

DATE: May 12, 2003

FILE REF: WIBC 16300

TO: Honey Creek (WIBC 16300) File

FROM: Will Wawrzyn SER

SUBJECT: Addendum to the Stream Classification and Stream Appraisal Report for Honey Creek, Menomonee River Watershed, Milwaukee River Basin, Milwaukee County

### Purpose

The purpose of this memorandum is to re-evaluate the previously assigned Stream Classification and recommendations for Honey Creek<sup>1</sup>.

### Location of Waterbodies

Honey Creek (WIBC 16300) is a tributary to the Menomonee River (WIBC 16000), Menomonee River Watershed, Milwaukee River Basin in Milwaukee County. The headwaters are formed by a storm sewer discharge in the SW1/4 of the NW1/4 of Section 25, T6N, R21E<sup>2</sup>. The stream flows north for approximately 10 miles before discharging to the Menomonee River in the NW1/4 of the NW1/4, Section 27, T7N, R21E<sup>3</sup>.

### Discussion

Habitat in Honey Creek is limited by extensive hydrological modifications, and degraded water quality and habitat attendant to urban storm water runoff. Approximately 3-miles of channel has been enclosed in storm sewer and an additional 1-mile has been placed in a concrete-lined invert. As a result of these hydrologic modifications, Honey Creek was previously classified on a reach by reach basis, with the 4-miles of hardened-engineered channels being classified as a *Limited Aquatic Life Community*. Stream reaches still contained in a natural alluvial channel were classified as a *Warmwater Forage Fish Community*. The attainability analysis portion of the stream classification report concluded that the hardened hydrological modifications and their impacts to the existing and potential biological use of Honey Creek were socially and technically irreversible<sup>1</sup>.

Since completion of the 1992 Stream Classification Report for Honey Creek, there have been significant changes in local flood management policy. Recent completion of major flood management projects in other watershed contained in the Milwaukee River Basin does necessitate re-consideration of the long-term biological use attainability analysis for Honey Creek.

The Milwaukee Metropolitan Sewerage District (MMSD) is the agency charged with flood management throughout Milwaukee County. Beginning in the mid-1960's the MMSD routinely practiced channelization, concrete lining and enclosure as the means for managing flood flows. More recently, it has been the MMSD's new found policy to consider removal of these structures whenever the concrete structures deteriorate to the point of needing major repairs or where removal can have a mitigating effect

<sup>1</sup> Honey Creek Stream Classification. 1992. Revision to the Honey Creek Stream Classification, Wisconsin Department of Natural Resources, Southeast District.

<sup>2</sup> Reference United State Geological Survey 7.5 minute Greendale Quadrangle photo revised 1971 and 1976.

<sup>3</sup> Reference United State Geological Survey 7.5 minute Wauwatosa Quadrangle photo revised 1994.



on flooding, safety, recreational and biological uses. Recent projects have been completed by the MMSD that involved the removal of over 4-miles of concrete invert lining in Lincoln Creek and lesser amounts to the bed and banks of the Menomonee River. Feasibility studies are being undertaken for similar projects in the Kinnickinnic River and Menomonee River watersheds. These activities and change in policy allow one to conclude that removal of engineered linings from the bed of these streams or "day lighting" enclosures are technically and financially feasible alternatives to managing flood impacts, and restoring some degree of habitat to urban streams.

### **Recommendations**

It is recommended that the previous reach-by-reach biological use classification for Honey Creek be changed from a *Limited Aquatic Life Community* and *Warmwater Forage Fish Community* to *Warmwater Forage Fish Community* throughout its entire course, regardless of the existing channel condition. Recent local initiatives that reconsider traditional flood control practices in lieu of more comprehensive approaches that include restoring and managing streams in their natural alluvial beds have been shown to be technically and financially feasible. The revised use classification will allow for a comprehensive water resource management strategy that protects the stream for the highest existing downstream uses.

D:/wawrzw/Honey Creek stream classification 20030517\_wgw

**ROW Detailed Information**

WBIC: 16300  
 Waterbody Name: HONEY CREEK  
 Local Name:  
 Waterbody Type: River/Stream  
 Basin: Milwaukee River  
 County: Milwaukee

**Location Data at Mouth**

TOWN	RANGE	SEC	Q SEC	QQ SEC	QQQ SEC	QQQQ SEC
07	21E	27	NW	NW		

**Size For Total Waterbody**

STREAM LENGTH MILES	LAKE ACRES	SHORELINE LENGTH mi
10	0	0

**Other Data**

1st Dwnstrm WBIC	1st Dwnstrm Name	USGS Hydro Code	Landlocked	Status
		4040003		Exist

County info comes from County Surface Water Publications. The following is county characteristic data, it applies to the county segment of the waterbody.

