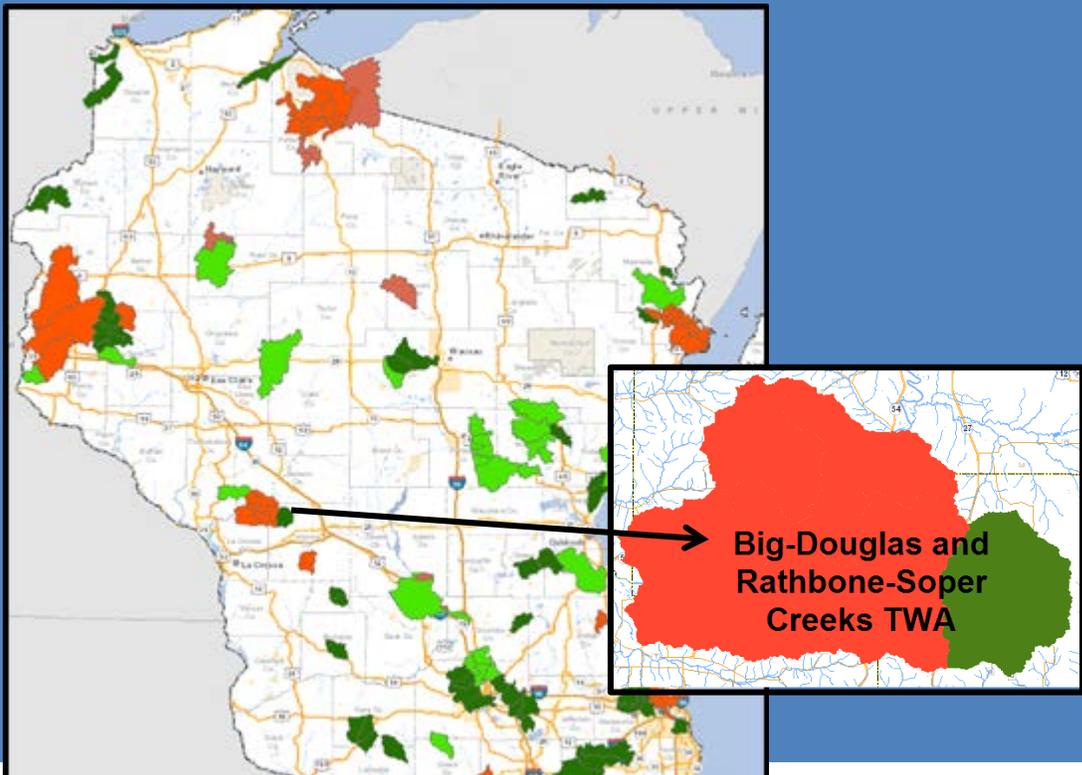




Soper Creek at Deerwood Road
Photo by Kurt Rasmussen, DNR

**BIG-DOUGLAS AND RATHBONE-SOPER
TWA WQM PLAN 2017**
Big and Douglas Creeks (BR03)
HUC: 070400071201, Monitored 2014



EGAD # 3200-2017-16
Water Quality Bureau,
Wisconsin DNR

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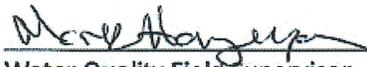
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Wisconsin Water Quality Monitoring and Planning

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.

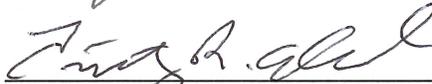
This plan is hereby approved by the Wisconsin DNR Water Quality Program and is a formal update to the Black River Basin Areawide Water Quality Management Plan and Wisconsin’s Statewide Areawide Water Quality Management Plan. This plan will be forwarded to USEPA for certification as a formal plan update.


Water Quality Field Supervisor

1/31/18
Date


Greg Searle, Water Quality Bureau Field Operations Director

2/6/18
Date


Timothy Asplund, Water Quality Bureau Monitoring Section Chief

2/6/18
Date

Basin/Watershed Partners

- Friends of the Black River

Report Acknowledgements

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- Kurt Rasmussen, Water Quality Biologist, Western District, 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

Rathbone and Soper Creeks originate on the east side of the watershed and flow west before joining Big Creek, which flows into the Black River. There are 375 miles of streams in the Big-Douglas Creeks watershed, of which 43.3 miles are outstanding or exceptional resource waters, 74.9 miles are trout waters, and 80.8 miles are impaired. Rathbone and Soper Creeks are part of the Big and Douglas Creeks watershed (BR03).

The Big and Douglas Creeks watershed encompasses approximately 210 square miles in Jackson, Monroe and La Crosse counties. A small portion also lies in Trempealeau County. The conversion of land to agricultural uses is not extreme. However, the sandy soils, which characterize this watershed, are prone to erosion with little disturbance. Many streams within the watershed naturally contain shifting sand bottoms. Some streams have exposed banks that contribute sand and sediment during high flow events.

Land Use

The Big and Douglas Creeks watershed is 210.33 mi². Land use in the watershed is primarily forest (53%), agricultural (33%) and a mix of grassland (7%) and other uses (7%) open land and water, wetlands, and suburban (Figure 2). This watershed has 375.17 stream miles, 473.57 lake acres and 7,564.97 wetland acres.

Ecological Landscapes

This watershed is located in the Western Coulee and Ridges Ecological Landscape in southwestern and west central Wisconsin and is characterized by its highly eroded, driftless topography and relatively extensive forested landscape. Several large rivers including the Wisconsin, Mississippi, Chippewa, Kickapoo and Black flow through or border the Ecological Landscape.

Historical vegetation consisted of southern hardwood forests, oak savanna, scattered prairies, and floodplain forests and marshes along the major rivers. With Euro-American settlement, most of the land on ridgetops and valley bottoms was cleared of oak savanna, prairie, and level forest for agriculture. The steep slopes between valley bottom and ridgetop, unsuitable for raising crops, grew into oak-dominated forests after the ubiquitous presettlement wildfires were suppressed. Current vegetation is a mix of forest (40%), agriculture, and grassland with some wetlands in the river valleys. The primary forest cover is oak-hickory (51%) dominated by oak species and shagbark hickory. Maple-basswood

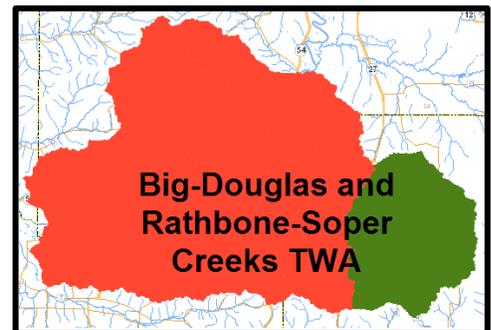


Figure 1: Big-Douglas and Rathbone-Soper Creeks Watershed.

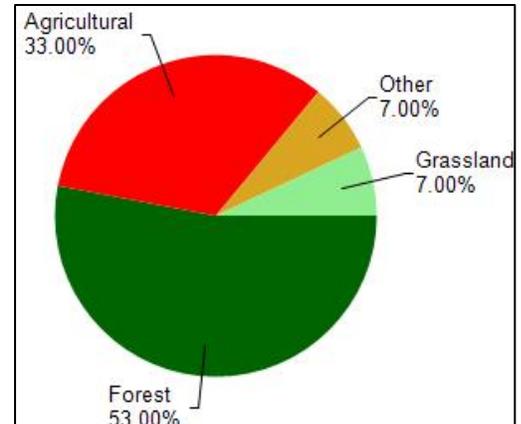


Figure 2: Land Use in Big and Douglas Watershed (BR03).

forests (28%), dominated by sugar maple, basswood and red maple, are common in areas that were not subjected to repeated presettlement wildfires. Bottomland hardwoods (10%) are common in the valley bottoms of major rivers and are dominated by silver maple, ashes, elms, cottonwood, and red maple. Relict conifer forests including white pine, hemlock and yellow birch are a rarer natural community in the cooler, steep, North Slope microclimates.

Hydrology

The Big and Douglas Creeks HUC 10 watershed covers roughly 210 square miles in Jackson, La Crosse, and Monroe counties. Sandy soils dominate throughout the watershed and are easily susceptible to erosion. The streams throughout the watershed are comprised mostly of shifting sand bottoms and some streams have unprotected banks that contribute sand and sediment during high flow events, such as major storms. Sand and sediment deposits reduce the depth of streams and when combined with high flows, can widen the streams. As streams become wider and shallower, temperatures can rise and exceed the range conducive to the survival of trout.

Study Summary

This Targeted Watershed Assessment (TWA) was conducted in the Big-Douglas HUC 10 and Rathbone-Soper HUC 12 watersheds. The Rathbone and Soper Creeks HUC 12 subwatershed lies at the eastern end within the Big and Douglas Creeks watershed and was identified for evaluation due to stressed biological surveys. The Rathbone-Soper HUC 12 watershed was selected as one of the TWAs for the Western District to monitor in the 2014 field season. Nineteen sites throughout the watershed were selected for fish, habitat, macroinvertebrate, and water chemistry sampling. The sites were monitored in 2014 to evaluate and document current stream conditions and potential impairments (Figure 4). An additional eight sites in the adjacent Rathbone-Soper HUC 12 subwatershed were surveyed for a more targeted assessment of this smaller area, including the pour point of the watershed which included growing season total phosphorus sampling. A total of twenty-seven sites were surveyed in the HUC10 watershed and HUC12 subwatershed.

Management Recommendations

- The department should work with watershed organizations and county land and water conservation departments on outreach efforts with landowners in the watershed to educate citizens on the importance of streams and techniques for preserving and improving stream corridors and reducing fine sediment delivery to streams.
- The department should review land use and nutrient management efforts in the Big-Douglas watershed and Rathbone-Soper subwatershed to determine if any improvements can be made to reduce phosphorus delivery to the streams.
- Dustin Creek should be considered for listing in the 2018 or later impaired waters list due to exceedances of the total phosphorus criteria.
- Rathbone and Jenkins Valley Creeks should have additional phosphorus monitoring to determine if the phosphorus criteria is exceeded; the samples collected should fill known “gaps” in monthly data for the statistical approach used for assessments.
- Monitoring of phosphorus concentrations in the streams of the Big-Douglas and Rathbone-Soper Creeks areas should continue as funding and volunteer efforts allow.

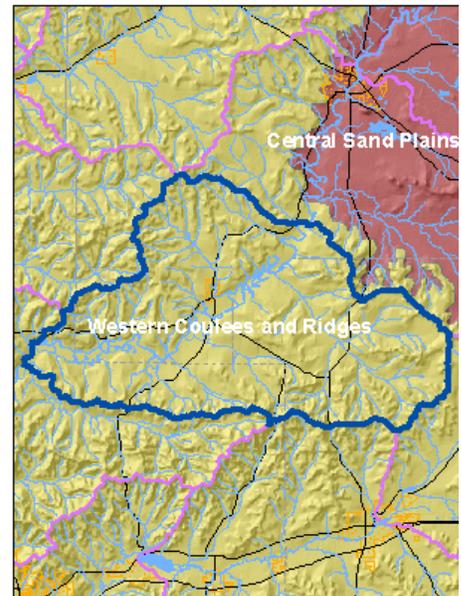


Figure 3: Ecological Landscapes in the Big and Douglas Watershed.

- In areas with heavy grazing, managed grazing and rotational grazing could be implemented to protect riparian corridors. Other agricultural practices and nutrient management plans could help reduce erosion and runoff to streams.
- Follow up monitoring should be completed on streams with poor IBI scores or lack of fish to further evaluate conditions.
- Habitat improvements could be implemented on streams that have documented steep eroding banks if funding becomes available.
- Perched culverts and improperly constructed stream crossings are a barrier to aquatic organism movement. Land-owners, municipalities, and local units of government should work with DNR to look for opportunities to improve fish passage during replacement of existing culverts and stream crossings. This helps ensure their projects use the appropriate best management practices to meet minimum state water quality standards.

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. The ORW and ERW waterbodies are listed in Table 1.

