



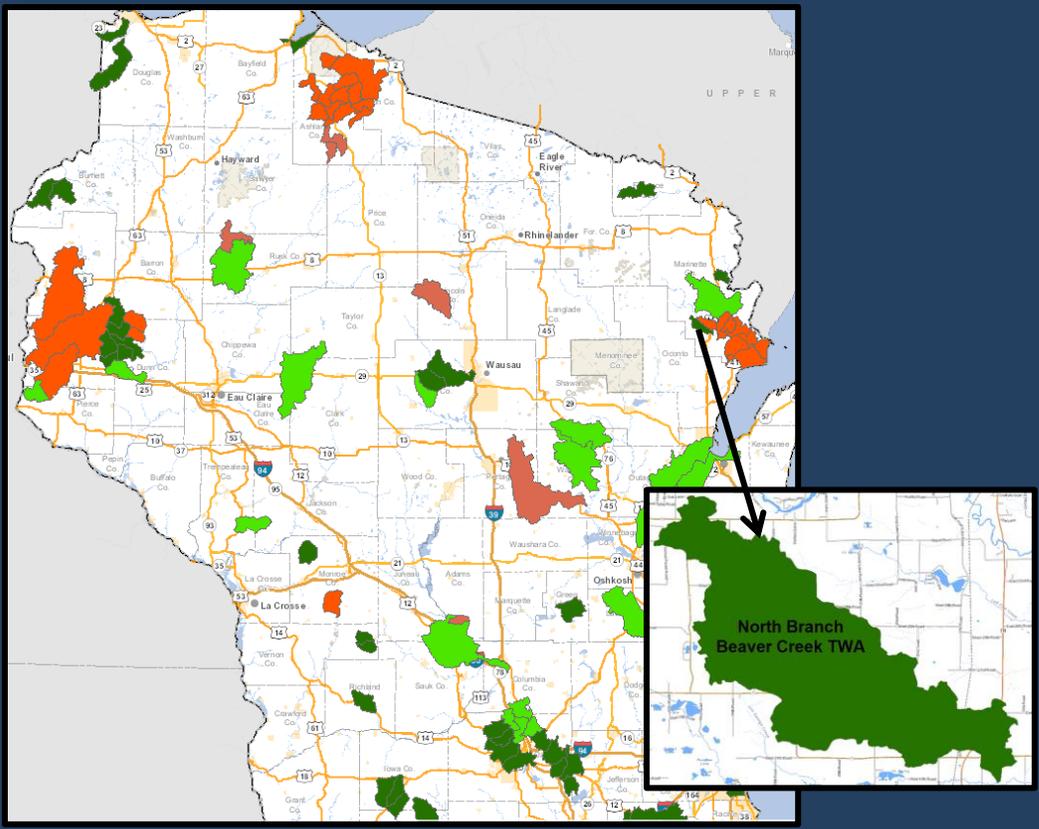
North Branch Beaver Creek  
Photo by Andy Hudak, DNR

2014/06/30

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

# NORTH BRANCH BEAVER CREEK TWA WQM PLAN 2017

*Little Peshtigo River (GB08)  
HUC: 040301050503, Monitored in 2014*



EGAD # 3200-2017-22  
Water Quality Bureau,  
Wisconsin DNR

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## List of 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.

**FBI: 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.** WDNR'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.

## Watershed Discussion & Management Recommendations

### Watershed Goals

The overall goal of this plan is to improve and protect water quality in the basin. This Targeted Watershed Assessment monitoring project provided substantial data to analyze current conditions and to make recommendations for future management actions in the area. This plan is designed to present monitoring study results, identify issues or concerns in the area found during the project and to make recommendations to improve or protect water quality consistent with Clean Water Act guidelines and state water quality standards.

### Watershed Overview

The North Branch of Beaver Creek is an 11.86 mile long tributary to the Peshtigo River located within the Little Peshtigo River watershed in southern Marinette County.

The North Branch Beaver Creek sub-watershed is 20.8 square miles in size and supports mainly cool to cold water streams.

The North Branch Beaver Creek is an excellent brown and brook trout stream with hard, clear, and slightly alkaline water conducive to high productivity. Walker Creek, and a smaller unnamed headwater stream, comprise the surrounding waters capable of supporting trout and mottled sculpin. These waters are designated Outstanding Resource Waters (see Outstanding Waters, NR 102 Wisconsin Adm. Code). No waterways are currently known to be impaired in the subwatershed. Currently, there are no permitted wastewater dischargers in the area;

however, one concentrated animal feeding operation (CAFO) is located just north of, and outside of, the watershed boundary.

Land use in the North Branch Beaver Creek sub-watershed is primarily forested wetlands with some agricultural production along the southern and northern borders of the watershed. The land use along the creek's riparian corridor is largely conifer wetlands comprised of white cedar. Like most of southern Marinette County, historical logging practices followed by fire and subsequent agricultural development have led to what are called "legacy impacts" on area streams. These include susceptibility to erosion, hydrologic modification, and an elevated level of turbidity compared to what may have existed prior to human induced landscape change.

Conservation work to protect the stream dates back to the 1950's when the

first project to fence the stream (to reduce streambank erosion from trampling banks by livestock) occurred. Since that time, the state has acquired significant land ownership within the watershed, which has reduced degradation of stream quality due to land uses in stream corridors.

The headwaters of the North Branch of Beaver Creek are of special importance. Williston Springs, the origin of Beaver Creek, is joined downstream by a series of spring seeps along the banks of the river to form the headwaters.

### Land Use

North Branch Beaver Creek is located in the Little Peshtigo River watershed which is 158.43 mi<sup>2</sup>. Land use in the watershed is primarily agricultural (45%), wetland (25%) and a mix of forest (21%) and other uses (9%) (Figure 2). This watershed has 206.41 stream miles, 2,168.89 lake acres and 24,619.22 wetland acres.



Figure 1: North Branch Beaver Creek watershed.

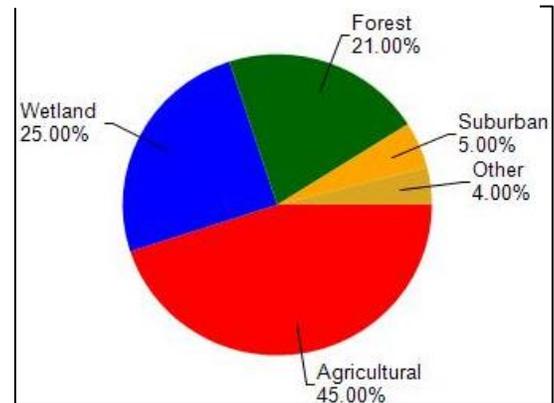


Figure 2: Land use in the Little Peshtigo River.

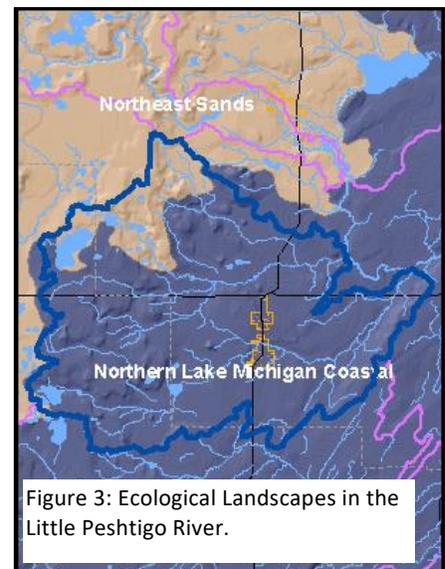


Figure 3: Ecological Landscapes in the Little Peshtigo River.

## Ecological Landscapes

The Little Peshtigo River Watershed is primarily located within the Northern Lake Michigan Coastal Ecological Landscape in northeastern Wisconsin and includes Green Bay and the northern part of the Door Peninsula. Local landforms consist of the Niagara Escarpment, a prominent dolomite outcrop along the east side of Green Bay, a lacustrine plain along the west side of Green Bay, and ground moraine in nearby land features. Cliffs, sinkholes, and dolomite ledges are associated with the Niagara Escarpment.

Soils in the area are diverse; in some areas, lacustrine sands are found overlying clays or bedrock within only a few feet of the surface. In the Door Peninsula, soils are typically stony loamy sands to loams. Poorly drained sands are common in the lake plain or in depressions between dunes and beach ridges.

On the western side of Green Bay, ground moraine is composed of moderately well drained, rocky, sandy loams, interspersed with lacustrine sands and clays, with peat and muck also common.

Historic vegetation included maple-basswood-beech forest, hemlock-hardwood forest, northern white cedar swamp, hardwood-conifer swamp, wet meadows, and coastal marshes. Conifer dominated upland forests that resemble boreal forest were once present along Lake Michigan; they contain a significant component of white spruce and balsam fir.

Current vegetation consists of more than 60% non-forested land, most of which is in agricultural crops, with smaller amounts of grassland, wetland, shrubland, and urbanized areas. Forested lands are dominated by maple-basswood, with smaller amounts of lowland hardwoods, aspen-birch, and lowland conifers. High quality areas of exposed alkaline bedrock beach occur on the northern Door Peninsula, providing habitat for many rare plants. Several islands lie off the Door Peninsula and these also provide critical habitat for rare species and colonially nesting birds.