County: Milwaukee

**Location at County Border**

TOWN	RANGE	RANGE DIR	SEC	Q SEC	QQ SEC
07	21	E	27	NW	NW

**Size of Waterbody for County Segment**

MAX DEPTH FT	% BELOW 20 FT	% ABOVE 3 FT	SHORELINE LENGTH mi
2	0	99	16.8

**County Segment Characteristic Data**

WATERSHED AREA mi2	OUTLET FLOW cfs	PUBLIC FRONTAGE mi	DRAINAGE AREA mi2	ADJOINING WETLANDS acres	% GRAVEL	% ROCK	% MUCK	% SAND	% DRAINAGE WILD
13	100	8	13	0	25	20	50	5	0

Milwaukee Grey Iron  
Honey Creek

**Bosch, Theodore J**

**From:** Fratrick, James F  
**Sent:** Tuesday, May 14, 2002 3:54 PM  
**To:** Bosch, Theodore J  
**Subject:** FW: Briggs & Stratton Thermal Limit

TED: FYI, Jim.....

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**From:** Wawrzyn, William G  
**Sent:** Tuesday, May 14, 2002 11:10 AM  
**To:** Fratrick, James F; Krohn, Charles J; Wakeman, Robert S  
**Cc:** Gayan, Sharon L; Helker, Craig D; Galarneau, Stephen G; Masterson, John P; Garbisch, Shelley D; Burzynski, Marsha B  
**Subject:** RE: Briggs & Stratton Thermal Limit

Thanks Bob and Sharon for asking for my input.  
Having read the MJS article last week and having the longest familiarity with this stream and the history surrounding NR 104 I fully expected to hear from our watershed expert sooner.

The MJS author did not capture the fact that on balance, the SER is proposing to greatly reduce the number of variance waterbodies in NR 104. These changes may or may not have been reflected in the information provided to him. For your future reference, the region's biologist recommendations for revisions to NR 104 are attached below. The schedule for implementing these revisions wholesale or in a tiered approach, is not discussed. It is important to recognize that finalization of the region's recommendations are still awaiting clarification of some yet unresolved questions and issues per the attached memo.



NR 104\_to  
searle\_01112001\_draft2.doc



proposed rule - NR 102  
104 106 for strea

With respect to Honey Creek:

The current version of NR 104 has Honey Creek, amongst other waterbodies in the SER, assigned a unique biological use classification. This unique classification and applicable water quality standards are promulgated in NR 104.06(2)(a) and are summarized below. Briefly, the applicable water quality standards afforded this unique classification are somewhere between Limited Forage Fish (LFF) and Limited Aquatic Life (LAL) uses.

from NR 104.06(2)(a) "The following surface waters in the southeast district shall meet the standards for fish and aquatic life except that the dissolved oxygen shall not be lowered to less than 2 mg/L at any time, nor shall the membrane filter fecal coliform count exceed 1,000 per 100 ml as a monthly geometric mean based on not less than 5 samples per month nor exceed 2,000 per 100 ml in more than 10% of all samples during any month:  
NR 104.06(2)(a)1.

1. Underwood creek in Milwaukee and Waukesha counties below Juneau boulevard.  
NR 104.06(2)(a)2.
2. Barnes creek in Kenosha county.  
NR 104.06(2)(a)3.
3. Pike creek, a tributary of Pike river, in Kenosha county.  
NR 104.06(2)(a)4.

4. Pike river in Racine county.  
NR 104.06(2)(a)5.
5. Indian creek in Milwaukee county.  
**NR 104.06(2)(a)6.**
- 6. Honey creek in Milwaukee county.**  
NR 104.06(2)(a)7.
7. Menomonee river in Milwaukee county below the confluence with Honey creek.  
NR 104.06(2)(a)8.
8. Kinnickinnic river in Milwaukee county.  
NR 104.06(2)(a)9.
9. Lincoln creek in Milwaukee county."

I do not have a sense of history as to why these waterbodies were subjected to this unique classification scheme as it pre-dates my tenure with the Department. I suspect they are a result of this agency's reluctance to compete with SEWRPCs original water quality objective standards promoted in earlier watershed plans, and like many of SEWRPC's "planning standards", did not always carry the weight of scientific evidence. Having said that, it was our recommendation that NR 104.06(2)(a) and NR 104.06(2)(b) be deleted from the code and all revised variance waterbodies be assigned the appropriate variance classification consistent with other waterbodies throughout the state.