Table 1: List of outstanding and exceptional resources waters in Big and Douglas Creeks (BR03).

Local Waterbody Name	WBIC	ORW/ERW	Start Mile	End Mile
Big Creek	1692900	ERW	1.49	6.49
Douglas Creek	1691300	ERW	4.13	9.99
Dustin Creek	1694300	ERW	0	3.68
Unnamed Creek 30-15 (N Br Shake Hollow Cr)	1692100	ERW	1.16	3.95
Sand Creek	1689700	ERW	0	10.21
Soper Creek	1693400	ERW	0	7.97
Spencer Creek	1693300	ERW	0	3.21
Creek 19n, 5w, 34nese	1689900	ERW	0	4.47

Trout Waters

DNR uses three categories to classify the different types of trout streams throughout Wisconsin. These are evident in Wisconsin Trout Stream Maps, which provides a comprehensive list of trout streams and a set of trout stream maps covering the majority of the state. 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 carrying 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. Generally, there is no carryover of trout from one year to the next.

Table 2: List of trout waters in Big and Douglas Creeks watershed (BR03).

Local Waterbody Name	WBIC	Start Mile	End Mile	Trout Class
Sand Creek	1689700	0	10.21	CLASS I
Creek 19n, 5w, 34nese	1689900	0	4.47	CLASS I
Douglas Creek	1691300	2.06	4.12	CLASS II
Big Creek	1692900	1.49	6.49	CLASS II
Soper Creek	1693400	0	7.97	CLASS I
Jenkins Valley Creek	1693500	0	4.16	CLASS II
Spencer Creek	1693300	0	3.21	CLASS I
Spencer Creek	1693300	3.22	6.55	CLASS II
Creek 2-1 (T18N, R6W)	1689100	0	3.86	CLASS II
Davis Creek	1689300	0	6.86	CLASS II
Douglas Creek	1691300	4.13	9.99	CLASS I
Creek 13-3a	3000395	0	0.29	CLASS I
Creek 13-3b	3000396	0	0.24	CLASS I
Creek 24-4	3000361	0	1.05	CLASS II
Big Creek	1692900	6.66	6.77	CLASS I
Rathbone Creek	1694000	0	6.2	CLASS II
Dustin Creek	1694300	0	3.68	CLASS I
Creek 19n, 3w, 29 Nwnw	1694800	0	0.58	CLASS II
Unnamed Creek 30-15 (N Br Shake Hollow Cr)	1692100	1.16	3.95	CLASS I
Big Creek	1692900	0	1.49	CLASS II
30-15 Cr - North Branch Shake Hollow Creek	1692100	0	1.17	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). The listed impaired waters in this project result from nonpoint sources, atmospheric deposition, and livestock (grazing or feeding). Pollutants include total phosphorus, PCBs, mercury, total suspended solids.

Table 3: List of impaired waters in the Big and Douglas Creeks watershed (BR03).

Waterbody Name	WBIC	Start Mile	End Mile	Pollutant	Impairment	Sources	303 Status
Big Creek	1692900	0	6.49	Total Phosphorus	Water Quality Use Restrictions	Non-Point Source (Rural or Urban)	303d Listed
Black River	1676700	0	24.44	PCBs Mercury	Contaminated Fish Tissue	Non-Point Source Atmospheric Deposition - Toxics	303d Listed

Waterbody Name	WBIC	Start Mile	End Mile	Pollutant	Impairment	Sources	303 Status
Black River	1676700	0	24.44	Total Phosphorus	Impairment Unknown	Non-Point Source Atmospheric Deposition - Toxics	303d Listed
Black River	1676700	24.44	60.78	PCBs	Contaminated Fish Tissue	Non-Point Source Atmospheric Deposition - Toxics	303d Listed
Davis Creek	1689300	0	6.86	Total Phosphorus	Water Quality Use Restrictions	Non-Point Source	Proposed for List
Douglas Creek	1691300	0	1.75	Total Phosphorus	Water Quality Use Restrictions	Non-Point Source	Proposed for List
Douglas Creek	1691300	2.06	4.12	Total Phosphorus	Water Quality Use Restrictions	Non-Point Source	Proposed for List
Douglas Creek	1691300	4.13	9.99	Total Phosphorus	Water Quality Use Restrictions	Non-Point Source	Proposed for List
Hardies Creek	1686900	0	1.64	Sediment/Total Suspended Solids	Degraded Habitat	Non-Point Source	TMDL Approve d
Mill Creek	1688500	2.5	5.46	Sediment/Total Suspended Solids	Degraded Habitat	NA	303d Listed
Printz Creek	1693100	0	3.06	Sediment/Total Suspended Solids	Degraded Habitat	Livestock (Grazing or Feeding Operations), Non- Point Source	303d Listed
Roaring Creek	1695200	0	5.34	Sediment/Total Suspended Solids	Degraded Habitat	Livestock (Grazing or Feeding Operations), Non- Point Source	303d Listed
Roaring Creek	1695200	0	5.34	Total Phosphorus	Water Quality Use Restrictions	Livestock (Grazing or Feeding Operations), Non- Point Source	Addition
Sand Creek	1689700	0	10.21	Total Phosphorus	Water Quality Use Restrictions	Non-Point Source	Proposed for List
Soper Creek	1693400	0	7.97	Total Phosphorus	Impairment Unknown	Non-Point Source	Proposed for List
White Creek	1691700	0	3.1	Sediment/Total Suspended Solids	Degraded Habitat	Non-Point Source Streambank Modifications/destabilizati on	303d Listed
Woodward Creek	1691900	0	4	Sediment/Total Suspended Solids	Degraded Habitat	Non-Point Source Streambank Modifications	303d Listed

Monitoring Project Discussion

Purpose of Project

The Rathbone and Soper HUC 12 subwatershed lies at the eastern end within the Big and Douglas Creeks watershed. This subwatershed was selected for evaluation due to stressed biological surveys. Nineteen sites were sampled throughout the Big-Douglas Creeks watershed, and an additional eight sites were selected in the Rathbone-Soper subwatershed specifically to get a more targeted assessment of this smaller area highlighted in the map below (Figure 4).

Site Selection and Study Design

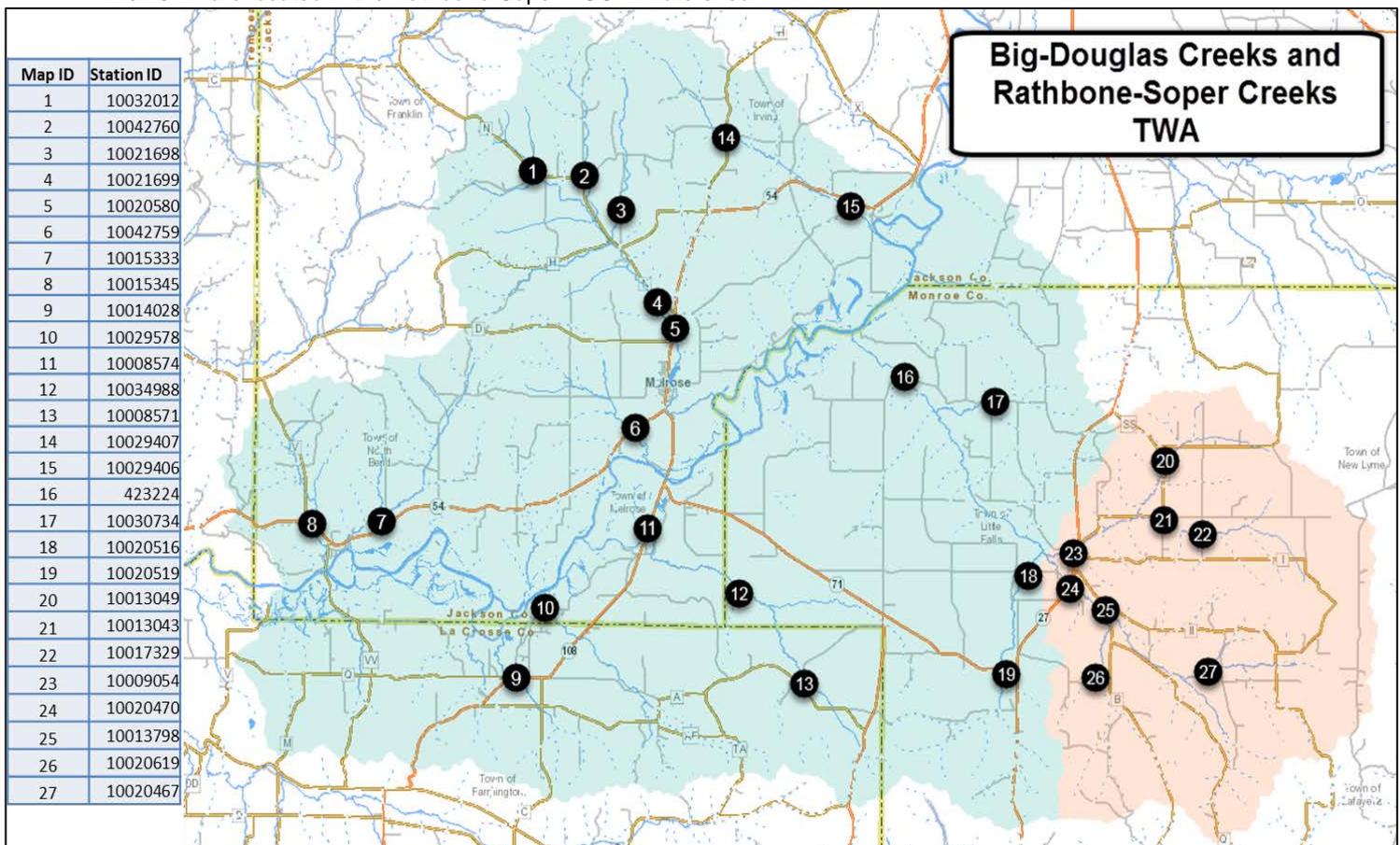
The Rathbone-Soper TWA consisted of Fish Index of Biological Integrity (FIBI), Macroinvertebrate Index of Biological Integrity (MIBI) surveys, Hilsenhoff Biotic Index (HBI), total phosphorus (TP) samples, and qualitative habitat surveys conducted at 8 sites as well as at 19 sites within the Big-Douglas Creeks HUC 10 (Table 4). Five of the HUC 10 and 2 of the HUC 12 sites had growing season phosphorus collected. There were six additional one-time grab phosphorus samples collected throughout the Rathbone-Soper Creeks HUC 12 watershed. One of the growing season phosphorus sites, the pour point of the HUC 12, also received six growing season TP samples, along with one time nitrogen series, total suspended solids and chloride samples.

Table 4: Monitoring Stations in the Big-Douglas and Rathbone-Soper Creeks TWA.

