Black Otter Creek
Nonpoint Source Assessment Report

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January, 1994

I. INTRODUCTION

Monitoring was conducted in 1991 and 1992 in Black Otter Creek to determine its existing conditions and impacts on water quality from nonpoint source pollution. Black Otter Creek is a tributary to the Wolf River in the Wolf River/New London and Bear Creek Watershed in the Wolf River basin. Black Otter Creek drains 20 square miles in southwest Outagamie County where it flows northward through the village of Hortonville. In Hortonville, the creek is dammed to form the 75-acre Black Otter Lake.

Historical data for Black Otter Creek including Black Otter Lake, can be found in the WDNR, Lake Michigan District water quality and lake management files. Several extensive studies have been done in the past and should be referred to before re-evaluating the ranking of this watershed for potential selection as a Priority Watershed project.

II. METHODS AND PROCEDURES

Stream habitat conditions were evaluated at seven locations on Black Otter Creek in the spring and fall and recorded on the Stream Habitat Evaluation Form (Ball, 1982).

Aquatic macroinvertebrates were collected in spring and fall at three locations on Black Otter Creek. The samples were collected in a D-frame net, preserved in 70% alcohol then sent to UW-Stevens Point for sorting and identification. Sample results were evaluated using the Hilsenhoff Biotic Index which provides a relative measure of organic loading to the stream (Hilsenhoff, 1987).

III. RESULTS AND DISCUSSION

Figure 1 shows the location of monitoring sites on Black Otter Creek. A summary of habitat evaluation and biotic index results are presented in Table 1.

Black Otter Creek is a Warm Water Sport Fish Community classified stream. Land use in the upper reaches of the stream is primarily agriculture while below Hortonville the stream flows through some agricultural land before hardwood marsh.

FIGURE 1.

Wolf River/New London and Bear Creek (WR12-112) - *top* Arrowhead River and Daggets Creek (WR01-112) - *bottom* Watersheds