Honey Creek was re-classified in 1984 and reviewed again in 1992 as part of the Milwaukee River Basin Appraisal and Water Quality Standards Review. The re-classification recommended that "All existing concrete lined or enclosed reaches extending from Honey Creek Parkway bridge in the SW SE T7N R21E S28 to the NW SW T6N R21E S23" be classified as a Limited Aquatic Life (LAL) community, and that all reaches still contained in a natural earthen channel be classified as a Warmwater Forage Fish (WWFF) community. It should be pointed out that the WWFF classification exists in the upper-most and lower-most reaches of Honey Creek. This is very important since it would be the recommendations of the biologist reviewing WPDES effluent limits or other surface water resource management recommendations, that the effluent limits and supporting water quality standards be established to protect for the streams **HIGHEST** biological use, in this case WWFF.

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**From:** Wakeman, Robert S  
**Sent:** Monday, May 13, 2002 1:16 PM  
**To:** Fratrick, James F; Krohn, Charles J  
**Cc:** Gayan, Sharon L; Wawrzyn, William G  
**Subject:** RE: Briggs & Stratton Thermal Limit

Chip,

I don't have stream classification books to look at but I believe if memory serves me correctly that Honey Creek is Limited Fish and Aquatic Life. Willie Wawrzyn would have the information to verify the classification.

*Bob Wakeman*

Aquatic Habitat Coordinator  
(262) 574 - 2149  
(262) 574 - 2117 Fax  
407 Pilot Crt., Suite 100  
Waukesha, WI 53188

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**From:** Krohn, Charles J  
**Sent:** Tuesday, May 07, 2002 4:07 PM  
**To:** Fratrick, James F; Wakeman, Robert S

**Subject:** FW: Briggs & Stratton Thermal Limit

Is Honey Creek classified correctly?

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**From:** Schmidt, James W  
**Sent:** Tuesday, May 07, 2002 8:47 AM  
**To:** Masnado, Robert G; Hantz, Dave J; Bosch, Theodore J  
**Cc:** Fratrack, James F; Gayan, Sharon L; Krohn, Charles J  
**Subject:** RE: Briggs & Stratton Thermal Limit

The problem (???, is it a problem, after reading the NR 104 story in the Journal-Sentinel?) is that Honey Creek is not classified for fish and aquatic life, so I don't use the thermal spreadsheet. It's limited aquatic life, therefore I gave them 120.

James W. Schmidt - WT/2  
Water Quality Standards Section  
DNR Bureau of Watershed Management  
phone # (608) 267-7658

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**From:** Bosch, Theodore J  
**Sent:** Tuesday, May 07, 2002 8:26 AM  
**To:** Masnado, Robert G; Hantz, Dave J; Schmidt, James W  
**Cc:** Fratrack, James F; Gayan, Sharon L; Krohn, Charles J  
**Subject:** Briggs & Stratton Thermal Limit

Milwaukee Grey Iron was permitted as Briggs & Stratton. It was sold in 1997.

I checked the limits on the proposed permit for Milwaukee Grey Iron it has 120F. I ran the spreadsheet for thermal limits and found we should have winter and spring limits of 60, Summer 85 and fall 65. I assumed the flow reported on the application 0.276 MGD and a Q7,10 of 0cfs for Honey Creek at the discharge point.

They do not consistently meet these limits. I have enclosed the SWAMP data for temperature for the last year.

<<File: Milw Grey Thermal Limit.xls>><<File: Milw Grey Data.xls>>

Date 12/13/2001

Facility Name WEST Allis Memorial Hospital and Grey Iron

Receiving Water HONEY CREEK, MILWAUKEE Co. (WIBC = 16300)

Evaluated by WARRZYK, WILL (1992, 1994)

This stream classification is not included in the revised code because (select one):

The discharger is no longer at this location.

A new classification has resulted in a full fish and aquatic life designation.  
New survey date \_\_\_\_\_ Please provide copy of new classification report.

This receiving water should be added to the database and to the code. Specify information, as it should be included in code.

REVISE "ALL EXISTING CONCRETE LINED  
OR ENCLOSED REACHES EXTENDING FROM THE  
HONEY CREEK PARKWAY BRIDGE IN THE  
SW SE T 7N R 21E S 28 TO THE NWSW  
T 6N R 21E S 23"

Other (please explain)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# WATER RESOURCE APPRAISAL FOR HONEY CREEK MENOMONEE RIVER WATERSHED

## I. Description of the Subwatershed

Honey Creek is a continuously flowing tributary of the Menomonee River in Milwaukee County (T7N-R21E-NWNW7).