Station ID	Station Name	WaterBody Name	WBIC	Map ID
10032012	Douglas Creek at Vinger Road	Douglas Creek	1691300	1
10042760	North Branch Douglas Creek at West Bolger Rd	North Branch Douglas Creek	1692100	2
10021698	Woodward Creek Downstream Selmer Road (Farthest Downstream Crossing)	Woodward Creek	1691900	3
10021699	White Creek Upstream Cth N	White Creek	1691700	4
10020580	Douglas Creek at Sth 54	Douglas Creek	1691300	5
10042759	Unnamed Trib (1690100) to Black R at STH 54	Unnamed	1690100	6
10015333	Mill Creek - Sandburg Rd Xing	Mill Creek	1688500	7
10015345	Wilson Creek - Hwy 54	Wilson Creek	1688300	8
10014028	Creek 2-1(Burr Oak Creek)Station 2-1958-Nw 1/4 Nw 1/4 S12-Starts At Farm Road Bridge Crossing.	Unnamed	1689100	9
10029578	Davis Creek St. at Stetzer Rd	Davis Creek	1689300	10
10008574	Sand Creek At Hwy 108	Sand Creek	1689700	11
10034988	Sand Cr north DNR parking lot down hill trail to water	Sand Creek	1689700	12
10008571	Sand Creek Station Sommers Rd.	Sand Creek	1689700	13
10029407	Roaring Creek at CTH H	Roaring Creek	1695200	14
10029406	Roaring Creek at Cutoff Road	Roaring Creek	1695200	15
423224	Big Creek at Acorn Ave	Big Creek	1692900	16
10030734	Printz Creek at Acorn Ave	Printz Creek	1693100	17
10020516	Spencer Creek St. 2 Canary Ave. Crossing	Spencer Creek	1693300	18
10020519	Spencer Creek St. 5 Hwy 71 Crossing	Spencer Creek	1693300	19
10013049	Dustin Creek St. 2 - 2005 Cty Hwy S	Dustin Creek	1694300	20

Station ID	Station Name	WaterBody Name	WBIC	Map ID
10013043	Rathbone Creek St. 2 -2005 State Land Just Upstream Of Benton Road	Rathbone Creek	1694000	21
10017329	Rathbone Creek St. 2 Catbird Rd. Bridge Crossing Downstream	Rathbone Creek	1694000	22
10009054	Rathbone Creek #1- Hwy 27 Bridge	Rathbone Creek	1694000	23
10020470	Soper Creek St. 1 Carmel Ave. Crossing	Soper Creek	1693400	24
10013798	Soper Creek Station 1 - Driveway Crossing Near Cth B	Soper Creek	1693400	25
10020619	Jenkins Valley Creek at Dayton Avenue	Jenkins Valley Creek	1693500	26
10020467	Soper Creek St. 7 300ft Downstream Of Deerwood Rd.	Soper Creek	1693400	27

Figure 4: Map of monitoring stations in the Big-Douglas Creeks; Rathbone-Soper Creeks TWA. Stations with map IDs 20-27 are located in the Rathbone-Soper HUC12 watershed.



Methods

Fish surveys were completed at twenty-seven sites throughout the Big and Douglas Creeks HUC 10 watershed (eight sites were specific to the Rathbone and Soper Creeks HUC12). Backpack and stream shocking equipment were used following the current protocol for assessing fish communities (WDNR, 2001). Fish species were identified and counted at each site and the data was used to calculate an FIBI

score for each site. “The IBI is a multimetric index that rates the existing structure, composition, and functional organization of the fish assemblage with regional and habitat-specific expectations derived from comparable high-quality ecosystems” (Lyons et al., 1996).

Qualitative habitat surveys were completed at each site on the same day that the fish surveys were conducted according to the current protocol (WDNR, 2007). The habitat survey station length is based on the mean stream width (MSW) multiplied by 35, with a minimum station length of 100 meters and a maximum of 400 meters. There are seven different visually estimated habitat parameters that are recorded for streams less than 10 meters wide. Visual estimations were made while performing fish survey collections and other stream assessments and recorded on the qualitative habitat form after observing the entire station length. Each habitat parameter was given a numeric score and a rating of excellent, good, fair, or poor. The numeric value for all seven parameters was then summed to provide an overall rating of stream habitat quality (excellent ≥ 75 , good 50-74, fair 25-49, and poor < 25).

Aquatic invertebrates were also sampled at each site using a D-framed kicknet and collecting macroinvertebrates according to the protocol for wadeable streams (WDNR, 2000). Kicknet samples were collected from riffle areas and preserved with denatured alcohol. The samples were then sent to the University of Wisconsin - Stevens Point for sorting and identification. The macroinvertebrate results were evaluated using the Hilsenhoff Biotic Index (HBI) which provides a relative measure of organic loading to a stream based on the invertebrates that are present (Hilsenhoff, 1987). The HBI ranges on a scale from 0 to 10, where water quality improves as the index score decreases.

The MIBI was also used to evaluate the quality of each stream site. The MIBI was developed for streams within specific eco-regions of Wisconsin. The IBI includes metrics related to assemblage composition, structure, and function and it assesses a wide range of environmental conditions including land use, habitat, and water quality (Weigel, 2003). The MIBI also uses a scale ranging from 0 to 10, where overall stream quality and biotic integrity improves as the score increases.

Water quality measurements were also collected. Grab total phosphorus samples were collected monthly from May through October at seven locations- five at the pour points in each HUC12 subwatershed within the Big and Douglas Creeks HUC10 and two within the Rathbone and Soper-Creeks HUC12 subwatershed. Samples were collected and analyzed following criteria outlined in the Wisconsin 2014 Consolidated Assessment and Listing Methodology Document (WisCALM) (WDNR, 2013). The total phosphorus water quality criterion for wadeable streams is 75 $\mu\text{g/L}$ and can be found in NR 102.06 of Wisconsin Administrative Code. WisCALM describes the procedure to evaluate total phosphorus data by calculating a 90% upper and lower confidence limit. If the lower confidence limit (LCL) exceeds the criteria by two fold (150 $\mu\text{g/L}$ for wadeable streams) an overwhelming exceedance of the criterion is found and the stream is placed on the impaired water list.

Project Results

Below are the survey site results for both the Big and Douglas Creeks HUC10 watershed and the Rathbone and Soper Creeks HUC12 subwatershed organized by waterbody.

Big and Douglas Creeks Watershed Sites

Big Creek (WBIC: 1692900)

Big Creek is a one and a half-mile cool-cold mainstem stream and is listed on the impaired waters list for total phosphorus levels exceeding the statewide criteria. Big Creek was surveyed at Acorn Ave. The fish

IBI rating was excellent and the community was dominated by brook trout, white suckers, western blacknose dace, and burbot.

The qualitative habitat score for this site was 53, which is good. The stream was wide and relatively deep and the riparian buffer was protected. Factors limiting habitat include fine sediment and a lack of fish cover. Although fine sediment deposition was an issue to habitat, this stream most likely has a naturally sandy bottom. The HBI and MIBI ratings were excellent and there is no apparent organic pollution at this stream site. Total phosphorus monitoring indicates concentrations exceed the statewide criteria with a median concentration of 0.2165 mg/L. This high phosphorus concentration is consistent with the impaired waters listing for TP.

Unnamed (Burr Oak) Creek (WBIC: 1689100)

This Unnamed (Burr Oak) Creek is a four-mile cool-cold headwater stream located in La Crosse County. This stream is classified as a Class II Trout Water by the Fisheries Program. Johnny darters were the only species found in this stream, which indicates the fish community is poor based on the IBI score of 20.

The qualitative habitat score for this site was 28, which is fair. The stream was relatively shallow and wide and the substrate was primarily sand and silt. The channel was very incised with eroding stream banks and substantial sand deposition. There was also limited cover for fish. The riparian buffer was protected. The HBI rating was very good with possibly slight organic pollution present. The MIBI rating indicated a good overall macroinvertebrate community.

Davis Creek (WBIC: 1689300)

Davis Creek is a coldwater tributary to the Black River and is classified as a Class II trout stream. The stream is currently listed as impaired for total phosphorus. The fish community found at this site was composed of brook trout and burbot and the IBI rating was excellent.

The qualitative habitat score and rating for this site was 38 and fair, respectively. The stream was relatively wide and shallow with some deep holes near woody debris. The riparian area was very well protected and there was limited bank erosion and survey notes indicated heavy growth of tag alders throughout the stream corridor. Limitations of the habitat of this stream appear to be fine sediment deposition and limited fish cover.

Macroinvertebrate ratings were excellent for both HBI and MIBI with no apparent organic pollution. Growing season total phosphorus monitoring indicates the concentrations exceed the statewide criteria with a median concentration of 0.289 mg/L. This high total phosphorus concentration is consistent with the impaired waters listing for TP for Davis Creek.

Douglas Creek (WBIC: 1691300)

Douglas Creek, is a tributary to the Black River and is a Class I and II trout stream upstream of Melrose. The entire stream is currently listed as impaired for total phosphorus. Both sites surveyed on Douglas Creek rated good for fish IBI scores. The site at State Highway 54 was a cool-cold mainstem dominated by brook stickleback; however, two individual trout were also found. The site at Vinger Road was a coldwater stream dominated by brook trout.

The qualitative habitat score at STH 54 was the lowest scoring site from all surveys and was rated as poor and the score at the Vinger Road site was within the fair range. The stream at STH 54 was very wide and shallow with additional habitat limitations including shifting sand bottom, very little fish cover

and limited pool areas. Field notes indicated the channel was very incised with high banks (6-8 feet) and severe erosion with little canopy cover. The riparian area consisted of pasture. Habitat at Vinger Road was better with more cobble and gravel present, as well as more fish cover. The stream reach was similar to the STH 54 reach though in that it was also very incised with substantial erosion and sand deposition.

The HBI ratings at both the STH 54 and Vinger Road sites were very good with the possibility of slight organic pollution. The MIBI scores were excellent for the STH 54 reach and good for the reach at Vinger Road. Growing season total phosphorus monitoring was collected at the STH 54 site which gave a median concentration of 0.3995 mg/L, which exceeds the statewide criteria. The high total phosphorus concentration at this location is consistent with the impaired waters listing for TP for Douglas Creek.

Mill Creek (WBIC: 1688500)

Mill Creek is a tributary of the Black River and is currently listed as impaired from Manser Road upstream for degraded habitat caused by sediment. No fish were found at the Sandburg Road site when sampled as part of this assessment in 2014 and, therefore; a FIBI rating could not be calculated.

The qualitative habitat score and rating were 25 and fair, respectively. The stream channel was very wide, shallow, and incised. The bottom substrate consisted of shifting sand with fine sediment deposition. Streambanks were moderately eroded and fish cover was sparse. The HBI rating was very good and the MIBI rating indicated a good macroinvertebrate community present at this site.

North Branch Douglas Creek (WBIC: 1692100)

The North Branch Douglas Creek flows for approximately four miles before it enters Douglas Creek north of Melrose in Jackson County. From its mouth to a little over a mile upstream the creek is classified as a Class II trout water. The rest of the stream to its headwaters is classified a Class I trout water. Only 11 fish were found when the stream was surveyed in the lower reaches at West Bolger Road, all of which were brook trout. A FIBI rating could not be calculated as a result of the low number of fish collected.

Qualitative habitat at this site scored 13, which was the second worst habitat score resulting in a poor rating. The stream was heavily pastured with frequent eroding areas and poor bank stability in general. According to survey notes, the banks were somewhat vegetated, but it did not extend far and the stream was littered with concrete and trash. The substrate was primarily sand with small amounts of gravel and clay and some areas had depositional sand as well. There was minimal fish cover and the stream was wide and shallow. Both the HBI and MIBI ratings were excellent with no apparent organic pollution.

Printz Creek (WBIC: 1693100)

Printz Creek is a three-mile long tributary to Big Creek near Little Falls in Monroe County. It is currently listed as impaired for degraded habitat caused by sediment. Only one brook trout was found in 2014 and, therefore; a FIBI rating could not be calculated.

Qualitative habitat at this location scored 30, resulting in a rating of fair. The channel was very incised with steep banks (5-7 feet). Field notes indicated the channel was relatively wide and shallow with limited fish cover as a result of shallow water depths. The stream banks were light to moderately eroded and sediment deposition was observed in the station. Both the HBI and MIBI scores for this location were excellent with no apparent organic pollution.

Roaring Creek (WBIC: 1695200)

Roaring Creek is a five-mile tributary to the Black River. The stream is listed on the impaired waters list for sediment and degraded habitat and total phosphorus exceedances. Roaring Creek was surveyed at two sites including CTH H and Cutoff Road. The fish community at both sites rated as poor. Johnny darters and brook stickleback were the only two species found in the 2014 fish assessment at the CTH H site and those same two species in addition to western blacknose dace were found at the Cutoff Road site.

The qualitative habitat rating was good at CTH H (score of 73) and fair at Cutoff Road (score of 28). Habitat at CTH H was limited by fine sediment deposition. According to survey notes, the stream was narrow and fairly deep and the banks were overgrown with reed canary grass. Habitat was more degraded at the Cutoff Road site and was limited by bank erosion, sediment deposition, and lack of fish cover. The stream bottom was mostly shifting sand with large sand deposition areas present and the channel was very wide and shallow. The riparian areas at both sites were protected.