## Study Summary

The North Branch of Beaver Creek is an 11.86 mile long tributary to the Peshtigo River within the Little Peshtigo River watershed in southern Marinette County. The North Branch Beaver Creek sub-watershed is 20.8 square miles with mainly cool to cold water streams. The North Branch Beaver Creek is an excellent brown and brook trout stream with hard, clear, and slightly alkaline waters conducive to high productivity. Nearby Walker Creek and smaller unnamed headwater streams comprise waters all capable of supporting trout and mottled sculpin; these are all classified as Outstanding Resource Waters. There are no waters listed as impaired under the Clean Water Act in the sub-watershed.

## Management Recommendations

- DNR should work with the county and local partners to identify protection measures for sensitive waters in the watershed (i.e. North Branch, Walker Creek, and unnamed tributaries).
- DNR should update the Master Plan for the North Branch Beaver Creek State Fishery Area, which was last updated in 1980 (Figure 4).
- Marinette County Conservation Department and/or other county staff should apply for runoff and river grants to identify and fund specific resource actions that would further protect and restore the high quality waters of the North Beaver Creek Subwatershed area.

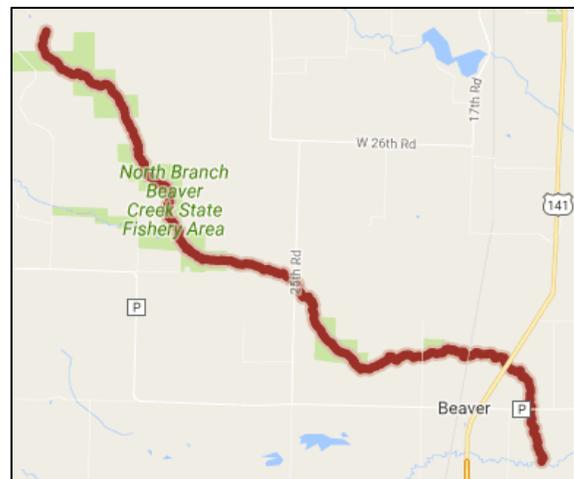


Figure 4: North Beaver Creek, Marinette County, Wisconsin.

## 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. The ORW and ERW designation is reserved for waters that the State of Wisconsin has determined warrant additional protection from the effects of pollution.

Table 1: Outstanding and Exceptional Resource Waters in the Little Peshtigo River Watershed (GB08).

Waterbody Name	WBIC	ORW/ERW	Start Mile	End Mile
Iron Springs Creek	521700	ERW	0	5
McDonald Creek	519900	ERW	0	9.45
Messenger Creek	518400	ERW	3.57	7.34
Murphy Creek	522100	ERW	1.44	5.78
North Branch Beaver Creek	520400	ORW	0	2.8
North Branch Beaver Creek	520400	ORW	2.8	11.86
South Branch Beaver Creek	521000	ERW	7.66	16.88
Creek 11-8	524400	ERW	0	1.57
Creek 3-2 T31n R19e	520925	ORW	0	0.65
Brooks Creek	521800	ERW	N/A	N/A
Walker Creek	520700	ORW	0	3

### Trout Waters

DNR uses three categories to classify the different types of trout streams throughout Wisconsin. Efforts have been made to list all trout streams in the State of Wisconsin, but it is recognized that this listing is not exhaustive. Trout waters in this watershed are listed in Table 2. High quality trout waters (Class I) that 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. Therefore, 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.

Table 2: Listed trout waters in the Little Peshtigo River watershed (GB08).

Waterbody Name	WBIC	Start Mile	End Mile	Trout Class
Bass Creek	521300	0	1.28	CLASS II
Beaver Creek	520100	0	4	CLASS III
Brooks Creek	521800	N/A	N/A	CLASS I
Creek 11-8	524400	0	1.57	CLASS I
Creek 3-2 T31n R19e	520925	0	0.65	CLASS I
Creek 34-12	520950	0	0.41	CLASS I
Iron Springs Creek	521700	0	5	CLASS I
Jones Creek	518000	0	2	CLASS II
McDonald Creek	519900	0	9.45	CLASS I
Messenger Creek	518400	0	1.05	CLASS I
Messenger Creek	518400	1.06	3.57	CLASS II
Messenger Creek	518400	3.57	7.34	CLASS I
Murphy Creek	522100	0	1.14	CLASS II

Murphy Creek	522100	1.44	5.78	CLASS I
Murphy Creek	522100	6.13	6.15	CLASS I
North Branch Beaver Creek	520400	0	2.8	CLASS II
North Branch Beaver Creek	520400	2.8	11.86	CLASS I
School Creek	518100	0	2.19	CLASS II
South Branch Beaver Creek	521000	0	7.66	CLASS II
South Branch Beaver Creek	521000	7.66	16.88	CLASS I
Walker Creek	520700	0	3	CLASS I
Whiskey Creek	523600	0	6.62	CLASS II

### 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. Impaired waters in this watershed are impaired for historical discharges, mine tailings, and runoff issues (Table 3).

Table 3: Waters in the Little Peshtigo River Watershed (GB08) that were listed as impaired but are now delisted.

Name	WBIC	Acres	Pollutant	Impairment	Sources	303 Status
Bass Lake	521400	7.31	Total Phosphorus	Eutrophication	NA	Delisted
Bass Lake	521400	7.31	Mercury	Contaminated Fish Tissue	NA	Delisted
Gilas Lake	523300	135	Mercury	Contaminated Fish Tissue	Atm. Dep.	Delisted

## Monitoring Project Discussion

### Purpose of Project

The purpose of this study was to conduct evaluation monitoring, which can be used to identify potential stressors on the health of aquatic systems through chemistry, physical or biological monitoring, or to create additional background information for bioassessment criteria development and related work. The study also involved overall baseline condition data in the larger subwatershed.

### Site Selection and Study Design

The study sites were selected so to reduce bias for a specific type of stream order, location, or natural community; however, sites may have been targeted based on ease of access and the need to update information due to limited or outdated data for a particular stream reach. Data collection stations were established to limit outside influences and to enable staff to use DNR field procedures that require 35 times the mean stream width (Modified from Simonson, et al. 1994) for fish and habitat parameters. Stations were established to ensure that no less than the minimum of 100 meters -- and no more than the maximum of 400 meters -- were sampled.

Table 4: Waters and stations sampled in the North Branch Beaver Creek TWA.

Water body Name	WBIC	Station ID	Location	Stream Order
North Branch Beaver Creek	520400	10013181	Upstream CTH P	4
North Branch Beaver Creek	520400	10022047	Downstream 21st Road	4
Walker Creek	520700	10038311	Downstream 37th Road	3
North Branch Beaver Creek	520400	10042822	Public Access Lands 37th Road	2
Walker Creek	520700	383168	Downstream 33rd Road	3
North Branch Beaver Creek	520400	10042655	Upstream Walker Creek Confluence	3
Unnamed Tributary to Beaver Creek	520800	10042956	Upstream confluence with North Branch Beaver Creek	1
North Branch Beaver Creek	520400	10013177	Downstream of 25th Road	4

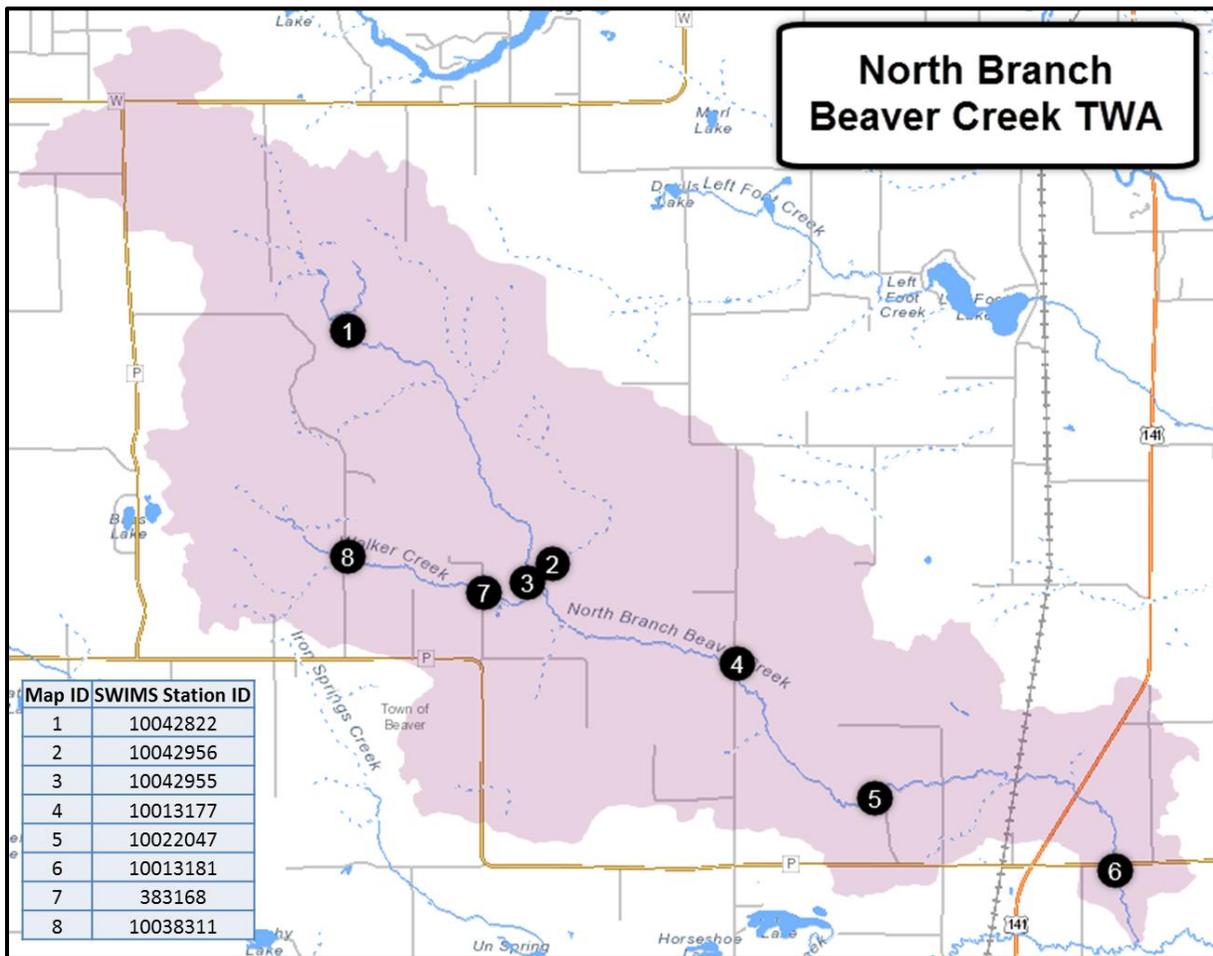


Figure 5: Map of the monitoring stations for the North Branch Beaver Creek TWA.