The Honey Creek subwatershed is heavily urbanized (>90%) and drains 10.3 square miles of five civil divisions including; Milwaukee, Wauwatosa, West Allis, Greenfield and Greendale. Honey Creek flows north for approximately 7.5 stream miles before its confluence with the Menomonee River. The entire length of the creek has been modified to accomodate the large volume of runoff from the existing urban and developing portions of the subwatershed.

Honey Creek flows are very extreme and have been measured between 0.02 and 1,240 ft<sup>3</sup>/sec (USGS, 1981). Although Honey Creek has been used primarily as a storm water conveyance system, the lower portions of this fast-flowing and cascading stream provides a rare natural setting in an otherwise densely populated urban area.

Urban nonpoint source runoff from residential and commercial land uses as well as 36 known sanitary sewer relief devices contribute the majority of pollutant loads to Honey Creek. Based on a very limited data base, SEWRPC (1976) estimated that 15-16% of the CBOD and 4-5% of the phosphorus load to Honey Creek during two rainfall events were contributed by sanitary sewer relief devices. Spills of unknown materials were, until recently, frequent occurences. It is not known if this is a result of an actual decrease in the number of spills or a lack of reporting of incidents. Two permitted industries discharge non-contact cooling water to Honey Creek. They include Chris Hansen Labs and Motor Casting, Inc. Their impact on surface water quality is insignificant (Table 1).

## II. Water Resource Conditions

Honey Creek is currently classified as a non-continuous, urban stream. Subject to the provisions of NR 104.04, Honey Creek is required to meet the criteria for fish and aquatic life standards with variances for dissolved oxygen and bacteria. As stated under NR 102.04 (2)(a): Dissolved oxygen not to be less than 2 mg/l at any time, nor shall the membrane filter fecal coliform count exceed 1000 per 100 ml as a monthly geometric mean based on not less than 5 samples per month nor exceed 2,000 per 100 ml in more than 10% of all samples during any month.

Extensive physical and chemical water quality data have been collected from Honey Creek (WDNR, 1984; SEWRPC, 1976 and Zanoni, 1970) (Table 2). Seasonal and annual chemical loadings and concentrations were calculated for Honey Creek to characterize

residential and commercial nonpoint source and sanitary sewer pollutant loadings to Honey Creek and the Menomonee River. Results from these studies indicate that, like flows, chemical and physical water quality conditions are very extreme in Honey Creek during wet weather events. Despite these extreme conditions, dissolved oxygen, temperature, pH and un-ionized ammonia concentrations and levels have not been shown to violate Wisconsin State full fish and aquatic life water quality standards.

The cumulative impacts of trace elements associated with urban runoff on water quality and aquatic life have not been quantified. Fecal coliform bacteria levels frequently exceeded Wisconsin State recreational use standards, especially during wet weather, high flow events. Recently promulgated NR 105 and NR 106 provide target levels for most of urban NPS-related pollutants. These are listed as acute and chronic toxicity criteria and can be used by applying those criteria in the above-referenced Administrative Codes.

These studies did not determine the existing or predicted frequency of water quality standard violations or pollutant loads contributed by nonpoint sources versus point sources under all management alternatives. Such an analysis should presume that many of these pollutant contributions are from sources which are partially or entirely controllable.

Honey Creek can be divided into two distinct segments based on the degree of channel modifications and resulting instream aquatic habitat.

The entire headwaters region has a channel bottom lined or enclosed in concrete. In open channel areas, side channels are lined with sod and/or concrete. Habitat is sufficient only for the most tolerant benthic organisms. Fish habitat is limited to the lower reaches where eroded concrete bends provide limited cover in small, shallow pools. During low flow periods, depth in this segment severely limits habitat for fish and other aquatic life.

The remaining 0.9 miles of stream, upstream of its confluence with the Menomonee River provides the only suitable habitat capable of providing for a balanced fish and aquatic life community in Honey Creek.

Substrate in this more natural segment consists primarily of rubble and gravel. Pools are scoured of fine sediment particles due to high velocities during runoff events and, during low flow periods due to the steep gradient throughout this portion of the creek (60 ft./mile). During base flow, pool depths provide sufficient habitat for forage and small sized gamefish species. This segment has an excellent riffle/pool ratio with riffle depths sufficient for passage of forage and small sized gamefish species during low flow periods. Runs are the dominant feature

of this stream reach.

Although stream bank erosion can be significant during high flow periods, important bank erosion control devices have recently been constructed in portions of this segment. Placement of rubble-filled gabions and boulder-size rip rap along the banks has significantly reduced bank erosion in these areas, at the same time providing important habitat for forage and game fish.