The HBI scores were very good at both sites indicating some slight organic pollution. The MIBI ratings were fair for both the sites. Growing season total phosphorus monitoring was collected at the Cutoff Road site and the median concentration was 0.4205 mg/L, which exceeds the statewide criteria. The high TP concentration at this site is consistent with the impaired waters listing for Roaring Creek.

Sand Creek (WBIC: 1689700)

Sand Creek is a ten-mile tributary to the Black River and is classified as a Class I trout stream. This stream is currently listed as impaired for total phosphorus. Three sites were surveyed on Sand Creek including the Sand Creek Pines State Natural Area, STH 108 and Sommers Road. The site in the Sand Creek Pines State Natural Area did not have enough fish to assess the community or FIBI, although brook trout and a few other species were collected. The two other upstream sites had fish communities that were excellent based on their FIBI scores. The site at STH 108 contained nine species of fish with burbot, central mudminnows, and white suckers being most prevalent. Sand Creek at Sommers Road only had two species recorded with brook trout being the dominant species collected.

Qualitative habitat in Sand Creek at both the Sand Creek Pines State Natural Area and at STH 108 scored good with scores of 53 and 52, respectively. Both stations had very sandy substrates and were limited by fine sediment deposition. The site in the State Natural Area had a protected riparian area consisting of tag alders which provided some fish cover. The site at STH 108 had abundant aquatic plant growth and fish cover consisted of undercut banks and woody debris. In contrast, the site at Sommers Road scored 20, which rated as poor.

The stream was wide and shallow with limited pools or complex stream characteristics and the entire substrate was sand. Fish cover was also limited at this site. The HBI and MIBI scores were excellent at both the Sand Creek Pines State Natural Area site and at Sommers Road. The HBI and MIBI scores were very good and good, respectively at the STH 108 site. Growing season total phosphorus concentrations were collected at the STH 108 site and the median concentration was 0.3365 mg/L, which exceeds the statewide criteria. This high TP concentration is consistent with the impaired waters listing for Sand Creek.

Spencer Creek (WBIC: 1693300)

Spencer Creek is a tributary to Big Creek and is a Class I trout stream from the mouth to Hwy 71, then Class II upstream of Hwy 71. Two sites were surveyed on Spencer Creek including Canary Avenue and

STH 71. The fish community at the Canary Ave site was excellent based on the FIBI score. This site found five species of fish with brook trout being the most common. The site at STH 71 did not have enough fish collected to assess the fish community or FIBI, but brook trout and brook stickleback were found at this location.

Qualitative habitat in Spencer Creek at both the Canary Ave and STH 71 sites rated fair with scores of 43 and 38, respectively. Both sites were limited by fine sediment deposition. The Canary Ave site did have a very good wooded riparian buffer and abundant woody debris provided fish cover. Field notes indicated the site at STH 71 was deep and narrow with a pool present, but above the pool the stream became wide, shallow, and very sandy with overhanging tag alder and reed canary grass. The HBI and MIBI scores were excellent at both the Canary Ave and STH 71 sites.

Unnamed Creek (WBIC: 1690100)

This Unnamed Creek is an approximately five-mile long tributary to the Black River located in Jackson County. Fish survey results found a total of five fish consisting of two burbot and three sand shiners. Due to the lack of fish, a FIBI could not be calculated. The qualitative habitat rating at this site was fair. According to survey notes, the stream channel was very incised and bank erosion was moderate. The channel was also very shallow with a shifting sand bottom. Sediment deposition was observed and there was limited fish cover and lack of pools. The HBI rating was very good with slight organic pollution possible. The MIBI rating indicated a fair macroinvertebrate community at this site.

White Creek (WBIC: 1691700)

White Creek is a three-mile long tributary to Douglas Creek near Melrose in Jackson County. White Creek is currently listed as an impaired water for degraded habitat due to sediment. No fish were captured at the CTH N location in 2014 and, therefore; a FIBI rating could not be calculated. Qualitative habitat rated as fair for the site. According to field notes, the stream was extremely wide and shallow and the banks were very eroded. The substrate was almost all sand with some very deep depositional areas. Other limitations included lack of pool areas and complex stream characteristics as well as a lack of fish cover. The CTH N Bridge also had a concrete apron that was washed out and creating a fish barrier. The HBI rating was very good with slight organic pollution possible. The MIBI rating indicated a fair macroinvertebrate community at this location.

Wilson Creek (WBIC: 1688300)

Wilson Creek is a four and a half-mile long tributary to the Black River near North Bend in Jackson County. Wilson Creek was surveyed at State Road 54 and the fish community rated as fair. Burbot and white suckers comprised most of the five fish species found at this site.

Qualitative habitat rated as fair at the site. Field survey notes indicated the stream channel was very incised with moderate bank erosion. In addition, the channel was wide and shallow with a shifting sand bottom. Other factors limiting habitat include sediment deposition, limited fish cover, and lack of pools. The riparian areas were protected with woodland and shrub species. The HBI rating was very good with slight organic pollution possible. The MIBI rating indicated a good macroinvertebrate community at this location.

Woodward Creek (WBIC: 1691900)

Woodward Creek is a four-mile long tributary to Douglas Creek in the township of Irving in Jackson County. The entire creek is listed as impaired for degraded habitat due to sediment. The stream was surveyed at Selmer Road in 2014 and no fish were captured in the survey and, therefore; a FIBI rating

could not be calculated.

The qualitative habitat was fair at this location. According to field notes, the stream was very wide and shallow with all sand substrate. The banks were slightly eroded with areas of heavy sand deposition. Riparian areas within the survey area were wooded, but the upstream areas were all pasture and were more heavily eroded. Other limitations included lack of complex stream characteristics and fish cover. The HBI rating was very good with slight organic pollution possible and the MIBI rating indicated a good macroinvertebrate community at this location.

Rathbone and Soper Creeks Watershed Sites

Soper Creek (WBIC: 1693400)

Soper Creek is an eight-mile long tributary to Big Creek and is classified as a Class I trout stream. The stream is currently listed as impaired for total phosphorus. Three sites were surveyed on Soper Creek including Deerwood Road, Carmel Avenue, and CTH B. The site at Deerwood Road was rated as fair for the fish community although brook trout were the most common of the four species found. Fish habitat at Deerwood Road did not seem to be degraded. The other two sites at Carmel Ave and CTH B found fish communities that were rated as excellent and the most common species at both sites was brook trout.

Qualitative habitat scores were similar at the Deerwood Road (72) and CTH B (75) locations, with the Deerwood Road site rating as good and the CTH B site rating as excellent. The rating at the Carmel Ave site was fair. At Deerwood Road and CTH B, a limitation to habitat is fine sediment deposition. The stream sites otherwise have pools, good fish cover, and good riparian buffer areas. Habitat at the Carmel Ave site was limited by wide and shallow areas with a lack of coarse substrate and minimal fish cover. The HBI and MIBI ratings were both excellent for all three stream survey sites. Growing season total phosphorus at Carmel Ave and a grab phosphorus sample at CTH B both exceed the statewide criteria. A grab phosphorus sample at the Deerwood road location in the headwaters of Soper Creek had a concentration below the statewide criteria for total phosphorus. Overall, the phosphorus concentrations are consistent with the impaired waters listing for Soper Creek.

Dustin Creek (WBIC: 1694300)

Dustin Creek is an approximately four-mile long tributary to Rathbone Creek and is classified as a Class I trout stream. Dustin Creek was surveyed at CTH S and although this is a trout stream, no fish were captured at this site and, therefore; a FIBI rating could not be calculated.

The qualitative habitat score was fair. Survey notes indicated the stream was wide and shallow, but gradually became more deep and narrow. There was little stream bank erosion, the substrate was all sand, and the channel was not incised. Fish cover was limited, but became better in the deeper sections of the stream. There was livestock access along the stream riparian corridor, especially on the left bank. The HBI rating was very good with slight organic pollution possible. The MIBI rating indicated a good macroinvertebrate community. Both a grab total phosphorus sample and growing season total phosphorus median values were 0.22 mg/L, which exceeds the statewide criteria. This stream may be proposed for impairment listing in the next cycle due to nutrient criteria exceedances.

Jenkins Valley Creek (WBIC: 1693500)

Jenkins Valley Creek is a four-mile long tributary to Soper Creek in Little Falls in Monroe County and is classified as a Class I trout water. This stream was surveyed at Dayton Avenue and 11 fish represented by three species were found. Five of the 11 fish were brook trout. As a result of the lack of fish, an IBI rating could not be calculated.

The qualitative habitat rating was fair. Field notes indicated the stream consisted of very silty substrate with highly eroding banks. Fine sediment deposition and fish cover were additional limitations of the habitat in this stream. Agricultural land uses surrounded both sides of the riparian areas as well. The HBI rating was very good indicating possible light organic pollution. The MIBI rating indicated that the macroinvertebrate community was fair. A grab total phosphorus sample had a concentration of 0.360 mg/L, which exceeds the statewide criteria. Based on the high single grab concentration of total phosphorus, follow-up phosphorus monitoring should be conducted in order to assess if this water body should be added to the impaired waters list in the next cycle.



**Jenkins Valley Creek DS from Dayton Ave
Photo by Kurt Rasmussen**

Rathbone Creek (WBIC: 1694000)

Rathbone Creek is an approximately six-mile long tributary to Big Creek and is classified as a Class II trout stream. Three sites were surveyed on Rathbone Creek, including STH 27 upstream of Cataract Pond, Catbird Road, and Benton Road. The two sites at STH 27 and Catbird Road had excellent FIBIs and five fish species were found at each site. The Benton Road site had a FIBI rating of good and three fish species were captured. Brook trout were found at all three survey sites.

Qualitative habitat at STH 27 was fair and the limitations were lack of complex stream characteristics, fine sediment deposition, and lack of fish cover. Qualitative habitat scores at Catbird Road and Benton Road were both good. Both sites had similar habitat with limitations of fine sediment deposition and additionally at Benton Road a lack of fish cover. HBI ratings were excellent, very good, and good at STH 27, Catbird Road, and Benton Road, respectively. The good rating at Benton Road indicates there is some organic pollution present. The MIBI ratings indicated that the macroinvertebrate communities were excellent at all three locations. Grab phosphorus samples were collected at all three survey sites and the concentrations were 0.112 mg/L, 0.0428 mg/L, and 0.0290 mg/L at STH 27, Catbird Road, and Benton Road, respectively. Phosphorus concentrations were highest near the pour point and decreased moving upstream. Growing season phosphorus data should be collected in the future to further evaluate concentrations within this stream compared to the statewide criteria.