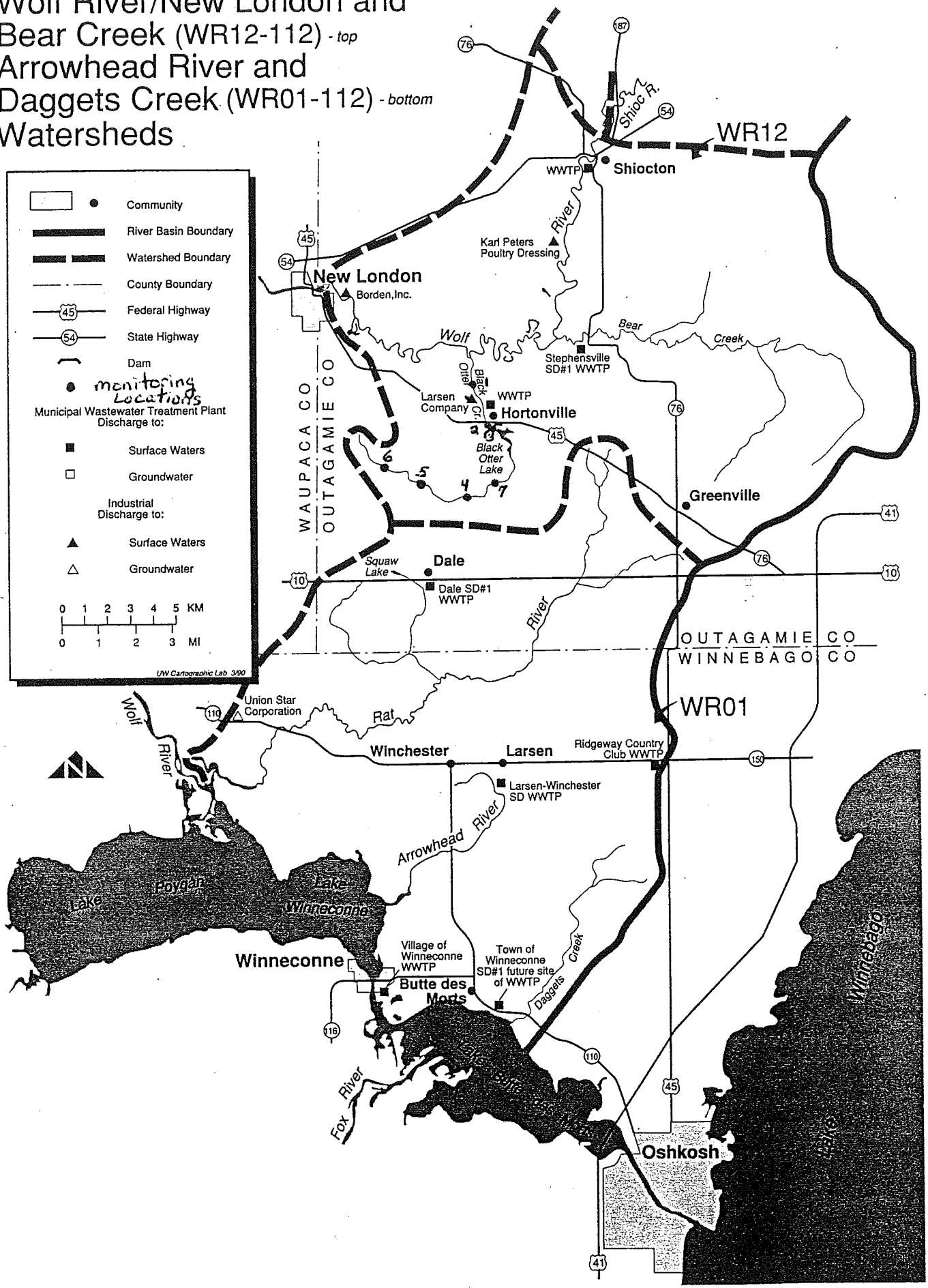

Table 1.

BLACK OTTER CREEK

Habitat Evaluation and Biotic Index Results

Fall 1991 & Spring 1992

Site #	Location	Habitat Evaluation[1] Fall	Habitat Evaluation[1] Spring	Biotic Index[2] Fall	Biotic Index[2] Spring
1	North Douglas St.	Fair/161	Fair/179	Very Poor/8.08	Poor/7.65
2	Miller Park	Poor/217	Poor/203	No macroinvertebrates Present	
3	South Mill St.	Fair/187	Fair/169	Fairly Poor/6.67	Fair/6.32
4	Midway Road	Poor/200	Fair/196	------	------
5	CTH "T"	No Water	Fair/190	------	------
6	Winchester Road	No Water	Poor/203	------	------
7	CTH "M"	Fair/195	Fair/145	Very Good/4.45	Good/4.81

1. Habitat Evaluation:

0-70	= Excellent
71-129	= Good
130-200	= Fair
>200	= Poor

2. Hilsenhoff Biotic Index:

Score	Water Quality	Degree of Organic Pollution
0-3.50	Excellent	No apparent organic pollution
3.51-4.50	Very Good	Possible slight organic pollution
4.51-5.50	Good	Some organic pollution
5.51-6.50	Fair	Fairly significant organic pollution
6.51-7.50	Fairly Poor	Significant organic pollution
7.51-8.50	Poor	very significant organic pollution
8.51-10.00	very Poor	Severe organic pollution

Upstream of Black Otter Lake

In the upper most reaches of Black Otter Creek, stream habitat and aquatic organisms are significantly limited by low flows. In October 1991, the creek bed was dry as far upstream as CTH T and therefore, could not be evaluated that fall.