Rip rap and gabion placement has had as good or better effects on minimizing bank erosion and providing fish and aquatic life habitat than a diverse growth of vegetative bank cover would. Overall, habitat was judged to be fair and capable of sustaining a forage fish and a small sized gamefish population (eg. sunfish).

Historically, fish collected from Honey Creek in the early 1900's included only redbside dace, pallid shiner and the golden shiner (Fago, 1973)(Table 3). The first two species are currently listed on the Wisconsin watch and threatened fish species list, respectively. Collections made from Honey Creek in 1973 included only goldfish and green sunfish. The absence of the three original pollution intolerant forage species from recent collections is indicative of the degraded water quality and loss of habitat throughout the Honey Creek subwatershed.

Qualitative fish samples collected in 1984 showed low species diversity. The fish community is dominated by large numbers of intolerant blacknose dace. Blacknose dace were collected in large numbers during two surveys and populations sampled in late May contained large numbers of adult dace in spawning condition. The improved state of the intolerant forage fishery in Honey Creek may be due to a the improved habitat and water quality in Honey Creek and Menomonee River and implementation of stream bank erosion control practices in the lower reaches.

Recent benthic macroinvertebrate collections and Hilsenhoff Biotic Index indicate fair to very poor water quality. This range of HBI values may indicate water quality problems related to controllable, catastrophic events such as spills and sanitary sewer discharges. In addition, high concentrations of pollutants associated with first flush, spring runoff may also be limiting to stream biota.

Growths of attached filamentous algae are common throughout this stream, however, they are not present in nuisance amounts.

### III. Water Resource Management Objectives

After evaluating the use class criteria, it is recommended that the segment of Honey Creek from its headwaters to the present end of the concrete channel in the Honey Creek Parkway be classified as use class E, a marginal fish and aquatic life stream (MAR-E).

*Classified Aquatic Life (Marginal) per NR 102*

The remaining portion of Honey Creek within the non-concrete lined channel, shall be classified as use class C, a full fish and aquatic life stream (FAL-C). Water quality standards should be applied which will protect these use classifications and the use classifications of downstream segments including the final receiving stream the Menomonee River.

The recommended water resource management objectives for Honey Creek are provided below. They include objectives to be addressed by both NPS and IRM planning processes.

- A. Provide information and education activities aimed at sensitizing the public to the resource values, environmental damage caused by wetland alterations and channelization as well as providing alternatives (IRM, UW, WM).
- B. Control streambank erosion loadings of sediment and nutrients throughout the parkway. Wherever practical, selection of best management practices should consider activities which enhance fish, aquatic life and wildlife habitats. (NPS, COUNTY, LANDOWNERS, WM, FM, PARKS).
- C. Reduce existing and future urban land use loadings of sediment, bacteria, nutrients, heavy metals and other toxic material to levels defined in the Nonpoint Source Pollution Abatement Plan. (NPS, MUNICIPAL, PRIVATE).
- D. Provide information and education activities aimed at educating the public to alternative lawn and garden maintenance practices, recycling and pet waste management (IRM, UW, WM).
- E. Develop and enforce an erosion control ordinance for the cities of Elm Grove, Brookfield (NPS, MUNICIPALITY).
- F. Implement a stormwater management plan (MUNICIPALITY, WRM, NPS).
- G. The prevention and immediate clean-up of spills to Honey Creek.
- I. Removal of sanitary sewer discharges.
- J. Enact stringent industrial and materials storage inspection codes to prevent "accidental" discharge or materials washoff of lots due to precipitation
- K. Continued placement of streambank erosion control devices and, to some degree, the implementation of cost effective urban nonpoint source control practices.

## References

- Ball, Joseph. 1982. Stream Classification Guidelines for Wisconsin. Technical Bulletin.
- Bannerman, R., M.F. Bohn, J.G. Konrad, G.V. Simsiman. 1984. The IJC Menomonee River Watershed Study: Surface Water Quality from 1975-1979. Volume 12, EPA-905/4-79-209L.
- Fago, Donald M. 1973. Distribution and Relative Abundance of Fishes in Wisconsin IV: Milwaukee River Basin. Technical Report  
(Rough draft).
- Hilsenhoff, W.L. 1982. Using a Biotic Index to Evaluate Water Quality in Streams. Wisconsin Department of Natural Resources Technical Bulletin 132.
- Southeastern Regional Wisconsin Regional Planning Commission. 1976. A Comprehensive Plan for the Menomonee River Watershed: Inventory Findings and Forecasts. Planning Report No. 26, Vol.1, October.
- United States Geological Service. 1981. Water Resources Data for Wisconsin. Water Year 1981. U.S.G.S. Report No. WI-81-1.
- Wisconsin Department of Natural Resources. 1979. Hilsenhoff Biotic Index Values for Honey Creek. Southeast District Water Resource Management Files.
- Wisconsin Department of Natural Resources. 1984. Section 24 Water Quality Standards Review for the Milwaukee Metropolitan Area. Bureau of Water Resource Management, Madison. May 16 correspondence to USEPA.
- Zanoni, A. 1970. A Eutrophic Evaluation of a Small Multi-Land Use Watershed. University of Wisconsin Water Resource Center Technical Report