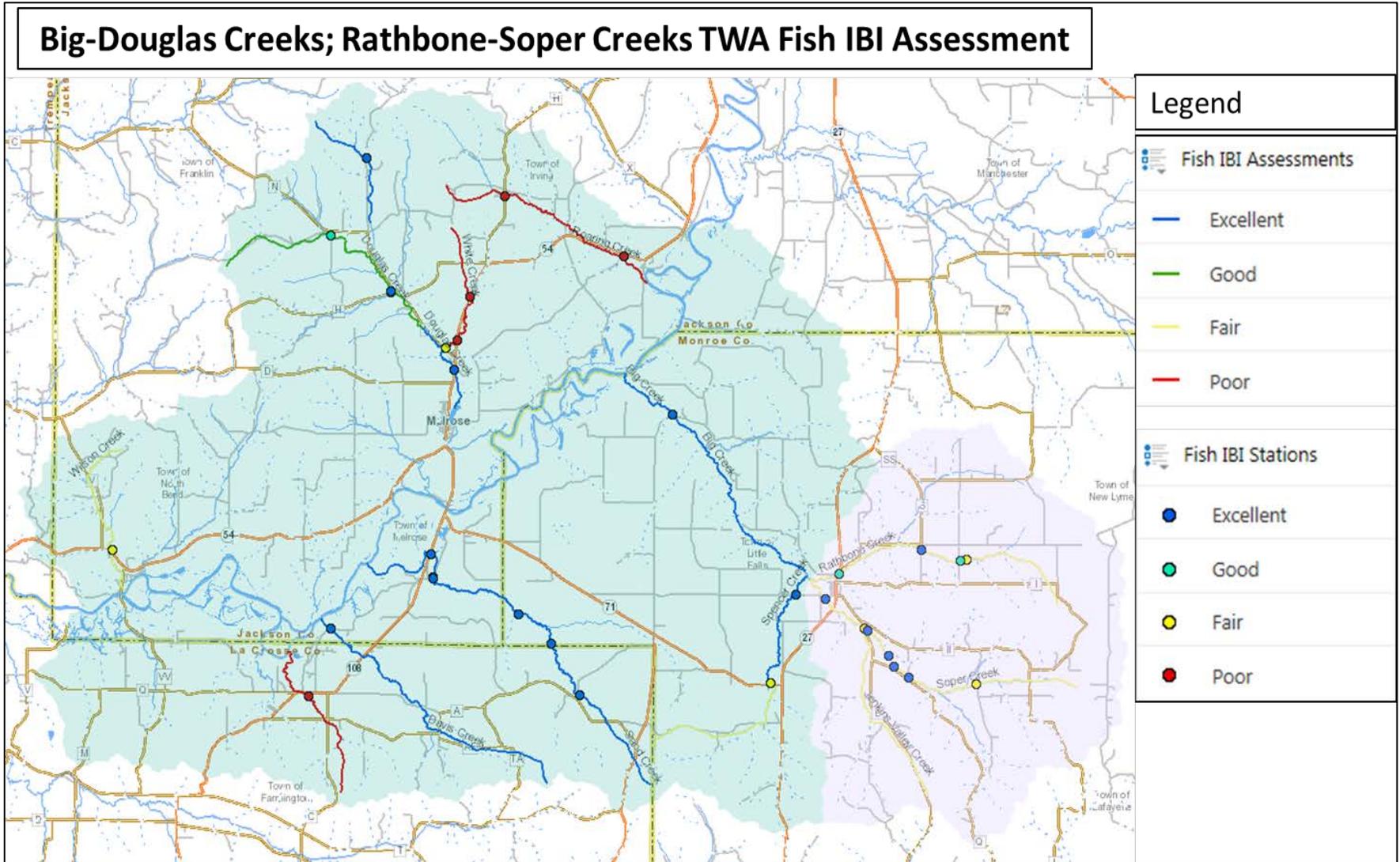


Figure 5: Map of the Fish IBI Assessment in the Big-Douglas Creeks (BR03) watershed and the Rathbone-Soper Creeks subwatershed.

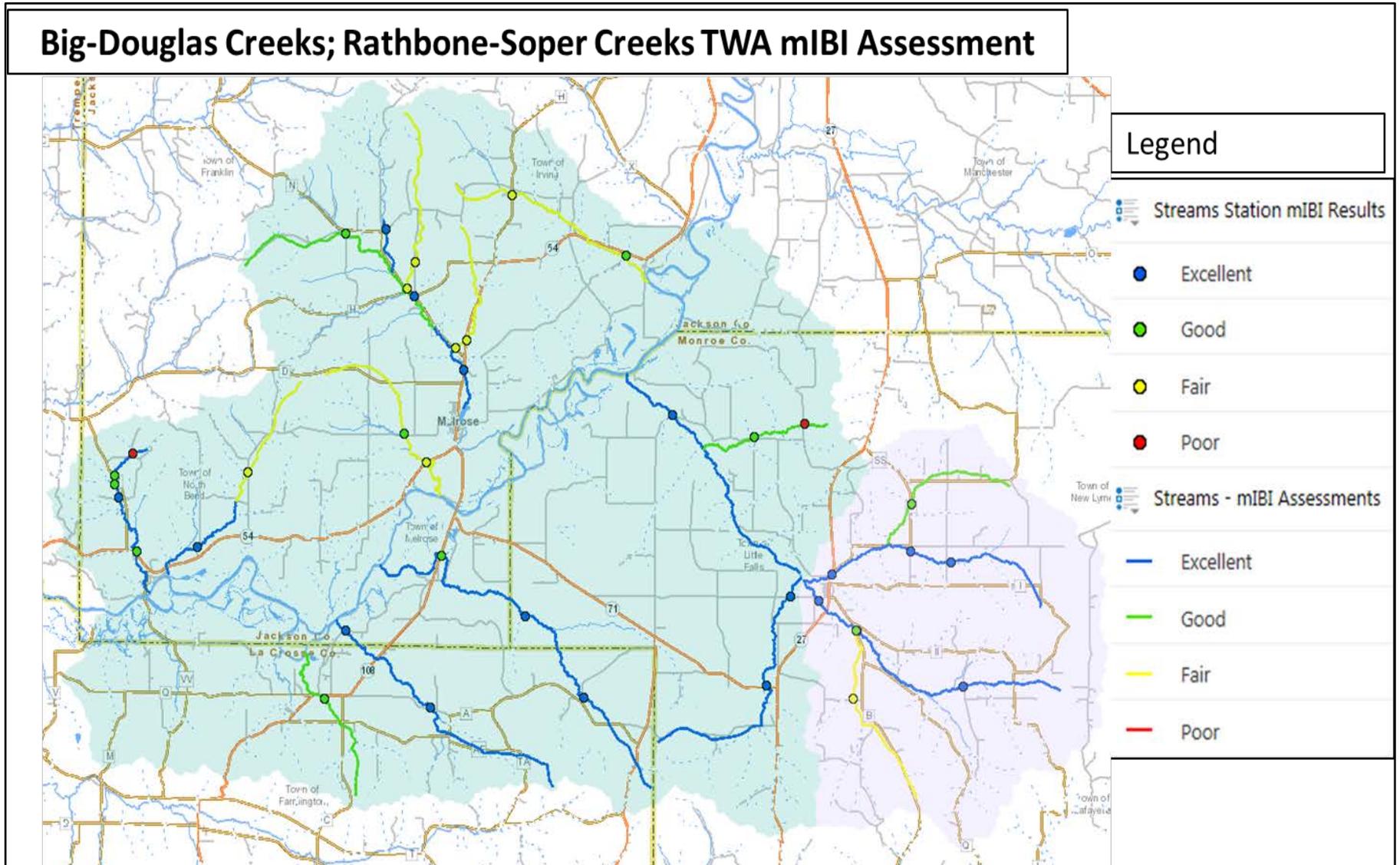


Figure 6: Map of the MIBI Assessment in the Big-Douglas Creeks (BR03) watershed and Rathbone-Soper Creeks subwatershed.

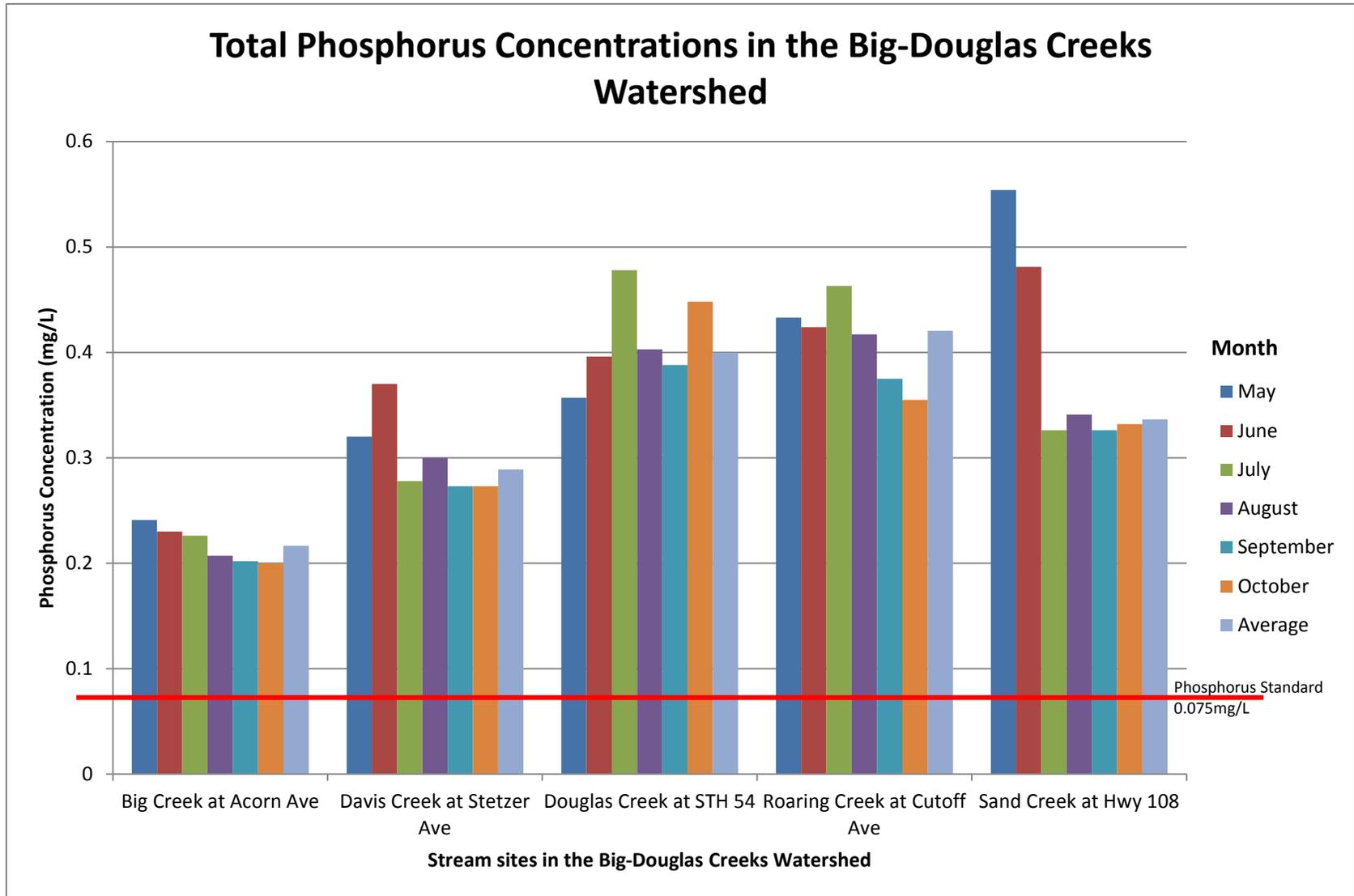


Figure 7: Graph showing monthly and average growing season total phosphorus concentrations in the Big-Douglas Creeks Watershed with the statewide phosphorus standard shown in red.