The creek at Winchester Road and CTH T are very similar in appearance; However, at Winchester Road, the creek received a poor habitat rating while at CTH T the creek received a fair rating. The difference in rating is because of deeper water and more hard structure at CTH T. However at both locations, habitat has been degraded by ditching. Stream channelization eliminates the pool-riffle-run structures that are desirable for abundance and diversity of aquatic organisms. The stream substrate is predominantly sand with some silt and gravel present. Filamentous algae and macrophytes are common in the creek. The tall grasses along the streambanks make bank erosion uncommon, but there is potential for erosion during extreme floods.

The stream reach at Midway Road received poor and fair habitat ratings. The stream here is deep and narrow with gravel substrate in the middle of the creek but silt and muck on the edges. Riffles are absent and therefore, macroinvertebrate samples could not be collected. Springs feed the creek just downstream of Midway Road.

Just above CTH M, the stream is pastured and thus, has high potential for bank erosion during floods. Downstream of CTH M, the banks are generally protected from erosion with trees and shrubs with apparently a good root system. The creek bed is generally rock and gravel with good riffle areas. Macrophytes are significant.

Macroinvertebrate samples were collected in fall and spring at CTH M. Samples received a very good (4.45) rating in fall and a good (4.81) biotic index rating in spring. Very good indicates possible slight organic pollution while good indicates some organic pollution present. Riffle Beetles (Elmidae) and Midge larvae (Chironomidae) were the most abundant organisms present.

Downstream of Black Otter Lake

Directly below the dam outlet at South Mill Street, habitat was rated as fair. The artificial rocky substrate was completely covered by filamentous algae. Macroinvertebrate samples received a fairly poor (6.67) rating in fall and a fair (6.32) biotic index rating in spring. Fairly poor indicates significant organic pollution while fair indicates fairly significant organic

pollution present. Sowbugs (Asellidae) and Black Fly larvae (Simuliidae) were the most abundant organisms present.

A short distance downstream at Miller Park, habitat was rated as poor. The creek bed was mostly silt and sand. Filamentous algae covered what little hard substrate that was present. No macroinvertebrates could be found at this location probably because of the lack of quality substrate. Bank erosion was uncommon to nonexistent with 70-90% stable trees, shrubs, and grasses.

Further downstream at North Douglas Street, habitat was rated as fair. The creek is more narrow and deeper here then upstream. Silt was the most predominant substrate type, however, rock and rubble were present below the bridge where rip-rap was placed. Filamentous algae covered the substrate and crayfish were abundant. Stream bank erosion is infrequent. Thick growth of grasses border the creek. Macroinvertebrate samples received a very poor (8.08) rating in fall and a poor (7.65) biotic index rating in spring. Very poor indicated severe organic pollution while poor indicates very significant organic pollution present. Scuds (Talitridae) and Sowbugs (Asellidae) were the most abundant organisms present.

IV. CONCLUSIONS

Stream habitat evaluation and aquatic macroinvertebrate sample results generally indicate fair to poor conditions in Black Otter Creek. This is attributed to several factors. First, stream channelization has eliminated natural bends and meanders which would normally provide instream habitat. Secondly, the streams low flow, especially in the upper reaches, provide only intermittent habitat for organism. Thirdly, nutrient enrichment from nonpoint source runoff appears to have contributed to excessive filamentous algae and macrophyte growth in the creek and in Black Otter Lake. Lastly, Black Otter Lake has an effect on water quality downstream of the dam. Aquatic insect ratings were better upstream of the impoundment then downstream.

Nonpoint source control measures installed in this watershed could probably improve both instream conditions in the perennial portion of the creek above Black Otter Lake and lake quality; However, downstream conditions would not be expected to significantly improve because of the quality of the water released from the lake.

I concur with the current "medium" priority ranking for potential selection in the Nonpoint Source Priority Watershed program which this watershed received in the 1991 Wolf River Water Quality Management Plan.

V. REFERENCES

Ball, Joe, 1982. Stream Classification Guidelines for Wisconsin. Wisconsin Department of Natural Resources.

Hilsenhoff, William, 1987. An Improved Biotic Index of Organic Stream Pollution.

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