### Methods, Equipment and Quality Assurance

In this study water quality monitoring was conducted at eight wadeable sites throughout the watershed during the spring, summer, and fall of 2014. During each field visit basic water quality parameters including air temperature, water temperature, conductivity, dissolved oxygen, dissolved oxygen percent, pH, flow, and water clarity were collected (Figure 5). Total phosphorous samples were collected by citizen volunteers once per month throughout the growing season from May through October. A continuous temperature (HOBO instrument) was installed on the stream and continuous water temperature readings were collected between May and October.

### Continuous Water Temperature Monitoring

An Onset Hobo water temperature data logger was placed within the sample station used for fish and habitat survey at the station nearest the pour point upstream of CTH P. Temperature readings were collected every 15 minutes from May thru October. Temperature data will be used to determine relative thermal regimes for the sample station and to ascertain average daily summer time maximum temperatures.

### Fish Surveys

Fish surveys were completed through the identified sample station. A direct current electrofishing backpack shocker or tow behind stream shocker was used to collect all fish possible through an upstream pass through the sample station. Typically the back pack units were used on the small streams up to 3 meters with a single probe and the stream shockers were used with a generator and 2 probes on the remainder of sites over 3 meters. All fish were collected, identified, and counted. All gamefish

were measured. All other DNR sampling protocols were used to assess the fish community for purposes of calculating the index of biotic integrity.

### Habitat Surveys

At the established pour point station, a quantitative habitat evaluation was completed. A total of 12 transects were located equidistant throughout the station to sample representative available habitat. Quantitative habitat metrics were collected such as average stream width and depths, depths of fines, substrate, embeddedness of substrate, macrophyte or algal growth, canopy cover, riparian buffers, land use, stream bank erosion, and fish cover. The station length was established at a distance 35 times the mean stream width. The remaining stations had qualitative habitat assessment completed which utilize a condensed protocol to obtain the same habitat metrics as if complete quantitative habitat protocols were used.

### Macroinvertebrate Sampling

Macroinvertebrate samples were obtained by kick sampling a collection using a D-frame net at all 8 sites in the watershed in fall. These samples were sent to the University of Wisconsin-Stevens Point for taxonomic classification, analysis, and computation of a Macroinvertebrate Index of Biological Integrity (M-IBI) and other metrics.

### Project Results

Results of the fisheries surveys are summarized in Table 5. The Wisconsin Stream Natural Community Model results (Lyons, 2008) indicate that the streams in the North Branch of Beaver Creek are a mix of Cool-Warm Headwater, Cool-Warm Mainstem, Cool-Cold Headwater, and Coldwater streams. Utilizing the natural community verification draft guidance (Lyons, 2013), based on the fish assemblages observed, seven of eight streams monitored do not fit the respective modeled natural community. All stream sites, with the exception of the North Branch of Beaver Creek at CTH P, exhibited a “best fit” for thermal and size guild matched with coldwater streams. The stream reach at North Branch Beaver Creek at CTH P fits a Cool-Cold Headwater; however, this station is the furthest downstream segment and the flows observed do not fit a headwater stream. As such, the small stream/intermittent FIBI metric not an appropriate tool and should not be applied to this section the stream. The next most logical assumption is that the North Branch Beaver Creek is best evaluated as a coldwater stream.

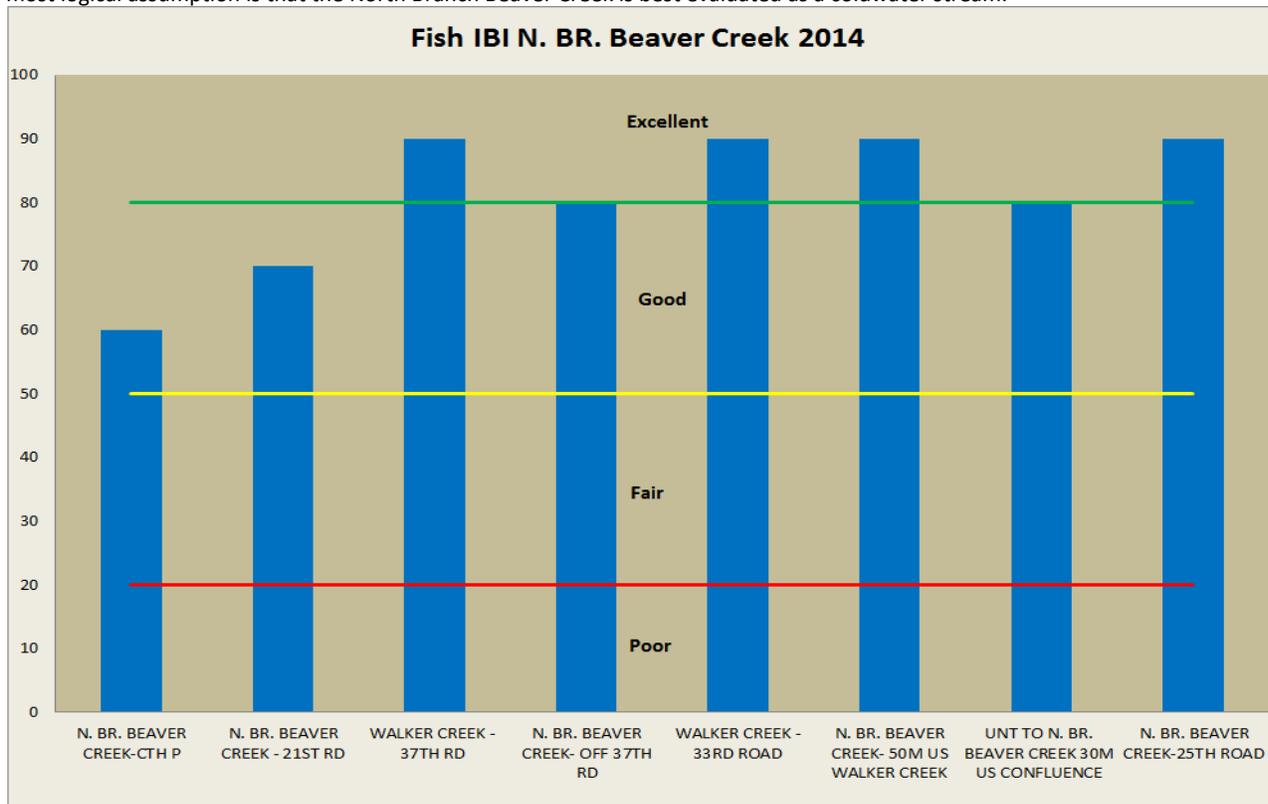


Figure 6: Fish IBI scores for North Branch Beaver Creek Watershed Survey 2014.

Macroinvertebrate samples were collected at all sites and evaluated with the Hilsenhoff Biotic indices (HBI) (Hilsenhoff, 1987), Family level Biotic Indices (FBI) (Hilsenhoff 1988) and the Macroinvertebrate Index of Biotic Integrity (MIBI) (Weigel, 2003). Results were fairly consistent among sites sampled – all sites rated as good to excellent (Table 6).

