

**NONPOINT SOURCE APPRAISAL
TRIBUTARIES ENTERING THE NORTH SIDE OF STURGEON BAY CANAL**

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A brief appraisal was conducted for the tributaries on the north side of Sturgeon Bay that discharge to the Sturgeon Bay ship canal. The purpose of this appraisal was to determine nonpoint source impacts and the existing water quality conditions of these streams.

Surface water drainage in this area consists of two intermittent tributaries (Big Creek and Little Creek) and storm sewer outfalls from the city of Sturgeon Bay.

Previous water quality monitoring has been conducted on Big Creek. A description of the water quality conditions, current uses and watershed objectives for Big Creek can be found in the Upper Door Priority Watershed Project Nonpoint Source control Plan (1987).

However, supplemental appraisal monitoring was conducted in Big and Little Creek in the Fall of 1992 and Spring 1993 to further define existing conditions and nonpoint source impacts to these streams. This monitoring consisted of habitat evaluations, chemistry, and macroinvertebrate monitoring. (See Table 1).

BIG CREEK

Big Creek is a moderate grade intermittent stream east of Highways 57-42 that drains to an estuary of sturgeon Bay canal. A stream habitat evaluation was conducted on a stretch of stream near Utah Road. This reach received a score of 173 indicating "fair" habitat using the Stream System Habitat Rating Form (Ball, 1992). Rubble, gravel and boulders are the primary bottom material with some sand and silt deposition along banks and in pool areas. The macrophytes Coontail and Elodea are common in the stream and filamentous algae and periphyton is abundant on the rocks. This indicates excess productivity as a result of nutrients in the stream system.

Springs feed the lower reaches of Big Creek during low flow periods, but the creek receives a significant amount of surface runoff during snowmelt and rain events. This was evidenced by very turbid, stained water after rain events and low flow clear water otherwise.

Water chemistry samples collected November, 1992 shows only moderate concentrations of nutrients, biochemical oxygen demand, and suspended solids. However, bacteria counts were relatively high indicating runoff.

A macroinvertebrate sample collected in October, 1992 near Utah Road show sowbugs (Isopoda) and scuds (Amphipoda) to be the most abundant organisms present in the stream. These organisms are considered to be fairly tolerant to organic pollution. The Hilsenhoff Biotic Index (Hilsenhoff, 1982) value was calculated at 6.55, rating water quality as "fairly poor with significant organic pollution".

LITTLE CREEK

Little Creek is an intermittent drainage ditch that receives only urban runoff waters. This stream is very flashy in wet weather, but then completely dries up in summer. Several storm sewers discharge to this creek. Some of the creek is diverted to underground mains, but resurfaces before discharging to the canal.

A stream habitat evaluation on Little Creek near Utah Road received a score of 171 indicating "fair" habitat. Most of the creek substrate is rock, rubble, gravel, and sand; however, there is significant siltation in pool areas. Nutrients are causing thick mats of filamentous algae growth on the rock substrate. The stream is fairly well buffered with little streambank erosion.

CONCLUSION

The two tributaries entering the north side of the Sturgeon Bay canal are significantly impacted by nonpoint source pollution. Nutrients have caused excess macrophyte and algae growth in these streams. Sediments loadings have degraded stream habitat by filling in pool and rifle areas. Big Creek appears to be impacted by rural sources while Little Creek is only impacted by urban nonpoint sources. A reduction of sediment and nutrients in these streams would not only help protect instream habitat and water quality, but would also decrease pollutant loading to the Sturgeon Bay canal.

REFERENCES

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

Wisconsin Department of Natural Resources, 1987. A Nonpoint Source Control Plan for the Upper Door Priority Watershed Project.

Hilsenhoff, W. 1982. Using a Biotic Index to Evaluate Water Quality in Streams. Wisconsin Department of Natural Resources Technical Bulletin Number 132.