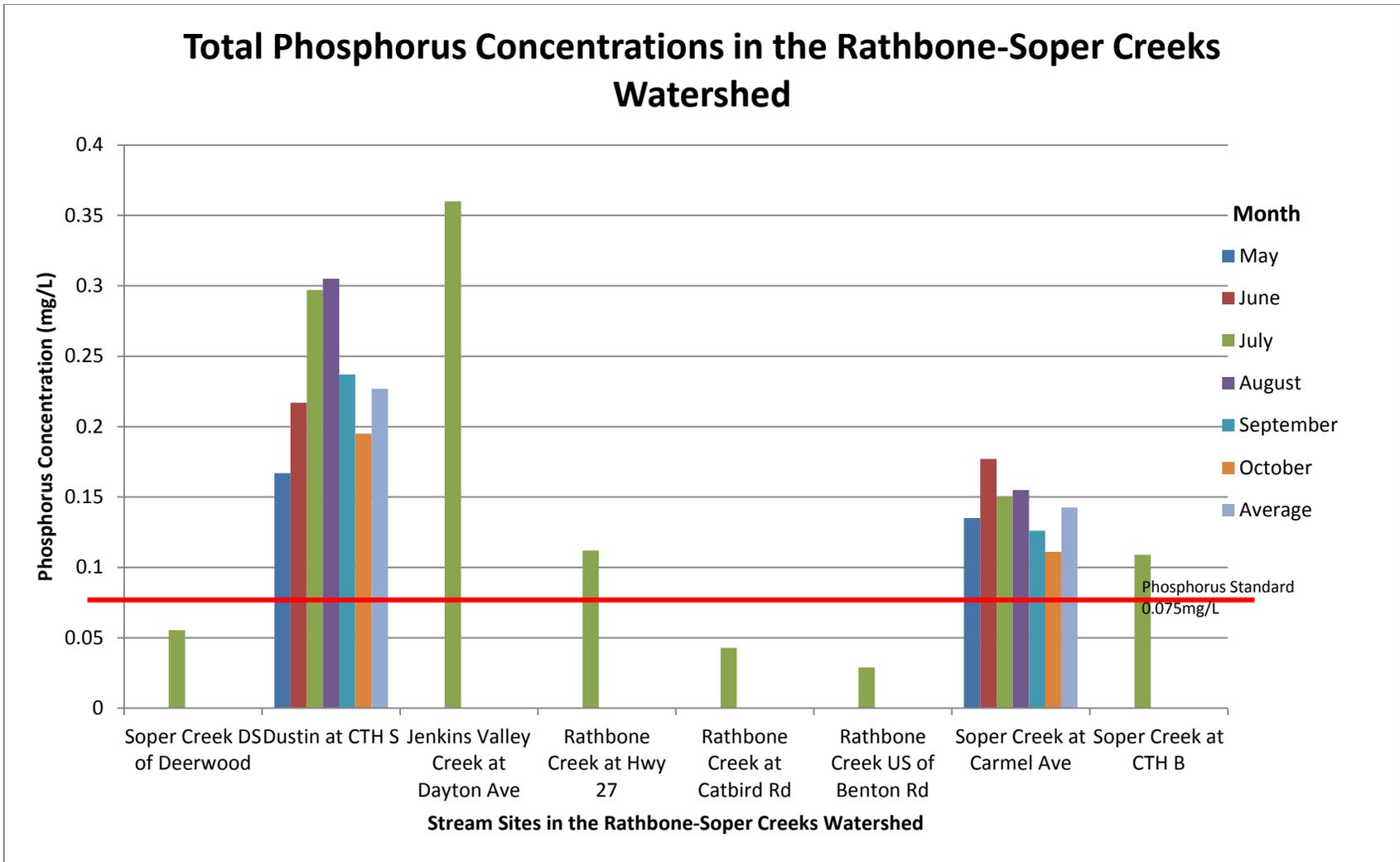


Figure 8: Graph showing monthly and average growing season total phosphorus concentrations in the Rathbone-Soper Creeks Watershed with the statewide phosphorus standard (0.075mg/L) shown in red.

Discussion

River/Stream Health

A watershed's fishery is a long-term gauge of conditions in the stream and is therefore most important for bioassessment. That's not to say measured water temperatures aren't useful, but for natural community determination and IBI purposes, and in the absence of moderate to severe environmental perturbation, the fishery assemblage trumps water temperature data (Lyons, personal communication).

Natural Community Analysis

Most of the streams in the Big-Douglas Creeks HUC 10 are modelled to be coldwater or cool-cold headwaters or mainstems (Lyons, 2008). The department has recently developed a method to determine if the modeled natural community is accurate based on the fishery assemblage and climate conditions (Lyons, 2013). In most cases, the thermal composition of species (cold, warm, or transitional) indicated these streams were generally modeled correctly. The streams in the Rathbone-Soper Creeks HUC 12 were also modelled to be coldwater or cool-cold headwaters or mainstems (Lyons, 2008). All stream sites surveyed for fish were verified to agree with the model in this subwatershed.



**Soper Creek at Carmel Fish Shocking
Photo by Kurt Rasmussen**

Fish Species Found

There were fifteen species found within the entire Big-Douglas Creeks HUC 10 watershed, which are shown in Figure 9. The two fish species most commonly found throughout the streams in this watershed were brook trout and burbot. Brook trout prefer cool, clear, headwater streams (Becker, 1983). Burbot are accustomed to spending time in cool waters of large rivers, or their tributaries (Becker, 1983). Of the fifteen species present, three were intolerant, four were tolerant, and eight were intermediate species.

In the Rathbone-Soper Creeks HUC 12 subwatershed, nine species of fish were found throughout the eight sites that were surveyed, which are shown in Figure 10. The two fish species most commonly found throughout the streams in this subwatershed were brook trout and central mudminnows. The central mudminnow prefers pools or areas with no or slow flowing waters and areas that are moderately to densely vegetated (Becker, 1983). Of the nine species found, two were intolerant, four were tolerant, and three were intermediate.

Index of Biological Integrity Findings

The fishery is only one indicator and for this reason, the quality of the resources should be looked at in the context of overall conditions including habitat and macroinvertebrates. The cool water IBIs (Lyons, 2012), when applied to the natural community indicated by the fishery assemblage, rates the fishery of these systems to be "poor" to "excellent", which is shown in Figure 5. There were ten of the twenty-seven total sites that did not have a FIBI rating because there were too few fish collected to be able to

calculate a score.. Twelve of the twenty-seven sites were “good” to “excellent,” which indicates that there is suitable habitat and adequate water quality conditions in about half of the stream sites.

Macroinvertebrate Data

Macroinvertebrate data is also useful in characterizing stream conditions and the sites sampled are shown in Figure 6. The sites in the Big-Douglas and Rathbone-Soper Creeks watersheds had macroinvertebrate IBI values ranging from “fair” to “excellent.” The macroinvertebrate IBI scores did not always correlate with the habitat scores and at some sites the macroinvertebrate IBI was “good” or “excellent” and the associated habitat was “poor” or “fair.” Local stressors may be influencing the macroinvertebrate communities in these areas.

Habitat Scores

Habitat scores throughout all sites surveyed generally ranged from “poor” to “good,” with only one site in the Rathbone-Soper subwatershed having a rating of “excellent,” which could be due to the habitat restoration work that was performed at this site in the past. The main limitations to habitat were fine sediment deposition, bank erosion, and lack of fish cover and complex stream characteristics, such as riffles and deeper **Phosphorus Concentrations**

Growing season phosphorus concentrations varied amongst the streams and the sites (Figures 7 and 8). The department’s listing methodology for impaired waters (WDNR, 2013) recommends listing sites where the median phosphorus concentration exceeds 0.075 mg/l on wadeable streams and 0.1 mg/l on rivers. The impairment listing protocol uses a 90% confidence interval about the median for listing streams and rivers. All five sites in the Big-Douglas Creeks watershed that had growing season phosphorus concentrations collected were higher than the wadeable statewide standard (Figure 7). This is consistent with the existing 303(d) impaired waters listing for each of the following streams: Big Creek, Davis Creek, Douglas Creek, Roaring Creek, and Sand Creek. Eight sites were sampled for phosphorus in the Rathbone-Soper Creeks subwatershed (Figure 8). Growing season phosphorus sampling on Soper Creek confirms the existing 303 (d) impaired waters listing.

Dustin Creek had a median growing season phosphorus concentration of 0.22 mg/L, which is higher than the 0.075 mg/L standard and this stream may be proposed for impairment listing in the next cycle due to nutrient criteria exceedances. Of the three grab phosphorus samples collected on Rathbone Creek, two were below the standard and one exceeded the standard. Additional growing season phosphorus sampling should be conducted on Rathbone Creek to get a more complete representation of phosphorus concentrations. A single grab total phosphorus sample on Jenkins Valley Creek was also higher than the statewide phosphorus standard and additional growing season sampling will be needed to assess for phosphorus exceedance.
pools.

Species	Big at Acorn	Burr Oak at Farm Rd	Davis at Stetzer	Douglas at STH 54	Douglas at Vinger	Mill at Sandburg	N Branch Douglas at W Bolger	Printz at Acorn	Roaring at CTH H	Roaring at Cutoff	Sand at DNR	Sand at Hwy 108	Sand at Sommers	Spencer at Canary	Spencer at Hwy 71	Unnamed at STH 54	White at CTH N	Wilson at Hwy 54	Woodward at Selmer
Brook trout	18		12	1	22		11	1			11	1	30	40	11				
White sucker	11												20						6
Western blacknose dace	14									15									1
Johnny darter	5	189							21	13		3							
Burbot	14		36								1	30	1	4		2		20	
Lamprey Ammocoete	3			2								3		6					
Central mudminnow	2			8							1	25		2					
Longnose dace	1											1							
Brown trout				1															
Largemouth bass				2	7														
Brook stickleback				35					17	13				3	10				
Northern pike											3	15							2
Rainbow darter												1							
Sand shiner																3			
Spotfin shiner																			1

Figure 9: Table showing the fish species present within the Big-Douglas Creeks HUC10 watershed. (Orange= intolerant species, purple= tolerant species, blue= intermediate species).

Species	Soper DS of Deerwood	Dustin at CTH S	Jenkins Valley at Dayton	Rathbone at Hwy 27	Rathbone at Catbird	Rathbone US of Benton	Soper at Carmel	Soper at CTH B
Brook trout	36		5	3	65	23	61	53
Western blacknose dace	12						11	2
Am brook lamprey (ammocoetes)	2			24	1		3	4
Central mudminnow	9		1	3	7	1	2	
Brook stickleback			5	10	8	3		
Johnny darter				42	3		13	1
Burbot							9	8
Longnose dace							1	
White sucker								2

Figure 10: Table showing fish species present within the Rathbone-Soper Creeks HUC12 subwatershed. (Orange= intolerant species, purple= tolerant species, blue= intermediate species).

Management Actions

Management Goals

It is a priority to work with the landowners and Jackson, Monroe, and La Crosse County staff to educate landowners and install BMPs in any agricultural areas that will help protect the water quality and maintain good stream health in the watersheds. It is important to continue work with landowners to prevent erosion of banks and deter fine sediments from entering streams by increasing and improving riparian areas. Encouraging stabilization of banks with vegetated buffers planted in grasses and forbs will help prevent erosion, act as natural cover for fish, and reduce sediment and nutrients flowing to the streams. Managed grazing, rotational grazing, and stream crossings should be considered in the riparian corridors to help mitigate bank erosion and trampling and protect riparian areas. In row cropped areas, buffers, cover crops, no-till farming and implementation of nutrient management plans would help reduce bank erosion and runoff of sediment and nutrients to the streams.

Monitoring and Assessment Recommendations

- Phosphorus monitoring is important to determine stream health and condition and should be conducted as funding and volunteer efforts allow.
- Dustin Creek should be considered for listing in the next 303(d) cycle due to exceedances of the total phosphorus criteria.
- Rathbone and Jenkins Valley Creeks should have more phosphorus monitoring completed in order to determine if the phosphorus criteria is exceeded within those streams.
- Follow up monitoring should be completed on streams with poor IBI scores or lack of fish to further evaluate conditions.

Management Recommendations for DNR

- DNR should work on outreach efforts with landowners and County conservation staff to increase the size and condition of riparian areas in order to buffer stream systems, create fish habitat, and decrease the amount of fine sediments entering the streams.
- Habitat improvements could also be implemented on streams that have documented steep eroding banks if funding becomes available.
- Continue monitoring water quality parameters or coordinate for volunteers to monitor streams that may have high phosphorus levels that exceed statewide criteria.

Management Recommendations for External Partners

- Several stream sites throughout the Big-Douglas watershed and Rathbone-Soper subwatershed have banks that are highly eroded. Grant programs and funding opportunities to seek BMP support should be pursued as relevant in the future.
- Educating landowners on stream bank protection is a crucial factor in protecting stream resources and funds may be available for agricultural landowners to implement BMPs to help protect stream banks and reduce upland soil erosion.
- In areas with heavy grazing, managed grazing and rotational grazing could be implemented to protect riparian corridors. Other agricultural practices such as buffers, cover crops, no-till farming, and nutrient management plans could help reduce erosion and runoff to streams.
- Citizen volunteers can also help by monitoring streams for phosphorus concentrations to identify areas that may need more nutrient reduction practices.
- Perched culverts and improperly constructed stream crossings are a barrier to aquatic organism movement. Land-owners, municipalities, and local units of government should work with DNR to

look for opportunities to improve fish passage during replacement of existing culverts and stream crossings. This helps ensure their projects use the appropriate best management practices to meet minimum state water quality standards.