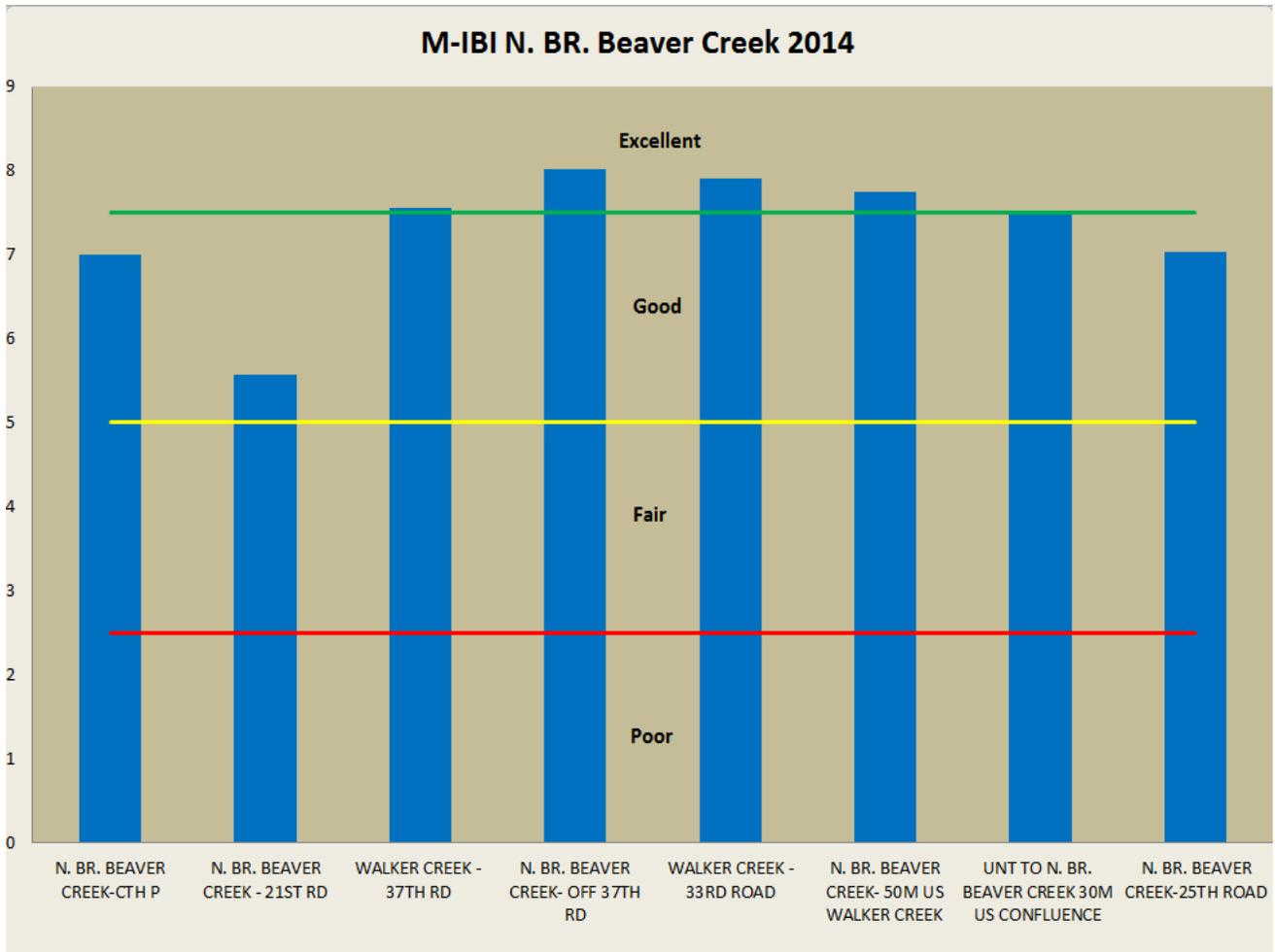


Figure 7: MIBI values for selected streams and stations in the North Branch Beaver Creek Watershed Survey 2014.

During the monthly growing season total phosphorous samples were collected from the furthest downstream pour point on the North Branch of Beaver Creek at CTH P. The results indicated that the state standards for total phosphorous were met and that total phosphorous concentrations were in 2014 below levels that would result in impairments within the stream (Figure 8).

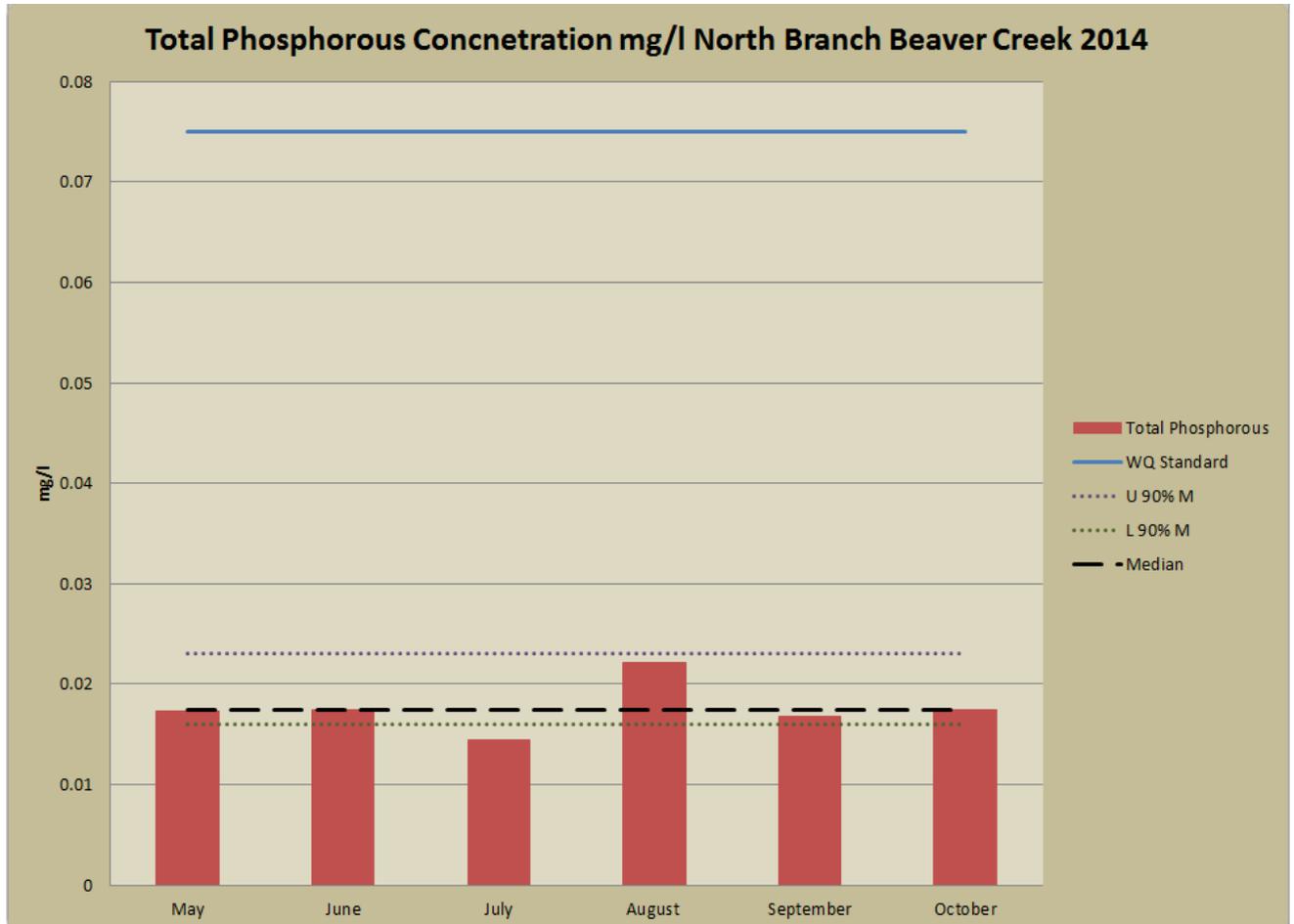


Figure 8: Total Phosphorous Monitoring Results North Branch Beaver Creek at CTH P 2014

### **Current Assessment Period**

In addition to the results from the 2014 study, the North Branch Beaver Creek was assessed for phosphorus and biological data (fish and macroinvertebrates) during the 2018 listing cycle. New biological (macroinvertebrate Index of Biotic Integrity (MIBI) scores) sample data were clearly below 2018 WisCALM listing thresholds (i.e., the water is in good condition) for the Fish and Aquatic Life use. This water is meeting this designated use and is not considered impaired.

Table 5: Fisheries Surveys and Index of Biotic Integrity Scores in the North Branch Beaver Creek Watershed 2014

2014 Stream - Site	North Branch Beaver Creek US CTH P	North Branch Beaver Creek DS 21st Road	Walker Creek DS 37th Road	North Branch Beaver Creek Public Access Land 37th Road	Walker Creek Downstream 33rd Road	North Branch Beaver Creek US Walker Creek Confluence	UNT to North Branch Beaver Creek US Confluence North Branch Beaver Creek	North Branch Beaver Creek DS 25th Road
	<b>Stream Order</b>	4	4	3	2	3	3	1
<b>Mean Stream Width</b>	5	5	3	5	3	4	3	5
<b>Station Length</b>	175	175	100	170	100	140	100	175
<b>Modeled Natural Community</b>	CWMS	CWMS	CCHW	CCHW	CW	CWHW	CWHW	CWMS
<b>Verified Natural Community</b>	CW	CW	CW	CW	CW	CW	CW	CW
<b>Fish Species</b>								
Western Blacknose Dace	5							1
White Sucker	3					1		
Mottled Sculpin	27	43	18	46	12	49	30	25
Creek Chub	2							
Longnose Dace	3							
Central Mudminnow	5	7				1	4	1
Burbot	1	1						13
Brook Stickleback	1							
Lamprey (Ammocoete)	1		1					2
Brook Trout	7	12	34	19	23	29	7	20
Brown Trout	13	9	43	6	25	15		23
Green Sunfish								1
<b>Total # of Fish</b>	<b>68</b>	<b>72</b>	<b>96</b>	<b>71</b>	<b>60</b>	<b>95</b>	<b>41</b>	<b>86</b>
<b>Total # Species</b>	<b>11</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>8</b>
<b>IBI Score</b>								
Coldwater	G (60)	G (70)	E (90)	G (80)	E (90)	E (90)	G (80)	E (90)
Coolwater (CC)	-	-	-	-	-	-	-	-
Coolwater (CW)	G (80)	G (60)	-	-	-	-	-	G (60)
Warmwater	-	-	-	-	-	-	-	-
Small Stream	-	-	F (40)	F (40)	-	F (40)	F (40)	-
<b>Habitat Score</b>								
<b>Small Stream &lt; 10 m</b>	F (40)	G (68)	E (77)	G (68)	E (77)	E (85)	F (43)	E (77)

