12/27/2010	12/27/2010
2400500	Unnamed	10005607	Unnamed Lake (T40 R5W S28)	09/05/2000	09/26/2010
2021400	Unnamed	10036310	Unnamed Lake	07/08/2010	09/26/2010
5505666	Unnamed	100019	Unnamed - WBIC 5505666	08/19/2008	09/26/2010
1174200	Unnamed	10035232	Unnamed Lake	07/15/2010	09/26/2010
1886700	Trout Lake	10022130	Trout Lake	06/29/2007	09/26/2010
5509379	Unnamed	10035135	Unnamed Lake	09/26/2010	09/26/2010
5508308	Unnamed	10036786	Unnamed Lake	09/26/2010	09/26/2010
5581761	Unnamed	10035883	Unnamed Lake	08/16/2010	09/01/2010
2401100	Fishtrap Lake	10018070	Fishtrap Lake -- Access Off Log Lodge Rd	07/30/2010	07/30/2010

WBIC	Waterbody Name	Station ID	Station Name	Earliest Fieldwork Date	Latest Fieldwork Date
2410400	Augustine Lake	10019545	Augustine Lake -- Access	07/14/2008	07/15/2010
2003300	Unnamed	100983	Unnamed	08/10/2008	08/10/2008
2406500	Gordon Lake	023123	Gordon Lake - Southeast Basin	04/13/2000	08/09/2000
2406500	Gordon Lake	023122	Gordon Lake - North Basin	04/13/2000	08/09/2000
2401100	Fishtrap Lake	584007	Fishtrap Lake - Fishtrap Lake	08/01/1979	08/01/1979
2400000	Barker Lake	584002	Barker Lake - Barker Lake	07/21/1979	07/21/1979
1842600	Cub Lake	024003	Cub Lake	07/17/1979	07/17/1979

Joseph Cunningham, DNR during streams monitoring project on Rocky Run Creek

Appendix D: Watershed Report[i]

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Impair-mints	Sources	Assess-mint	Impaired Status
2410600	Augustine Creek	0	1.88	Cold (Class II Trout)	Cold (Class II Trout)	Fully Supporting	NA	NA	Monitored	NA
2411600	Augustine Creek	0	0.82	Cold (Class I Trout)	Cold (Class I Trout)	Not Assessed	NA	NA	No Assessment	NA
2410600	Augustine Creek	1.88	9.59	Cold (Class I Trout)	Cold (Class I Trout)	Fully Supporting	NA	NA	Monitored	NA
2410400	Augustine Lake	0	166	Shallow Seepage	FAL	Supporting	NA	NA	Monitored	NA
2400000	Barker Lake	0	212.95	Shallow Lowland	FAL	Supporting	NA	NA	Monitored	NA
2405000	Bay Spring Creek	0	0.27	Cold (Class II Trout)	Cold (Class II Trout)	Fully Supporting	NA	NA	Monitored	NA
2405100	Bay Springs	0	1.17	Small	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2409600	Bear Creek	0	1.74	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2403200	Bear Lake	0	184.14	Shallow Lowland	FAL	Supporting	NA	NA	Monitored	303d Listed
2401300	Black Lake (Birch)	0	129	Shallow Lowland	FAL	Supporting	NA	NA	Monitored	303d Listed
2402200	Blaisdell Lake	0	341.07	Shallow Lowland	FAL	Supporting	NA	NA	Monitored	NA
1835600	Blue Gill Lake (Bass)	0	26	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA
2400300	Boyd Creek	0	2	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2407900	Bullhead Lake	0	14	Deep Headwater	FAL	Supporting	NA	NA	Monitored	NA
1838100	Burd Lake	0	14	Shallow Seepage	FAL	Supporting	NA	NA	Monitored	NA
1838600	Cammerer Lake	0	19	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA
2404400	Camp Fifteen Creek	0	2.55	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2404100	Camp Fourteen Creek	0	2	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
1842600	Cub Lake	0	31	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA
2407100	Ditmans Lake	0	2.41	Small	FAL	Not Assessed	NA	NA	No Assessment	NA