Appendix A: References

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Appendix B: Stream Narratives

Unnamed Creek

WBIC: 1689100

(Overview) Unnamed Creek in the Big and Douglas Creeks Watershed, is a 3.86 mile river that falls in La Crosse County. This river is a Class II Trout Water under the Fisheries Program. This river is managed for fishing and swimming and is currently not considered impaired.

Davis Creek

WBIC: 1689300

(Overview) Davis Creek, a tributary to the Black River, is a Class II trout stream. This creek may attain Class I status if streambank erosion caused by livestock pasturing was reduced. Reducing flood flows would also improve the in-stream habitat available for fish and aquatic insects.

(Impaired Water) Davis Creek was assessed during the 2016 listing cycle; total phosphorus sample data overwhelmingly exceed 2016 WisCALM listing thresholds for the Fish and Aquatic Life use, however, available biological data do not indicate impairment (i.e. no macroinvertebrate or fish Index of Biotic Integrity (IBI) scored in the "poor" condition category).

Douglas Creek

WBIC: 1691

(Overview) Douglas Creek, which flows toward the Black River from the north, is a Class I and II trout stream upstream of Melrose. The dam that created Douglas Pond in Melrose was removed in 1990. This stream should be surveyed for fish and habitat to determine the effects of dam removal. Intensive grazing of the streambanks has degraded the habitat and water quality of Douglas Creek (Talley).

(Impaired Water) Douglas Creek was assessed during the 2016 listing cycle; total phosphorus sample data overwhelmingly exceed 2016 WisCALM listing thresholds for the Fish and Aquatic Life use, however, available biological data do not indicate impairment (i.e. no macroinvertebrate or fish Index of Biotic Integrity (IBI) scored in the "poor" condition category).

Mill Creek

WBIC: 1688500

(Overview) Mill Creek, a Black River tributary, is classified as a warm water forage fishery but the upper half has the potential to become a trout stream. The Melrose Rod and Gun Club annually stocks the stream with trout. Cropland runoff and streambank grazing contribute to habitat problems in this stream.

North Branch Shake Hollow Creek

WBIC: 1692100

(Overview) The North Branch Douglas Creek only runs for about four miles before it joins the main stem of Douglas Creek near Melrose, Jackson County. From its mouth to a little over a mile upstream the creek is classified as a Class II Trout water. The rest of the stream to its headwaters is classified as a Class I Trout water.

Printz Creek

WBIC: 1693100

(Overview) Printz Creek is a three-mile long tributary to Big Creek near Little Falls, Monroe County. Its current use is listed as a Warm Water Forage Fishery, but its attainable use is considered to be a Class I Trout water. Printz Creek was last monitored in 2010 and is in poor general condition and suffers from a degraded habitat from Total Suspended Solids (Sediments).

Roaring Creek**WBIC:** 1695200

(Overview) Roaring Creek, a tributary to the Black River, contains forage fish and stocked trout. The Melrose Rod and Gun Club annually stock brook trout in this stream. Some carryover of trout in the upper half of the stream has been observed. Streambank grazing, which induces erosion, is thought to contribute to the lack of in-stream habitat for trout.

(Impaired Water) Roaring Creek was assessed during the 2016 listing cycle; total phosphorus sample data overwhelmingly exceed 2016 WisCALM listing thresholds for the Fish and Aquatic Life use, however, available biological data do not indicate impairment (i.e. no macroinvertebrate or fish Index of Biotic Integrity (IBI) scored in the "poor" condition category).

Sand Creek**WBIC:** 1689700

(Overview) Sand Creek, a Black River tributary, is a high quality Class I trout stream containing brook trout. Below HWY 108, Sand Creek contains sport fish. Adjacent lands are primarily wooded with stands of old growth timber. Streambank grazing and cropland erosion negatively affect the La Crosse County portion of Sand Creek (Wright). This stream has good water quality and potential for fishery habitat improvement. The DNR designated a corridor surrounding Sand Creek for streambank protection via land purchase. Through this program, the DNR has acquired approximately 715 acres surrounding approximately one and a half miles of Sand Creek. In-stream habitat structures were installed and prairie and oak savannah restoration efforts began in 1997 on a newly acquired one square mile piece of land. The prairie will be maintained by periodic burning. Preliminary endangered resource inventory work was done on the property. More detailed information should be collected for both aquatic and terrestrial species.

(Impaired Water) Sand Creek was assessed during the 2016 listing cycle; total phosphorus sample data overwhelmingly exceed 2016 WisCALM listing thresholds for the Fish and Aquatic Life use, however, available biological data do not indicate impairment (i.e. no macroinvertebrate or fish Index of Biotic Integrity (IBI) scored in the "poor" condition category).

Spencer Creek**WBIC:** 1693300

(Overview) Spencer Creek, a tributary to Big Creek, is a Class I trout stream from the mouth to Hwy 71, then Class II upstream of Hwy 71 for 1.5 miles. Most of Spencer Creek is within the Big Creek State Fishery Area, but only two tracts of land are in state ownership. Localized bank erosion due to pasturing of streambanks contributes sand to the stream. The Class II portion of this stream has the potential to become Class I trout if in-stream habitat improved.

Unnamed Creek**WBIC:** 1690100

(Overview) Unnamed Creek, in the Big and Douglas Creeks Watershed, is a 4.66 mile river that falls in Jackson County. This river is managed for fishing and swimming and is currently not considered impaired.

White Creek**WBIC:** 1691700

(Overview) White Creek is a three-mile long tributary to Douglas Creek near Melrose, Jackson County. Its current use is listed as a Warm Water Forage Fishery, but its attainable use is considered to be a Class III Trout water. White Creek was last monitored in 2007 and is in poor general condition due to Total Suspended Solids (Sediment) degrading the habitat.

Wilson Creek, WBIC: 1688300

(Overview) Wilson Creek is a four-mile long tributary to the Black River near North Bend, Jackson County. The creek was last monitored in 2010, but its general condition remains unknown.

Woodward Creek, WBIC: 1691900

(Overview) Woodward Creek is a four-mile long tributary to Douglas Creek in the township of Irving, Jackson County. Its current use is listed as a Warm Water Forage Fishery, but its attainable use is considered to be a Class III Trout water. Woodward Creek was last monitored in 2007 and is in poor general condition due to Total Suspended Solids (Sediment) degrading the habitat.



Brook Trout, Soper Creek
Kurt Rasmussen, Photographer



Soper Creek at Deerwood
Junction
Kurt Rasmussen, Photographer



Rathbone Creek downstream
from Benton Road at DNR
property Temp Logger, Kurt
Rasmussen, Photographer

Appendix C: Monitored Stations

WBIC	Waterbody Name	Station ID	Station Name	Earliest Fieldwork Date	Latest Fieldwork Date
1676700	Black River	273022	Black River at Hwy 108 Bridge	07/06/1989	10/20/2015
1694300	Dustin Creek	10013049	Dustin Creek St. 2 - 2005 Cty Hwy S	09/14/2010	10/01/2015
1689100	Unnamed	10044139	Unnamed Creek (WBIC 1689100) - Hwy 108 & Hwy Q in Burr Oak	09/02/2015	09/02/2015
5556483	Unnamed	10012402	Shaid No 1003298	08/22/2009	06/27/2015
1693400	Soper Creek	10020470	Soper Creek St. 1 Carmel Ave. Crossing	05/11/2014	01/01/2015
1695200	Roaring Creek	10029406	Roaring Creek at Cutoff Road	10/01/2003	01/01/2015
1689700	Sand Creek	10008574	Sand Creek At Hwy 108	05/27/2014	01/01/2015
1691300	Douglas Creek	10020580	Douglas Creek at Sth 54	06/13/2007	01/01/2015
1692900	Big Creek	423224	Big Creek at Acorn Ave	07/18/2005	01/01/2015
1689300	Davis Creek	10029578	Davis Creek St. at Stetzer Rd	05/27/2014	01/01/2015
1689700	Sand Creek	10008571	Sand Creek Station Sommers Rd.	06/03/2008	10/29/2014
1688500	Mill Creek	10015333	Mill Creek - Sandburg Rd Xing	10/22/2008	10/29/2014
1689700	Sand Creek	10034988	Sand Cr north DNR parking lot down hill trail to water	08/07/2014	10/29/2014
1689100	Unnamed	10014028	Creek 2-1(Burr Oak Creek)Station 2-1958-Nw 1/4 Nw 1/4 S12-Starts At Farm Road Bridge Crossing.	08/14/2014	10/29/2014
1688300	Wilson Creek	10015345	Wilson Creek - Hwy 54	09/04/2014	10/29/2014
1690100	Unnamed	10042759	Unnamed Trib (1690100) to Black R at STH 54	09/04/2014	10/29/2014
1693300	Spencer Creek	10020519	Spencer Creek St. 5 Hwy 71 Crossing	08/05/2014	10/29/2014
1691300	Douglas Creek	10032012	Douglas Creek at Vinger Road	11/09/2010	10/28/2014
1693300	Spencer Creek	10020516	Spencer Creek St. 2 Canary Ave. Crossing	08/07/2014	10/28/2014

WBIC	Waterbody Name	Station ID	Station Name	Earliest Fieldwork Date	Latest Fieldwork Date
1695200	Roaring Creek	10029407	Roaring Creek at CTH H	10/22/2008	10/28/2014
1692100	North Branch Douglas Creek	10042760	North Branch Douglas Creek at West Bolger Rd	07/24/2014	10/28/2014
1691700	White Creek	10021699	White Creek Upstream Cth N	10/03/2007	10/28/2014
1693100	Printz Creek	10030734	Printz Creek at Acorn Ave	11/23/2009	10/28/2014
1691900	Woodward Creek	10021698	Woodward Creek Downstream Selmer Road (Farthest Downstream Crossing)	10/03/2007	10/28/2014
1693400	Soper Creek	10013798	Soper Creek Station 1 - Driveway Crossing Near Cth B	02/13/2008	10/09/2014
1693400	Soper Creek	10020467	Soper Creek St. 7 300ft Downstream Of Deerwood Rd.	07/02/2014	10/09/2014
1694000	Rathbone Creek	10009054	Rathbone Creek #1- Hwy 27 Bridge	02/21/2006	10/09/2014
1694000	Rathbone Creek	10013043	Rathborne Creek St. 2 -2005 State Land Just Upstream Of Benton Road	07/02/2014	10/09/2014
1693500	Jenkins Valley Creek	10020619	Jenkins Valley Creek at Dayton Avenue	04/26/2007	10/09/2014
1676700	Black River	10042348	Black River 2.2mi E of Hwy 71 near Melrose	09/18/2014	09/18/2014
1689300	Davis Creek	10013924	Davis Creek Station 2 - Hwy 108 Bridge Crossing	09/09/2014	09/09/2014
1694000	Rathbone Creek	10009055	Rathbone Creek #2- Benton Rd. Bridge	10/23/2001	08/06/2014
1693400	Soper Creek	10020478	Soper Creek St. 8 Appro. 5344ft Upstream Of Cth B	08/05/2014	08/05/2014
1694000	Rathbone Creek	10017334	Rathbone Creek St. 1 Cataract Pond Upstream	07/24/2014	08/05/2014
1691500, 1691300	Douglas Creek, Douglas Pond	10015332	Douglas Creek - Hogg Road Bridge (Site Of Old Mill Pond)	10/16/2011	05/10/2014
1689300	Davis Creek	10013925	Davis Creek Station 3 - Davis Creek Road Bridge Crossing	06/03/2008	10/29/2013
1693100	Printz Creek	10030733	Printz Creek at Aaron Ave	11/23/2009	11/01/2012
1688200	Black River -Un Slough	10018552	Black River -- North Bend Access	06/05/2012	06/05/2012
5556438	Unnamed	10012403	Shaid No 1003288	08/22/2009	08/03/2011