CWMS= Cool-Warm Mainstem

CWHW= Cool-Warm Headwater

CCMS= Cool-Cold Mainstem

CCHW= Cool-Cold Headwater

W- Warmwater

CW= Coldwater

E= Excellent

G= Good

F= Fair

P= Poor

Green value represents fish IBI value based on the verified natural community

Table 6: Macroinvertebrate ratings in the North Branch Beaver Creek TWA in 2014

2014	North Branch Beaver Creek US CTH P	North Branch Beaver Creek DS 21st Road	Walker Creek DS 37th Road	North Branch Beaver Creek Public Access Land 37th Road	Walker Creek Downstream 33rd Road	North Branch Beaver Creek US Walker Creek Confluence	UNT to North Branch Beaver Creek US Confluence North Branch Beaver Creek	North Branch Beaver Creek DS 25th Road
Stream - Site								
<b>Stream Order</b>	4	4	3	2	3	3	1	4
<b>Mean Stream Width</b>	5	5	3	5	3	4	3	5
<b>Station Length</b>	175	175	100	170	100	140	100	175
<b>Modeled Natural Community</b>	CWMS	CWMS	CCHW	CCHW	CW	CWHW	CWHW	CWMS
<b>Verified Natural Community</b>	CW	CW	CW	CW	CW	CW	CW	CW
<b>HBI Rating<sup>1</sup></b>	3.03	3.61	3.33	3.34	2.71	3.49	5.39	4.29
<b>HBI Score<sup>1</sup></b>	E	VG	E	E	E	E	G	VG
<b>FBI Rating<sup>1</sup></b>	3.5	3.88	3.51	4.19	3.34	4.04	5.01	4.19
<b>FBI Score<sup>1</sup></b>	E	VG	VG	VG	E	VG	VG	VG
<b>MIBI Rating<sup>2</sup></b>	G	G	E	E	E	E	E	G
<b>MIBI Score<sup>2</sup></b>	7	5.57	7.55	8.02	7.9	7.74	7.52	7.03

E= Excellent (0-3.5)

VG= Very Good (3.51-4.50)

G= Good (4.51-5.50)

F= Fair (5.51-6.50)

F= Fairly Poor (6.51-7.50)

P= Poor (7.51-8.50)

E= Excellent (7.5-10)

G= Good (5.0- 7.49)

F= Fair (2.51- 4.99)

P= Poor (0- 2.5)

## Discussion

The North Branch Beaver Creek Watershed is generally rated as good-to-excellent water quality based on biology, habitat, and water chemistry results. In the mid 1950's researchers identified this watershed as a unique, outstanding trout fishing resource that requires protection and improvement through management actions. However, "legacy impacts" from logging and agriculture have caused irreversible change to the stream.

"Legacy impacts" in this area resulted from clear cut logging ridges, woodlands and swamps in the late 1800's and extensive erosion caused significant sedimentation to occur into the valley floors and waterways. Following logging, land use in close proximity to stream corridors primarily consisted of grazing, and as such these water quality condition issues related to grazing and related activities have been identified and, in some cases, corrected through conservation practices. Even with the "legacy impacts" still affecting underlying conditions today, the North Branch of Beaver Creek, Walker Creek, and unnamed tributaries are thriving and in good condition. Based on current land use, recreation, and likely development in the future, the most pressing threats to water quality in the watershed include logging, rural development, aquatic invasive species, and loss of water / baseflow from the installation of high capacity wells in the area.

The forestry industry is substantial in Wisconsin for both state and county managed forests and also private land ownership. To prevent significant impacts to streams within the watershed, all forestry activities should strictly follow Wisconsin's Forestry Best Management Practices for Water Quality Field Manual. This manual should be used by loggers, landowners and land managers to plan and implement forestry best management practices to prevent degradation of the water resources in the watershed. Of special importance is the protection and preservation of the coniferous forested wetlands throughout the immediate stream corridor. Special silviculture practices for this forest type should be employed to ensure the preservation and regeneration of this forest type.

Wisconsin's strong outdoor heritage leads to continual pressure from rural development in the form of seasonal cabins or secondary homes. Proper site planning and best management practices during construction for erosion control should be the standard. Highly erodible areas near stream banks, steep slopes, and springs should be avoided to prevent additional sedimentation downstream into the waterways and wetlands.

Aquatic invasive species are a continual threat to Wisconsin's vast water resources. Of special concern, is the recently discovered New Zealand Mud Snail in a cold-water trout stream near Madison. While the New Zealand Mud Snail has not been discovered in other trout stream throughout the state, it is likely an easy to spread species. The likely vector for movement is fisherman. New Zealand mud Snails are prevalent out west and it is hypothesized that the Mud Snails were transported on waders or other equipment used by fisherman. Since the North Branch of Beaver Creek and Walker Creek are excellent trout fisheries, fisherman and other users should always prevent the spread of aquatic invasive species by cleaning and disinfecting gear between streams.

The local geology of the region and desire to maximize production on agricultural fields has increased demand for the installation and use of center pivot irrigation. Currently there are 4 operating center pivot high capacity wells located within the boundary of the watershed and an additional 10 located just to the north outside of the watershed. It currently does not appear that these wells are having any measurable impact to the flow or thermal regime to the streams in the watershed. Thorough evaluation of future proposed high capacity wells should ensure no impacts to the North Branch Beaver Creek, Walker Creek, their unnamed tributaries, or any springs will occur.

## Management Actions

### Management Goals

- Practice and follow all forestry best management practices in the watershed.
- Proper site planning for new homes to avoid erodible slopes, steep slopes, and springs.
- Continue education for AIS spread prevention at popular fishing access locations.
- Ensure proper evaluation of high capacity wells in order to make certain that siting does not impact springs or small tributaries that contribute base flow to Walker and N.B Beaver Creeks.
- Enhance fishing opportunities through maintenance of sand traps in the lower portion of the watershed, limit alder brush clearing, and initiate trout habitat projects to maintain high quality fishing opportunities and access.

### Monitoring and Assessment Recommendations

Natural communities near stream stations in this subwatershed should be changed from the modeled natural communities to a coldwater community. The stream segments/station sites that require changing to a coldwater natural community include:

- North Branch Beaver Creek US CTH P
- North Branch Beaver Creek DS 21st Road
- Walker Creek DS 37th Road
- North Branch Beaver Creek Public Access Land 37th Road
- Walker Creek Downstream 33rd Road
- North Branch Beaver Creek US Walker Creek Confluence
- UNT to North Branch Beaver Creek US Confluence North Branch Beaver Creek
- North Branch Beaver Creek Downstream 25th Road

### Management Recommendations for DNR

- Promote the use of forestry best management practices in the watershed.
- Ensure proper evaluation of high capacity wells so as to not impact springs or small tributaries that contribute base flow to Walker and North Branch Beaver Creek.

### Management Recommendations for External Partners

- Educate interested watershed partners on aquatic invasive species prevention, especially at popular fishing access locations.
- Maintain sand traps in the lower portion of the watershed and limit alder brush clearer to enhance fishing opportunities.



Walker Creek  
Photo by Andy Hudak, DNR

2014/06/30

## Appendix A: References

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## Appendix B: Stream Narratives

### North Branch Beaver Creek

The North Branch of Beaver Creek is an excellent resource in Marinette County with good to excellent biology and other water quality characteristics. Continuous water temperature readings indicate cold water temperatures are maintained throughout the summer months. Water Chemistry results would suggest dissolved oxygen levels remains stable and nutrient concentrations meet state standards. The riparian corridor and buffer condition is in excellent conditions throughout the entire stream reach from the headwaters to the confluence with Beaver Creek. The corridor consists mainly of wooded coniferous swamps and tag alder thickets that provide excellent woody debris recruitment to the stream and shade that helps to maintain cold summer water temperatures.

A large portion of this corridor is under public ownership and protected. Legacy impacts from past logging and agricultural are observed with the large extensive deposit of sand throughout the entire stream from headwaters to confluence. These extensive fines have the ability to easily cover rock riffles, fill in undercut banks, and bury log jam structures. In the mid 1980's extensive artificial bank cover structures were installed to provide habitat and angling opportunities. These bank covers have been maintained as recently as the early 2010's. A sand trap was excavated below 21<sup>st</sup> street to attempt to capture sands washed downstream from the removal of a large perched culvert upstream. It was noted by Department staff that this trap was completely filled after a minimal storm event. This trap was excavated only once and will likely be abandoned as an active management proposal in 2016/2017 for habitat improvements and angler access is constructed. Habitat availability and quality will continue to be a concern from the extensive sand deposits within the system for years to come.