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Impairments	Sources	Assessment	Impaired Status
2407600	Dorns Creek	0	0.86	Cold (Class II Trout)	Cold (Class II Trout)	Supporting	NA	NA	Monitored	NA
2407600	Dorns Creek	0.86	3.56	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2407600	Dorns Creek	3.56	6.8	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2407600	Dorns Creek	6.8	7.29	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2406200	Dryden Creek	0	10.82	FAL	FAL	Not Assessed	NA	NA	Evaluated: Watershed Tables	NA
2406200	Dryden Creek	10.82	16.41	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
1845900	Duck Lake	0	32	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA
2410900	East Branch Augustine Creek	0	0.82	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2410900	East Branch Augustine Creek	0.82	2.65	Class III Trout	FAL	Not Assessed	NA	NA	Evaluated: Watershed Tables	NA
2399800	East Fork Chippewa River	0	1.33	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2399800	East Fork Chippewa River	0	2.67	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2399800	East Fork Chippewa River	3.53	4.37	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2399800	East Fork Chippewa River	5.47	10.92	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2399800	East Fork Chippewa River	13.57	32.42	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2399800	East Fork Chippewa River	32.43	32.82	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2399800	East Fork Chippewa River	32.83	52.23	FAL	FAL	Fully Supporting	NA	NA	Monitored	NA
2399800	East Fork Chippewa River	52.22	63.5	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2399800	East Fork Chippewa River	63.5	74.07	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Impairments	Sources	Assessment	Impaired Status
2399800	East Fork Chippewa River	74.07	74.45	Class III Trout	FAL	Not Assessed	NA	NA	No Assessment	NA
2399800	East Fork Chippewa River	74.46	83.61	Class III Trout	FAL	Fully Supporting	NA	NA	Monitored	NA
2400900	Fishtrap Creek	0	11	WWFF	FAL	Not Assessed	NA	NA	No Assessment	NA
2401100	Fishtrap Lake	0	216	Shallow Lowland	FAL	Supporting	NA	NA	Monitored	303d Listed
1850200	Gates Lake	0	22	Deep Seepage	FAL	Not Assessed	NA	NA	Monitored	303d Listed
2406500	Gordon Lake	0	142	Deep Lowland	FAL	Supporting	NA	NA	Monitored	NA
2403500	Hay Creek	0	6	FAL	FAL	Supporting	NA	NA	Monitored	NA
2410500	Hildebrandt Creek	0	4	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2406400	Hinder Creek	0	2	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2403300	Hungry Run	0	9	WWFF	FAL	Not Assessed	NA	NA	Evaluated: Watershed Tables	NA
2400600	Hunter Lake	0	126	Shallow Lowland	FAL	Supporting	NA	NA	Monitored	NA
2403900	Kelp Creek	0	2	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2407400	Kempf Springs	0	2.76	Small	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2407300	Kempf Springs Creek1	0	0.54	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2405500	Kenyon Spring Creek2	0	0.68	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2405700	Kenyon Springs3	0	1.98	Small	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
1868300	Knickerbocker Lake	0	14	Small	FAL	Supporting	NA	NA	Monitored	NA
5003494	Local Water	0	0.78	FAL	FAL	Not Assessed	NA	NA	Not Assessed	NA
5003270	Local Water	0	0.24	FAL	FAL	Not Assessed	NA	NA	Not Assessed	NA
2409000	Local Water	0	1.33	FAL	FAL	Supporting	NA	NA	Monitored	NA
2412500	Local Water	0	2.2	FAL	FAL	Supporting	NA	NA	Monitored	NA