Table . Streams of the Honey Creek (HC) Subwatershed - 10.8 Square Miles. Milwaukee County

Name of Stream	Length (Miles)	Use Classification		Miles Supporting Potential Use	Use Problems Source/Factor	Assessed/ Monit'd	Miles Degraded	Miles Improved	Miles <sup>a</sup> Riparian Wildlife Habitat	References
		Current Use	Potential Use	Fully/Part/Not						
<b>Perennial</b>										
<b>Honey Creek</b>										
T7N R21E, Sec. 27 NWNW										
<b>Stream Segment 1</b> HC001-4 (From headwaters to present end of concrete channel in Honey Creek Parkway)	8.0	MAR-E	MAR-E <sup>c</sup>	8.0/	PSM-SSO/BAC HM/CHA, FLOW, LOSS	8.0/8.0	0.0	0.0	0.7	12, 21, 2
<b>Stream Segment 2</b> HC005 (From present end of concrete channel in Honey Creek Parkway to confluence with Menomonee River)	0.9	FAL-C	FAL-C	/0.9/	NPS-URB/SED, NUT, TOX, MET -SB/SED PSM-SSO/BAC	0.9/0.9	0.9	0.0		
<b>TOTAL STREAM MILES</b>	<b>8.9</b>									

a. Total of all streams, 100% forested cover types.

b. Page 11.

c. Should concrete removal occur, this use classification will be reviewed and upgraded if appropriate.

Stream Classification for Honey Creek  
Menomonee River Watershed  
Milwaukee River Basin  
Milwaukee County, Wisconsin  
September, 1984  
By Will Wawrzyn

## INTRODUCTION

### Objective

The objective of this stream classification is to determine the appropriate use designation for Honey Creek based on the Stream Classification Guidelines for Wisconsin (Ball, 1982). The final designation is determined by evaluating the physical, chemical and biological factors which influence the potential resource value of this water body.

### DESCRIPTION OF THE WATER RESOURCE

Honey Creek is a continuously flowing tributary of the Menomonee River in Milwaukee County (Q<sub>7,10</sub> of 0.02 ft<sup>3</sup>/sec (USGS, 1981). The creek discharges to the Menomonee River in T7N, R21E, Sec. 27, NW 1/4, NW 1/16.

The watershed is heavily urbanized (>90%) and drains 10.3 square miles of five civil divisions including Milwaukee, Wauwatosa, West Allis, Greenfield and Greendale. Honey Creek flows north for approximately 7.5 stream miles before its confluence with the Menomonee River (Map). The entire length of the creek has been modified to accommodate the large volume of runoff from the urbanized or developing watershed.

Urban nonpoint source runoff from residential and commercial land uses and 36 known sanitary sewer relief devices contribute the majority of pollutant loads to Honey Creek. Based on a very limited data base, SEWRPC (1976) estimated that 15-16% of the CBOD and 4-5% of the phosphorus load to Honey Creek during two rainfall events, were contributed by sanitary sewer relief devices. Spills of unknown materials were, until recently, frequent occurrences. It is not known if this is a result of an actual decrease in the number of spills or a lack of reporting of incidents. Two permitted industries discharge noncontact cooling water to Honey Creek. They include Chris Hansen Labs and Motor Casting, Inc. Their impact on surface water quality is insignificant (Table 1).

Honey Creek is currently classified as a noncontinuous, urban stream. Subject to the provisions of NR 104.04, Honey Creek shall meet the criteria for fish and aquatic life standards with the exceptions as stated under NR 102.04(2)(a): Dissolved oxygen not to be less than 2 mg/l at any time, nor shall the membrane filter fecal coliform count exceed 1000 per 100 ml as a monthly geometric mean based on not less than 5 samples per month nor exceed 2,000 per 100 ml in more than 10% of all samples during any month.

## Habitat Evaluation

Honey Creek habitat evaluations were conducted on three separate summer dates during three different flow regimes (0.5-25 ft<sup>3</sup>/sec). Based on these evaluations, the water course can be divided into two distinct segments based on the degree of channel modifications.