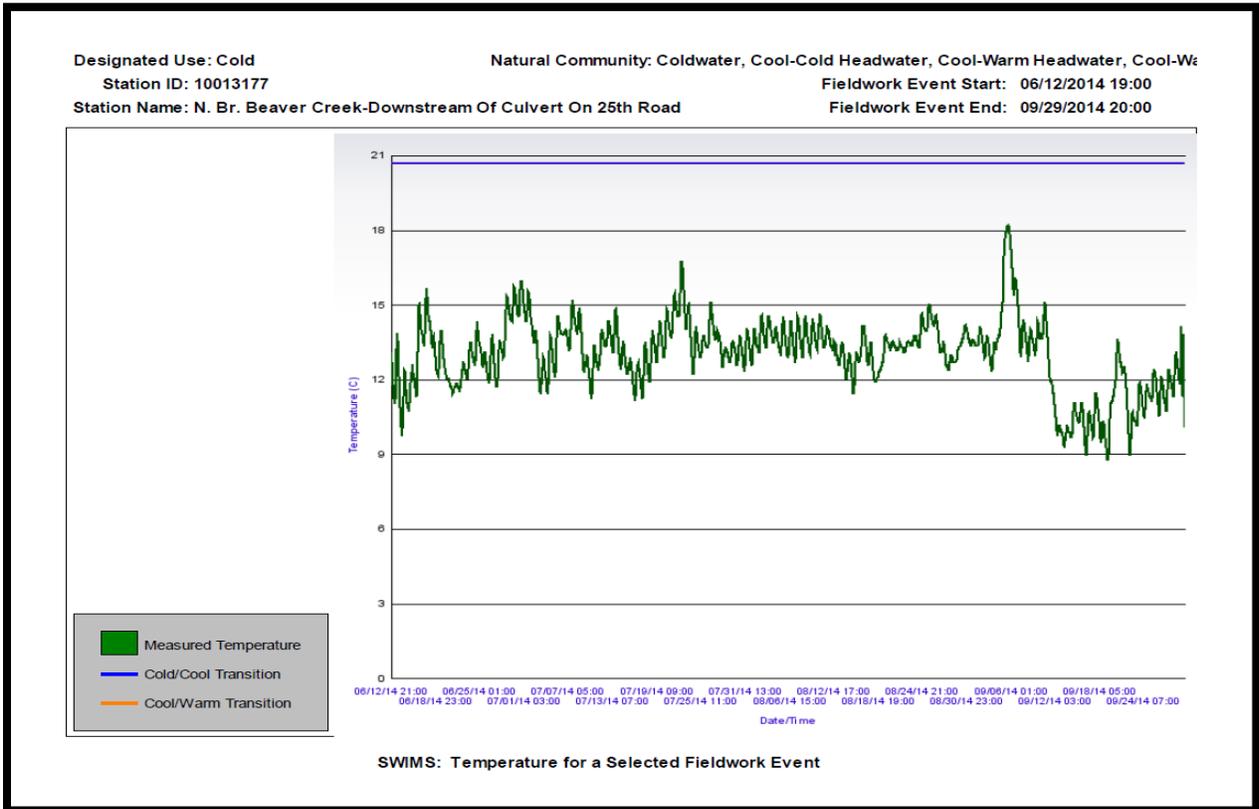
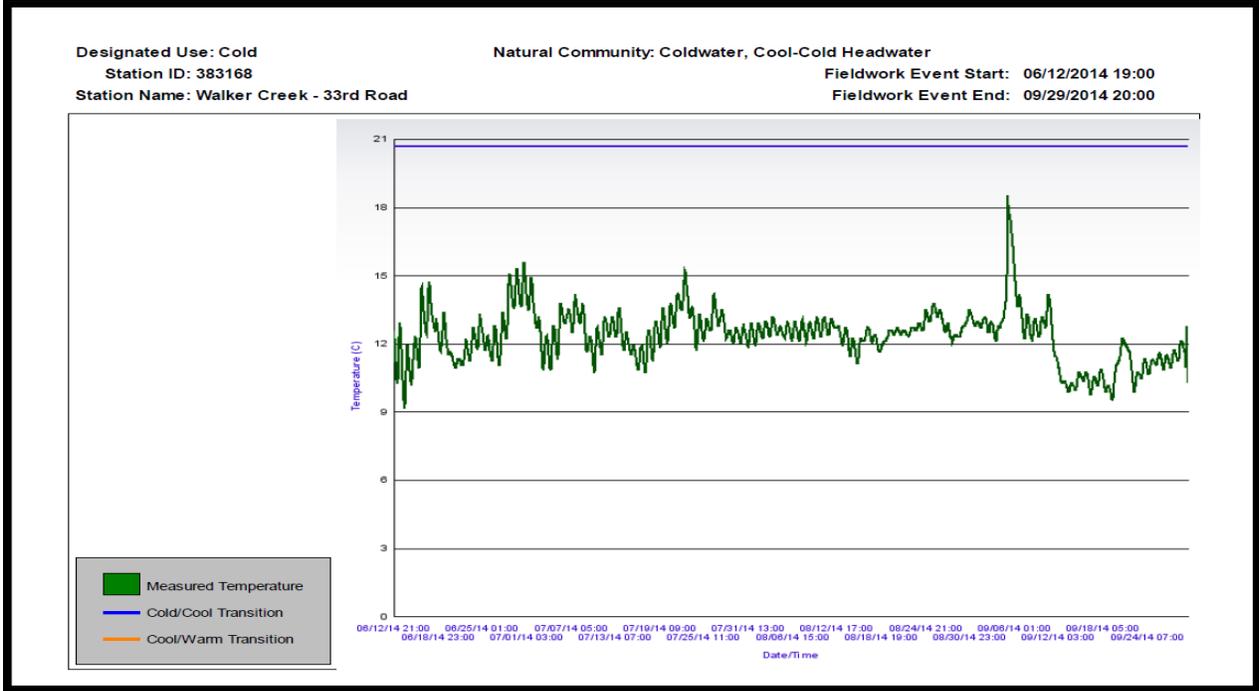
### Walker Creek

Walker Creek is 3 mile Coldwater tributary to the North Branch of Beaver Creek. It has excellent biology and habitat. Continuous water temperature readings indicate cold water temperatures are maintained throughout the summer months. The riparian corridor is in excellent condition and the stream is well buffered as it flows throughout mostly coniferous swamps and northern hardwood and coniferous woods. Public ownership throughout the stream corridor will ensure protection of this valuable resource into the future. Walker Creek is limited by its lack of deep pools and amount of fines. Legacy impacts from logging and agriculture are apparent; however, the stream habitat still remains in excellent condition. To help improve conditions further and help limit sand depositional movement downstream into the North Branch of Beaver Creek, a sand trap was installed above 33<sup>rd</sup> road. This trap has only been cleaned once since its installation in 2010.

### Unnamed Tributary to Beaver Creek

The unnamed tributary to the North Branch of Beaver Creek just upstream of the confluence of Walker Creek and the North Branch of Beaver Creek is a small cold-water tributary. This stream had good biology with fair habitat. This tributary is flow and habitat limited. Extensive fins are a concern that has impacted the stream by increasing the width to depth ratio, covering coarse substrate, and filling in pools. Limited flow in this tributary has and continued to prevent these fines from transporting downstream and exposing coarse substrate and cutting new pools. However, with habitat being limited in this tributary, the importance for continual cold water base flow to the North Branch of Beaver Creek cannot be overlooked.