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Impairments	Sources	Assessment	Impaired Status
2406800	Local Water	0	1.94	FAL	FAL	Fully Supporting	NA	NA	Monitored	NA
2405400	Local Water	0	1.21	FAL	FAL	Fully Supporting	NA	NA	Monitored	NA
2405200	Local Water	0	3.63	FAL	FAL	Supporting	NA	NA	Monitored	NA
2408700	Magee Creek	0	12.56	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2408700	Magee Creek	12.56	15.81	Class III Trout	FAL	Fully Supporting	NA	NA	Monitored	NA
1866000	Meyer Lake	0	14	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA
2408500	Meyers Creek	0	3.52	Class III Trout	FAL	Not Assessed	NA	NA	No Assessment	NA
2405800	Muskellunge Creek	0	5	FAL	FAL	Fully Supporting	NA	NA	Monitored	NA
2405900	Muskellunge Lake	0	22	Shallow Lowland	FAL	Supporting	NA	NA	Monitored	NA
2406000	Muskellunge Lake Feeder	0	1.23	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2408200	Nelson Creek	0	2	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2409500	North Twin Lake	0	30.18	Shallow Seepage	FAL	Supporting	NA	NA	Monitored	NA
2404800	Pelican Lake	0	14.55	Deep Lowland	FAL	Supporting	NA	NA	Monitored	NA
2404500	Reins Creek	0	1.29	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2404900	Rocky Run	0	4.88	Class III Trout	FAL	Supporting	NA	NA	Monitored	NA
2408000	Schraum Creek	0	11	WWFF	FAL	Not Assessed	NA	NA	Evaluated: Watershed Tables	NA
1880400	Seagels Lake	0	6.91	Small	FAL	Supporting	NA	NA	Monitored	NA
2409700	Sells Lake	0	16	Shallow Lowland	FAL	Supporting	NA	NA	Monitored	NA
2407500	Sheridan Creek	0	1.03	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2411700	Silver Creek	0	4.19	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
1881300	Slim Lake	0	15	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Impairments	Sources	Assessment	Impaired Status
2401800	Snoose Creek	0	5	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2402100	Snooze Lake (Snooze)	0	24	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA
2404300	Spring Brook	0	2	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2936600	Summit Lake	0	91.5	Shallow Seepage	FAL	Supporting	NA	NA	Monitored	NA
2402500	Swanson Creek	0	3	FAL	FAL	Not Assessed	NA	NA	No Assessment	NA
2406700	Torrey Lake	0	30	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA
1886700	Trout Lake	0	4.81	Small	FAL	Not Assessed	NA	NA	No Assessment	NA
2409400	Twin Lake, South	0	26	Shallow Headwater	FAL	Supporting	NA	NA	Monitored	NA
1887200	Two Axe Lake	0	45.24	Deep Seepage	FAL	Supporting	NA	NA	Monitored	303d Listed
2004100	Un Lake	0	22.02	Deep Seepage	FAL	Supporting	NA	NA	Monitored	NA
2410100	Willerth Creek	0	5.3	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	NA	NA	No Assessment	NA
2047000	Wolf Lake	0	5.43	Small	FAL	Supporting	NA	NA	Monitored	NA
2406900	Zielke Lake	0	21	Reservoir	FAL	Supporting	NA	NA	Monitored	NA

[i] The watershed assessment table reflects the condition of waters in the study area watershed. This table data is stored in the Water Assessment Tracking and Electronic Reporting System (WATERS) and is updated on an ongoing basis via monitoring data and assessment calculations. The following definitions apply:

- Current Use – current condition of water based on monitoring data.
- Attainable Use – "ecological potential" of water based on water type, natural community, lack of human-induced disturbances.
- Supporting Attainable Use – decision on whether the water's current condition is supporting its designated use under "water quality standards".
- Designated Use – the water's classified use under NR102, Wisconsin Water Quality Standards, for Fish and Aquatic Life.
- Impairments – documented impacts on water condition due to pollution sources or changes in hydro-geomorphological changes.
- Assessment – field indicates what type of data or information supports the decisions in the table (current, attainable, and supporting attainable).
- Impaired Water Status – This column indicates the status of the impaired water for TMDL development.