### Segment 1

Segment one starts at the upper end of the headwaters region and flows <sup>NORTH</sup> ~~south~~ for approximately 7 miles. The entire segment has a bottom channel lined or enclosed in concrete. In open channel areas, side channels are lined with sod and/or concrete. Habitat is sufficient only for the most tolerant benthic organisms. Fish habitat is limited to the lower reaches where concrete has failed, cracked or became pitted. These areas provide limited cover in small, shallow pools (.5-1.0 ft.) and are found along the outside of bends. During low flow periods, depth in this segment ranges from 0.1-0.3 feet (Table 2).

### Segment 2

Segment two includes the remaining 0.5 miles of stream, upstream of its confluence with the Menomonee River. Although limited in length, this segment provides the only suitable habitat capable of providing for a balanced fish and aquatic life community in Honey Creek.

Substrate in this segment consists of rubble, gravel and lesser amounts of sand and scoured clay. Pools are scoured of fine sediment particles due to high velocities during runoff events and, during low flow periods, because of the steep gradient throughout this segment (60 ft./mile). During base flow, pool depths range from 2-3 feet and provide sufficient habitat for forage and small sized game fish species. This segment has an excellent riffle/pool ratio. Riffle depths range from 0.1-0.3 feet and are sufficient for the passage of forage and small sized game fish species during low flow periods. Runs are the dominant feature of this stream segment and depths range from 0.5-1.0 feet. Average stream width is approximately 25 feet, stream bank heights range from 5-10 feet and are very steep, almost perpendicular.

Although stream bank erosion can be significant during high flow periods, important bank erosion control devices have recently been constructed in portions of this segment. Placement of rubble and gravel filled gabions and boulder-size rip rap along the banks has significantly reduced bank erosion in these areas, at the same time providing important habitat for forage and small sized game fish species.

Honey Creek flows are very extreme and have been measured between 0.02 and 1,240 ft<sup>3</sup>/sec (USGS, 1981).

Not all of the habitat rating items were applicable for the channelized portion of Honey Creek. For example, rip rap and gabion placement has reduced bank erosion and provided fish and aquatic life habitat equivalent to or better than the diverse growth of vegetative bank cover would. Overall, habitat was judged to be fair and capable of sustaining a forage fish and a small sized game fish population (e.g. sunfish) (Table 2.)

Although Honey Creek has been used primarily as a storm water conveyance system, the lower portions of this fast-flowing and cascading stream provides a rare natural setting in an otherwise densely populated urban area.

### Water Quality

Extensive physical and chemical water quality data have been collected from Honey Creek (WDNR, 1984; SEWRPC, 1976 and Zanoni, 1970) (Table 3). Seasonal and annual chemical loadings and concentrations were calculated for Honey Creek to characterize residential and commercial nonpoint source and sanitary sewer pollutant loadings to Honey Creek and the Menomonee River. Results from these studies indicate that, like flows, chemical and physical water quality conditions are very extreme in Honey Creek during wet weather events. Despite these extreme conditions, dissolved oxygen, temperature, pH and unionized ammonia concentrations and levels have not been shown to violate Wisconsin State full fish and aquatic life water quality standards. The cumulative impacts of trace elements associated with urban runoff on water quality and aquatic life have not been qualified. Fecal coliform bacteria levels frequently exceeded Wisconsin State recreational use standards, especially during wet weather, high flow events.

These studies did not determine the existing or predicted frequency of water quality standard violations or pollutant loads contributed by nonpoint sources versus point sources under all management alternatives. Such an analysis should presume that many of these pollutant contributions are from sources which are partially or entirely controllable.

### Biological

#### Fish

Historically, fish collected from Honey Creek in the early 1900's included only reddsides, pallid shiner and the golden shiner (Fago, 1973) (Table 4). The two forementioned species are currently listed on the Wisconsin watch and threatened fish species list, respectively. Collections made from Honey Creek in 1973 included only goldfish and green sunfish. The absence of these pollution intolerant forage species from recent collections is indicative of the degraded water quality and loss of habitat throughout the Honey Creek watershed.

In May and July of 1984, qualitative fish samples were collected from Honey Creek using a DC pulse fish shocker. Based on these results, Honey Creek is represented by fish species of four fish classifications: sport species, intolerant, tolerant and very tolerant forage species (Table 4). Although diversity is low, (5 species), the fishery is dominated by large numbers of intolerant blacknose dace. Blacknose dace were collected in large numbers during both surveys. Populations sampled in late May contained large numbers of adult dace in spawning condition. The improved state of the intolerant forage fishery in Honey Creek may be due to the improved water quality in Honey Creek and Menomonee River and implementation of stream bank erosion control practices in the lower reaches.