### Appendix C: Temperature Graphs

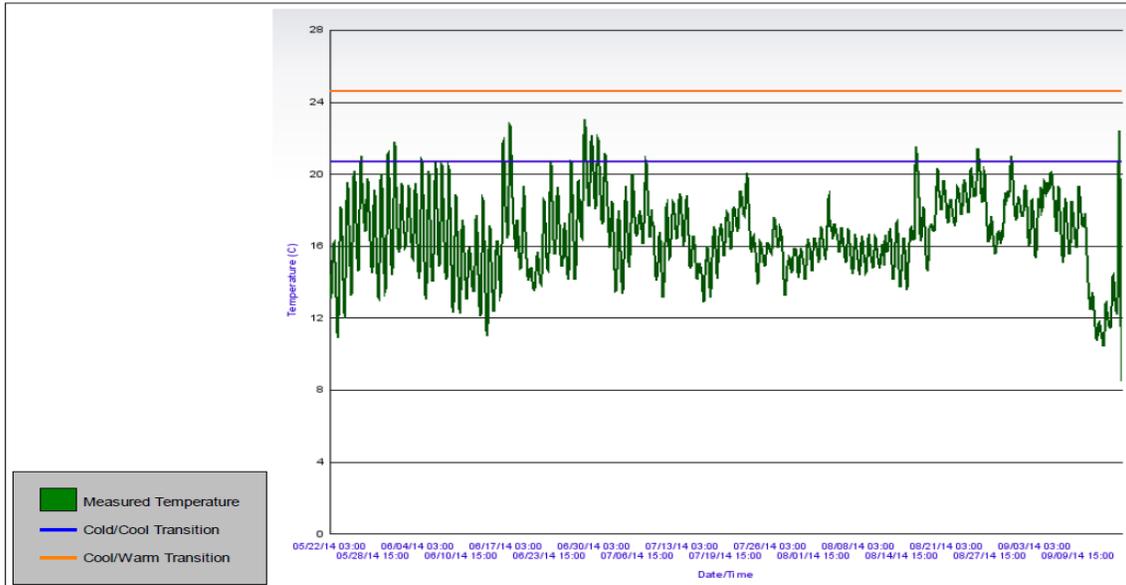


Designated Use: Cold  
Station ID: 383169

Natural Community: Cool-Warm Mainstem

Fieldwork Event Start: 05/22/2014 01:00  
Fieldwork Event End: 09/16/2014 01:00

Station Name: Beaver Cr N Branch - Hwy P



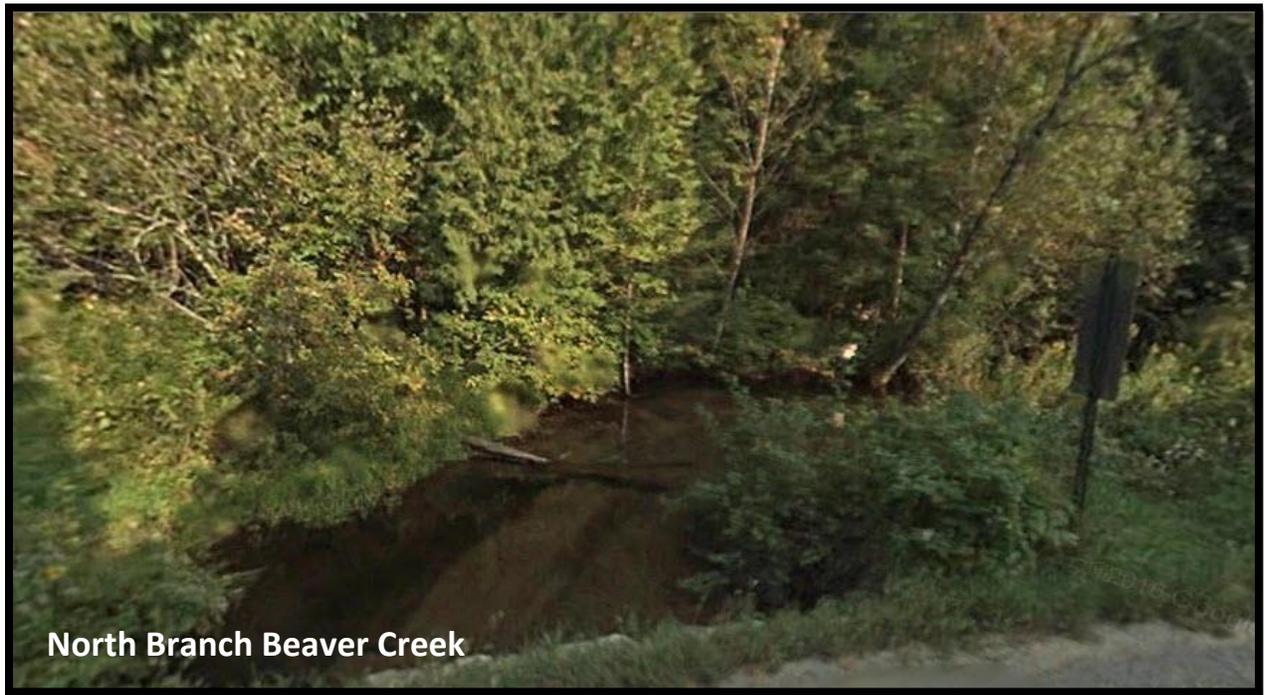
SWIMS: Temperature for a Selected Fieldwork Event

## Appendix D: Monitored Waters

WBIC	Waterbody	Station	Station Name	Earliest Fieldwork	Latest Fieldwork
5590016, 520700	Unnamed, Walker Creek	10048244	North Branch Beaver Creek Fishery Area WBIC 5590016	04/12/2017	04/12/2017
519500	Leigh Flowage	433365	Leigh Flowage - Marl Bay Deep Spot	05/16/2001	02/24/2017
504300	Rost Lake	433061	Rost Lake - Deepest Part	01/20/1976	02/24/2017
519700	Underwood Lake	10044054	Underwood Lake - Staff Gage	08/24/2015	11/16/2016
519900	McDonald Creek	10039611	McDonald Creek-Kapalin Ln.	06/12/2012	10/26/2016
518400	Messenger Creek	10039613	Messenger Creek-Lee Lake Rd.	06/12/2012	10/26/2016
521000	South Branch Beaver Creek	383047	South Branch Beaver Creek At Sth 64 [Site 6 2006]	10/24/1979	10/26/2016
520100	Beaver Creek	10042470	Beaver Creek - 3rd Rd	01/01/2015	10/26/2016
519500	Leigh Flowage	433207	Lee Lake - Deepest Part	01/20/1976	10/03/2016
523300	Gilas Lake	383100	Gilas Lake - Deep Hole	08/22/2001	08/22/2016
523300	Gilas Lake	10003670	Gilas Lake	04/14/1994	08/04/2016
519700	Underwood Lake	433040	Underwood Lake - Deepest Part	01/20/1976	08/01/2016
504300	Rost Lake	10001413	Rost Lake	07/27/1999	07/21/2016
517400	Little Peshtigo River	383032	Little Peshtigo River at Cth W	10/11/2000	10/14/2015
521400	Bass Lake	383209	Bass Lake - Deep Hole	04/15/1986	09/06/2015
506000	Unnamed	10003714	Unnamed Lake (T31 R19E S21)	07/27/1999	08/01/2015
515100	White Potato Lake	10004133	White Potato Lake	07/01/1998	08/01/2015
519000	First Lake	10001414	First Lake	07/27/1999	08/01/2015
519700	Underwood Lake	10001417	Underwood Lake	07/27/1999	08/01/2015
519200	Jocko Lake	10001415	Jocko Lake	07/27/1999	08/01/2015
522300	Unnamed	10003726	Unnamed Lake (T31 R19E S35)	07/27/1999	08/01/2015
523000	Nelligan Lake	10003730	Nelligan Lake	07/27/1999	08/01/2015
518300	Montana Lake	10003724	Montana Lake	07/27/1999	08/01/2015
522400	Murphy Lake	10003727	Murphy Lake	07/27/1999	08/01/2015
503100	Newbar Lake	10003701	Newbar Lake	07/27/1999	08/01/2015
519500	Leigh Flowage	10045496	Phragmites Occurrence - Leigh Flowage	07/15/2015	08/01/2015
521000	South Branch Beaver Creek	10044227	S Branch of Beaver River at Tom Post Rd S of Section 8 Church Rd.	07/29/2015	07/29/2015
523300	Gilas Lake	10019661	Gilas Lake -- Access at Dnr - N Side Of Lk	07/29/2010	07/25/2015
523500	Perch Lake	10001418	Perch Lake	07/27/1999	07/15/2015
426500	Reader Lake	10004211	Reader Lake	07/27/1999	07/15/2015
518200	Jones Lake	10003723	Jones Lake	07/27/1999	07/15/2015
522800	House Lake	10003729	House Lake	07/27/1999	07/15/2015
519500	Leigh Flowage	10001416	Leigh Flowage	07/27/1999	07/01/2015
519900	McDonald Creek	10039615	McDonald Creek-Parkway Rd.	06/12/2012	05/20/2015
518000	Jones Creek	383161	Jones Creek - W 12th Road	04/07/1993	01/01/2015
520400	North Branch Beaver Creek	383169	Beaver Cr N Branch - Hwy P	04/13/1993	01/01/2015
520400	North Branch Beaver Creek	10042955	North Branch Beaver Creek 10m US UNT; 50m US Walker Creek	08/20/2014	10/06/2014
520800	Unnamed	10042956	UNT to North Branch Beaver Creek 30m US from Confluence	08/20/2014	10/06/2014
520700	Walker Creek	383168	Walker Creek - 33rd Road	04/07/1993	09/29/2014

WBIC	Waterbody	Station	Station Name	Earliest Fieldwork	Latest Fieldwork
520400	North Branch Beaver Creek	10042822	North Branch Beaver Creek at public access lot off 37th Rd	07/30/2014	09/29/2014
520400	North Branch Beaver Creek	10013177	N. Br. Beaver Creek-Downstream Of Culvert On 25th Road	08/06/2004	09/29/2014
520700	Walker Creek	10038311	Walker Creek - 37th Rd downstream	06/30/2014	09/29/2014
521400	Bass Lake	10003725	Bass Lake (Marinette County)	07/27/1999	09/23/2014
524000	Unnamed	10001419	Unnamed Lake (T31 R18E S36)	07/27/1999	09/23/2014
523100	Little Nelligan Lake	10003731	Little Nelligan Lake	07/27/1999	09/23/2014
498500	Bass Lake	10003677	Bass Lake	07/27/1999	09/23/2014
505900	Unnamed	10003713	Unnamed Lake (T31 R19E S21)	07/27/1999	09/23/2014
5532480	Second Lake	101298	Second Lake	08/28/2008	09/23/2014
522600	Marsh Lake	10003728	Marsh Lake	07/27/1999	09/23/2014
422000	Holt Lake	10004188	Holt Lake	07/27/1999	09/23/2014
498300	Bahlert Lake	10003675	Bahlert Lake	07/27/1999	09/23/2014
520400	North Branch Beaver Creek	10013181	N. Br. Beaver Creek-Upstream Of Cth P To Highway 141	04/13/1993	09/16/2014
520400	North Branch Beaver Creek	10022047	North Branch Beaver Creek 21st Rd	07/09/2014	09/16/2014
502800	Mattrich Lake	10003699	Mattrich Lake	07/27/1999	09/14/2014
518300	Montana Lake	10018977	Montana Lake -- Access at Fishery Area 12th Rd	07/23/2010	08/03/2014
515100	White Potato Lake	10018947	White Potato Lake -- Access Nr White Potato Lake Rd	08/03/2014	08/03/2014
519500	Leigh Flowage	10018962	Leigh Lake -- Access	07/20/2014	07/20/2014
515100	White Potato Lake	10018945	White Potato Lake -- Access Nr Parkway Rd	07/25/2004	07/04/2014
515100	White Potato Lake	10018943	White Potato Lake -- Access at The End Of Pike Rd	07/12/2008	06/20/2014
515100	White Potato Lake	10018946	White Potato Lake -- Access Nr White Potato Lake Rd	07/04/2013	06/13/2014
518400	Messenger Creek	10039614	Messenger Creek-Parkway Rd.	06/12/2012	06/13/2014
500500	Giese Lake	10003688	Giese Lake	07/27/1999	09/27/2013
505500	Unnamed	10003712	Unnamed Lake (T31 R19E S9)	07/27/1999	09/11/2013
504300	Rost Lake	10018963	Rost Lake -- Access	07/14/2013	07/14/2013
517400	Little Peshtigo River	383049	Little Peshtigo River at Business Ush 141 Coleman	10/22/1985	10/26/2012
517400	Little Peshtigo River	10037810	Little Peshtigo River Upstream of Coleman WWTF	07/17/2012	10/18/2012
501300	Horseshoe Lake	10003693	Horseshoe Lake	07/27/1999	09/01/2012
521400	Bass Lake	383074	Bass Lake - Deepest Part	07/20/1975	05/23/2012
521400	Bass Lake	383229	Bass Lake Tributary - Bass Lake Tributary	05/09/1995	05/23/2012
515100	White Potato Lake	433343	White Potato Lake - Deep Hole	05/27/1999	02/23/2012
523600	Whisky Creek	383165	Whisky Creek - 47th Rd. bridge	04/07/1993	09/08/2011
515100	White Potato Lake	10034893	White Potato Lake -- Walker Bay	06/17/2011	06/17/2011
523000	Nelligan Lake	383262	Nelligan Lake - Deep Hole	10/10/1988	05/30/2011
517400	Little Peshtigo River	10032291	Downstream 46ft from Coleman WWTP outfall	12/05/2010	12/05/2010