WBIC	Waterbody Name	Station ID	Station Name	Earliest Fieldwork Date	Latest Fieldwork Date
1687800	Horseshoe Lake	10002975	Horseshoe Lake	08/29/2000	08/03/2011
1691300	Douglas Creek	273122	Douglas Creek - Douglas Cr At Cth H	10/12/1999	11/09/2010
5024207	Unnamed	10040488	Dustin Creek at Big Creek Fisheries in Cataract	05/03/2005	09/29/2010
5556703	Unnamed	10036586	Unnamed Lake	09/26/2010	09/26/2010
1667900	Stevens Lake	10002970	Stevens Lake	08/29/2000	09/26/2010
5557156	Unnamed	10035086	Unnamed Lake	09/26/2010	09/26/2010
1691000	Shallow Lake	10004124	Shallow Lake	08/29/2000	09/26/2010
5587308	Unnamed	10035986	Unnamed Lake	09/26/2010	09/26/2010
1692800	Horse Shoe Lake	10002976	Horse Shoe Lake	08/29/2000	09/26/2010
1690700	Mud Lake	10004122	Mud Lake	08/29/2000	09/26/2010
5556690, 5024230	Unnamed	10035357	Unnamed - Area of Open Water	06/29/2010	09/26/2010
1687400	Black River -South Channel	10035558	Black River -South Channel - Area of Open Water	06/29/2010	09/26/2010
5556657	Unnamed	100504	Unnamed - WBIC 5556657	08/10/2008	06/29/2010
1689300	Davis Creek	10039596	Davis Creek near Davis Creek Rd and STH 108	10/27/2009	05/12/2010
1693100	Printz Creek	10031126	Printz Creek 50m DS from Aaron Ave	04/12/2010	04/12/2010
1693100	Printz Creek	10031128	Spring discharge to Printz Creek	04/12/2010	04/12/2010
1688300	Wilson Creek	10031069	Wilson Creek at Patterson Road	03/19/2010	03/19/2010
1690100	Unnamed	10031074	Unnamed Creek - West Indies	03/19/2010	03/19/2010
1688300	Wilson Creek	10031068	Wilson Creek at Johnson Road	03/19/2010	03/19/2010
1688300	Wilson Creek	10030405	Wilson Creek 1/2 mile upstream from Black River	05/02/2009	07/28/2009
1688300	Wilson Creek	10029993	Wilson Creek downstream from barnyard	05/07/2009	05/07/2009
1688300	Wilson Creek	10017417	Wilson Creek At Upper Most Cth V Crossing	04/25/2007	05/07/2009
1688500	Mill Creek	10016970	Mill Creek - West Indies Rd 10 Feet Downstream From culvert	11/14/2002	10/22/2008
1667500	Ketchum Lake	100602	Ketchum Lake	08/19/2008	08/19/2008

WBIC	Waterbody Name	Station ID	Station Name	Earliest Fieldwork Date	Latest Fieldwork Date
1690800	Deep Lake	10004123	Deep Lake	08/29/2000	08/19/2008
5023520	Unnamed	10039690	Unnamed Creek (Mill Creek) NW of W Indies Rd and South Rd	01/03/2008	05/25/2008
1691900	Woodward Creek	10021697	Woodward Creek Upstream Cth N	10/03/2007	10/03/2007
1691700	White Creek	10021700	White Creek Upstream Sth 54 (Farthest Downstream Crossing)	10/03/2007	10/03/2007
1693500	Jenkins Valley Creek	10014212	Jenkins Valley Creek Station 1 - Junction With Soper Creek Upstream	11/01/2006	04/26/2007
1694300	Dustin Creek	10014017	Dustin Creek Station 3-1976-Nw 1/4 Sw 1/4 S18-Starts At Benton Road Bridge Crossing.	11/01/2006	11/01/2006
1689900	Unnamed	10020863	Creek 34-13 St. 3 Line Fence Betw. Ne1/4 Nw1/4 of Sw S35	10/30/2006	10/30/2006
1691900	Woodward Creek	10021434	Woodward Creek - Upstream From Bolger	10/05/2006	10/05/2006
1690200	Unnamed	10015330	Unnamed Creek -West Indies Rd (2nd Xing Going West)	10/05/2006	10/05/2006
1689700	Sand Creek	10029768	Sand Creek Section34 SE of NW	07/29/2004	10/23/2005
1676700	Black River	10042189	Black River downstream of Hwy 108 to W. Jackson Co. line	09/20/2001	09/21/2005
1693400	Soper Creek	423216	Soper Creek - Soper Creek	06/23/2003	10/14/2004
1692900	Big Creek	423217	Big Creek - Big Creek	06/23/2003	10/14/2004
1676700	Black River	10029636	BLACK RIVER NORTH BEND	07/07/2004	07/07/2004
1688500	Mill Creek	10016608	Mill Creek - Sandberg Rd 20 Feet Downstream From bridge Crossing	11/14/2002	11/14/2002
1676700	Black River	10042188	Black River downstream of Irving to Hwy 108	09/19/2001	09/26/2001
1691300	Douglas Creek	10015779	Douglas Creek - 40 Ft Upstream Of Bridge On Cth H	10/27/1999	10/27/1999
1676700	Black River	275006	Black River - Exact Location Unknown	08/19/1992	08/19/1992
1676700	Black River	273023	Black River - Below Melrose Potw	07/06/1989	04/04/1990
1691500	Douglas Pond	999209	Douglas Pond - Deep Hole	06/03/1989	08/06/1989

Appendix D: Watershed Reportⁱ

WBIC	Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Designated Use	Impairments	Sources	Assessment	Impaired Status
1667500	Ketchum Lake	0	1.63	Small	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1667900	Stevens (Miller, Stebbs) Lake	0	12	Shallow Headwater	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1676700	Black River	0	37.01	FAL	FAL	Not Supporting	Default FAL	Impairment Unknown	Non-Point Source	Monitored	303d Listed
1676700	Black River	37.01	73.36	FAL	FAL	Not Assessed	Default FAL	NA	NA	Monitored	Pollutant Removed, 303d Listed
1686900	Hardies Creek	0	1.64	WWFF	Cold (Class II Trout)	Not Supporting	Default FAL	Degraded Habitat	Non-Point Source	Monitored	TMDL Approved
1687800	Horseshoe Lake	0	12.59	Shallow Seepage	FAL	Supporting	Default FAL	NA	NA	Monitored	NA
1688300	Wilson Creek	0	4	FAL	FAL	Fully Supporting	Default FAL	NA	NA	Monitored	NA
1688500	Mill Creek	0	2.5	FAL	FAL	Not Assessed	Default FAL	NA	NA	No Assessment on File	NA
1688500	Mill Creek	2.5	5.46	WWFF	Cold (Class II Trout)	Not Supporting	Default FAL	Degraded Habitat	Non-Point Source	Evaluated: Older Data	303d Listed
1689300	Davis Creek	0	6.86	Cold (Class II Trout)	Cold (Class II Trout)	Not Supporting	Cold	Water Quality Use Restrictions	Non-Point Source	Monitored	303d Listed
1689700	Sand Creek	0	10.21	Cold (Class I Trout)	Cold (Class I Trout)	Not Supporting	Cold	Water Quality Use Restrictions	Non-Point Source (Rural or Urban)	Monitored	303d Listed
1689900	Creek 19n, 5w, 34nese	0	4.47	Cold (Class I Trout)	Cold (Class I Trout)	Supporting	Cold	NA	NA	Monitored	NA
1690100	Local Water	0	4.66	FAL	FAL	Supporting	Default FAL	NA	NA	Monitored	NA

WBIC	Local Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Designated Use	Impairments	Sources	Assessment	Impaired Water Status
1690700	Mud Lake	0	13	Shallow Headwater	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1690800	Deep Lake	0	14.19	Deep Headwater	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1691000	Shallow Lake	0	22.29	Shallow Headwater	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1691300	Douglas Creek	0	1.75	FAL	Cold	Not Supporting	Default FAL	Water Quality Use Restrictions	Non-Point Source	Monitored	303d Listed
1691300	Douglas Creek	2.06	4.12	Cold (Class II Trout)	Cold (Class II Trout)	Not Supporting	Cold	Water Quality Use Restrictions	Non-Point Source	Monitored	303d Listed
1691300	Douglas Creek	4.13	9.99	Cold (Class I Trout)	Cold (Class I Trout)	Not Supporting	Cold	Water Quality Use Restrictions	Non-Point Source	Monitored	303d Listed
1691500	Douglas Pond	0	20.24	Impounded Flowing Water	FAL	Not Assessed	Default FAL	NA	NA	No Assessment on File	NA
1691700	White Creek	0	3.1	WWFF	Class III Trout	Not Supporting	Default FAL	Degraded Habitat	Non-Point Source Streambank Modifications/d establization	Monitored	303d Listed
1691900	Woodward Creek	0	4	WWFF	Class III Trout	Not Supporting	Default FAL	Degraded Habitat	Non-Point Source Streambank Modifications/d establization	Evaluated: Older Data	303d Listed
1692600	Kunes Creek	0	2	FAL	FAL	Not Assessed	Default FAL	NA	NA	No Assessment on File	NA

WBIC	Local Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Designated Use	Impairments	Sources	Assessment	Impaired Water Status
1692800	Horse Shoe Lake	0	29	Shallow Seepage	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1692900	Big Creek	0	1.49	Cold (Class II Trout)	Cold (Class II Trout)	Not Supporting	Cold	Water Quality Use Restrictions	Non-Point Source (Rural or Urban)	Monitored	303d Listed
1692900	Big Creek	1.49	6.49	Cold (Class II Trout)	Cold (Class II Trout)	Not Supporting	Cold	Water Quality Use Restrictions	Non-Point Source (Rural or Urban)	Monitored	303d Listed
1692900	Big Creek	6.66	6.77	Cold (Class I Trout)	Cold (Class I Trout)	Not Assessed	Cold	NA	NA	No Assessment	NA
1693000	Fisher Creek	0	2	FAL	WWSF	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1693100	Printz Creek	0	3.06	WWFF	Cold (Class I Trout)	Not Supporting	Default FAL	Degraded Habitat	Livestock Non-Point Source (Rural or Urban)	Monitored	303d Listed
1693300	Spencer Creek	0	3.22	Cold (Class I Trout)	Cold (Class I Trout)	Not Assessed	Cold	NA	NA	No Assessment on File	NA
1693300	Spencer Creek	3.22	6.55	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	Cold	NA	NA	No Assessment on File	NA
1693400	Soper Creek	0	7.97	Cold (Class I Trout)	Cold (Class I Trout)	Not Supporting	Cold	Impairment Unknown	Non-Point Source	Monitored	303d Listed
1693500	Jenkins Valley Creek	0	4.16	Cold (Class II Trout)	Cold (Class II Trout)	Fully Supporting	Cold	NA	NA	Monitored	NA
1694000	Rathbone Creek	0	6.2	Cold (Class II Trout)	Cold (Class II Trout)	Not Assessed	Cold	NA	NA	No Assessment	NA
1694200	Cataract Pond	0	5	Small	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1694300	Dustin Creek	0	3.68	Cold (Class I Trout)	Cold (Class I Trout)	Fully Supporting	Cold	NA	NA	Monitored	NA

WBIC	Local Waterbody Name	Start Mile	End Mile	Current Use	Attainable Use	Supporting Attainable Use	Designated Use	Impairments	Sources	Assessment	Impaired Water Status
1695100	Wolf Creek	0	3	FAL	FAL	Not Assessed	Default FAL	NA	NA	No Assessment	NA
1695200	Roaring Creek	0	5.34	WWFF	Cold (Class II Trout)	Not Supporting	Default FAL	Water Use Restrictions, Degraded Habitat	Livestock Non-Point Source	Monitored	303d Listed
1695300	Black Slough	0	2	FAL	WWSF	Not Assessed	Default FAL	NA	NA	No Assessment	NA
5023520	Mill Creek	0	0.96	FAL	FAL	Not Assessed	Default FAL	NA	NA	Not Assessed	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.