WBIC	Waterbody	Station	Station Name	Earliest Fieldwork	Latest Fieldwork
517400	Little Peshtigo River	10032292	Little Peshtigo River US 46 ft from Coleman WWTP outfall	12/05/2010	12/05/2010
517500, 5530484	Unnamed, Unnamed	10036317	Unnamed - Area of Open Water	06/24/2010	09/12/2010
522400	Murphy Lake	10019827	Murphy Lake -- Access at E Side Of Lake	07/29/2010	07/29/2010
523000	Nelligan Lake	10018740	Nelligan Lake -- Access Nr W 18th Rd	07/29/2010	07/29/2010
521400	Bass Lake	10018979	Bass Lake -- Access at The End Of 10th Rd	10/20/1992	07/29/2010
501100	Heisel Lake	10003692	Heisel Lake	07/27/1999	07/26/2010
518400	Messenger Creek	433311	Messenger Creek - Hwy B	04/14/1993	09/30/2009
519900	McDonald Creek	10015716	McDonald Creek At Rost Lake Road [Site 9 2006]	07/08/2009	09/30/2009
519100	Second Lake	10032803	Second Lake	08/24/2009	09/09/2009
517400	Little Peshtigo River	10028956	Little Peshtigo River at Cth B	09/08/2008	09/08/2008
521500	Un Spring	101233	Unnamed - WBIC 521500	08/03/2007	08/28/2008
517400	Little Peshtigo River	383163	Little Peshtigo River - 23 Road	04/07/1993	09/30/2007
520400	North Branch Beaver Creek	10021387	North Branch Beaver Creek Off Of 20th Rd	08/20/2007	09/24/2007
521900	Brooks Lake	100784	Brooks Lake	08/03/2007	08/03/2007



North Branch Beaver Creek

Appendix E: Watershed Report<sup>i</sup>

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Designated Use	Impairments	Sources	Assessment	Impaired Water Status
498300	Bahlert Lake	0	8.37	Small	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
521300	Bass Creek	0	1.39	FAL	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
521300	Bass Creek	0	1.28	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	Cold	NA	NA	No Assessment	NA
498500	Bass Lake	0	7.31	Small	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
521400	Bass Lake	0	40.34	Deep Headwater	WWSF	Fully Supporting	Default FAL	Eutrophication	NA	Monitored	Water Delisted
520100	Beaver Creek	0	4	Class III Trout	FAL	Fully Supporting	Default FAL	NA	NA	No Assessment	NA
521800	Brooks Creek	0	0.09	Cold (Class I Trout)	Cold (Class I Trout)	Not Assessed	Cold	NA	NA	No Assessment	NA
521900	Brooks Lake	0	2.56	Small	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
519000	First Lake	0	7.47	Small	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
500500	Geise Lake (Mud)	0	25	Shallow Seepage	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
523300	Gilas Lake	0	135	Deep Seepage	FAL	Fully Supporting	Default FAL	NA	NA	Monitored	Water Delisted
501100	Heisel Lake	0	8.55	Small	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
422000	Holt Lake	0	6.2	Small	FAL	Supporting	Default FAL	NA	NA	Monitored	NA

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Designated Use	Impairments	Sources	Assessment	Impaired Water Status
501300	Horseshoe Lake	0	15	Deep Seepage	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
522800	House Lake	0	6.81	Small	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
521700	Iron Springs Creek	0	1.75	Cold (Class I Trout)	Cold (Class I Trout)	Not Assessed	Cold	NA	NA	No Assessment on File	NA
521700	Iron Springs Creek	0	5	Cold (Class I Trout)	Cold (Class I Trout)	Not Assessed	Cold	NA	NA	No Assessment on File	NA
519200	Jocko Lake	0	17.68	Deep Lowland	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
518000	Jones Creek	0	2	Cold (Class II Trout)	Cold (Class II Trout)	Fully Supporting	Cold	NA	NA	Monitored	NA
518200	Jones Lake	0	39	Shallow Headwater	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
519500	Leigh Flowage (Lee Imp.)	0	231	Deep Headwater	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
523100	Little Nelligan Lake	0	26	Deep Lowland	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
517400	Little Peshtigo River	0	71.93	FAL	WWSF	Fully Supporting	Default FAL	NA	NA	Monitored	NA
522600	Marsh Lake	0	11.57	Deep Headwater	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
502800	Mattrich Lake	0	12.81	Deep Seepage	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
519900	McDonald Creek	0	9.45	Cold (Class I Trout)	Cold (Class I Trout)	Fully Supporting	Cold	NA	NA	Monitored	NA

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Designated Use	Impairments	Sources	Assessment	Impaired Water Status
518400	Messenger Creek	0	1.05	Cold (Class I Trout)	Cold (Class I Trout)	Fully Supporting	Cold	NA	NA	No Assessment on File	NA
518400	Messenger Creek	1.06	3.57	Cold (Class II Trout)	Cold (Class II Trout)	Fully Supporting	Cold	NA	NA	Monitored	NA
518400	Messenger Creek	3.57	7.34	Cold Class I	Cold Class I	Fully Supporting	Cold	NA	NA	Monitored	NA
518300	Montanna Lake	0	135	Deep Lowland	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
522100	Murphy Creek	0	1.14	Cold (Class II Trout)	Cold Class II	Not Assessed	Cold	NA	NA	No Assessment	NA
522100	Murphy Creek	1.44	5.78	Cold (Class I Trout)	Cold Class I	Not Assessed	Cold	NA	NA	No Assessment	NA
522100	Murphy Creek	6.13	6.15	Cold Class I	Cold Class I	Not Assessed	Cold	NA	NA	No Assessment	NA
522400	Murphy Lake	0	13.93	Deep Lowland	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
523000	Nelligan Lake	0	32	Reservoir	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
503100	Newbar Lake	0	17.97	Deep Seepage	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
520400	North Branch Beaver Creek	0	2.8	Cold Class II	Cold Class II	Fully Supporting	Cold	NA	NA	Monitored	NA
520400	North Branch Beaver Creek	2.8	11.86	Cold Class I	Cold Class I	Fully Supporting	Cold	NA	NA	Monitored	NA
523500	Perch Lake	0	7.95	Small	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
503800	Rainbow Lake	0	2.21	Small	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
426500	Reader Lake	0	8.08	Small	FAL	Supporting	Default FAL	NA	NA	Monitored	NA

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Designated Use	Impairments	Sources	Assessment	Impaired Water Status
504300	Rost Lake	0	91	Deep Seepage	FAL	Fully Supporting	Default FAL	NA	NA	Monitored	NA
518100	School Creek	0	2.19	Cold Class II	Cold Class II	Not Assessed	Cold	NA	NA	No Assessment	NA
5532480	Second Lak	0	5.94	FAL	FAL	Not Assessed	Default FAL	NA	NA	Evaluated: Modeled Data	NA
519100	Second Lake	0	6.61	Small	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
521000	South Branch Beaver Creek	0	7.66	Cold (Class II Trout)	Cold Class II	Not Assessed	Cold	NA	NA	No Assessment	NA
521000	South Branch Beaver Creek	7.66	16.88	Cold (Class I Trout)	Cold Class I	Not Assessed	Cold	NA	NA	No Assessment	NA
519700	Underwood Lake	0	43	Deep Seepage	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
520700	Walker Creek	0	3	Cold (Class I Trout)	Cold Class I	Fully Supporting	Cold	NA	NA	No Assessment	NA
523600	Whiskey Creek	0	6.62	Cold (Class II Trout)	Cold Class II	Fully Supporting	Cold	NA	NA	Monitored	NA
515100	White Potato Lake	0	978	Shallow Seepage	FAL	Supporting	Default FAL	NA	NA	Monitored	NA

<sup>i</sup> 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.