## Benthos

Benthic macroinvertebrate samples were collected from Honey Creek using the standard Hilsenhoff Biotic Index (HBI) technique in the spring and fall of 1979 and spring of 1984 (Hilsenhoff, 1982) (Table 5). HBI values for 1979 indicated fair water quality, while HBI results from the 1984 spring samples indicated very poor water quality. Low diversity and numbers of macroinvertebrates collected in conjunction with both spring samples may indicate more limiting water quality during the previous winter and spring seasons. This range of HBI values may indicate water quality problems related to controllable, catastrophic events such as spills and sanitary sewer discharges. In addition, high concentrations of pollutants associated with first flush, spring runoff may also be limiting to stream biota.

Epilithic growths of filamentous algae are common throughout this stream segment, however they are not present in nuisance amounts.

## Recreational Use

The recreational use potential of Honey Creek is limited by its size, extreme flow conditions, concrete channel modifications and controllable and partially controllable sources of bacterial contamination. During frequent reoccurring periods of high-flow, Honey Creek is considered navigable. Drop structures and enclosed channel reaches restrict navigability to natural open channel reaches only.

Honey Creek's sport fishery is not of high enough caliber to support fishing. The potential exists to extend the current range of anadromous Lake Michigan fish populations to include Honey Creek by removing or altering the Menomonee River drop structure at 45th Street. Even with the removal of this structure, it is doubtful that Honey Creek would support a continuous and fishable population of sport fish. Forage fish, such as white sucker, would likely provide most of the recreational fishery.

Besides fishing, wading during low-flow periods would provide most of the water borne recreational use activities along the creek. The water quality data indicate that during periods of high-flow the Wisconsin State Recreational Use Standard for fecal coliform bacteria is exceeded. This imposes limitations on what recreational activities the creek can safely be used for. Elimination of the sanitary sewer overflows would reduce the bacterial contamination and would result in improved overall water quality. Bacterial contributions from urban sources would be more difficult to control.

The lower portion of Honey Creek contributes significantly to the aesthetic quality of the adjacent parkway system. Waterfowl have been observed in this section of the creek in addition to owls, song birds and a variety of other wildlife.

Based on the available information, it is recommended that Honey Creek's recreational activity be classified as partial body contact.

## SUMMARY and RECOMMENDATIONS

A stream classification was completed for Honey Creek to determine an appropriate use designation based on physical, chemical and biological factors which effect the potential use of this resource.

The entire channel of Honey Creek has been altered to accommodate large volumes of runoff associated with urban areas. Approximately 7 miles of Honey Creek channel bottom and sides, from its headwaters to the Honey Creek Parkway, have been lined or completely enclosed in concrete. This type of habitat is capable of supporting only the most tolerant of benthic organisms and is incapable of sustaining any significant fish population.

Fish and aquatic life habitat was also evaluated for the remaining 0.5 miles of Honey Creek. Instream habitat was judged to be fair and capable of supporting a forage and a small sized sport fish population such as sunfish.

Physical and chemical extremes in water quality have been observed in Honey Creek especially during wet weather nonpoint source events. Despite these wide fluctuations, dissolved oxygen, pH, temperature and unionized ammonia concentrations and levels did not exceed Wisconsin state full fish and aquatic life standards. Fecal coliform bacteria levels frequently exceed Wisconsin State recreational use standards, especially during wet weather events. At present, urban nonpoint source runoff, sanitary sewer discharges and bank erosion are limiting water quality. These pollutant sources are partially or completely controllable.

In recent years, benthic macroinvertebrate populations were indicative of fair to very poor water quality. This variability among the tolerance of organisms collected may be a result of catastrophic events and not related to habitat limitations. The presence of a large, self-sustaining blacknose dace population indicates that Honey Creek habitat is already capable of supporting an intolerant forage fish population.

The prevention of spills, removal of sanitary sewer discharges, continued placement of stream bank erosion control devices and, to some degree, the implementation of cost effective urban nonpoint source control practices, should improve existing water quality and maintain the recommended biological and recreational use of Honey Creek.

The current use classification of Honey Creek is a noncontinuous urban stream. After evaluating the use class criteria, it is recommended that the segment of Honey Creek from its headwaters to the present end of the concrete channel in the Honey Creek Parkway be classified as use class E, a marginal fish and aquatic life stream (MAR-E). The remaining portion of Honey Creek within the nonconcrete lined channel, shall be classified as use class C, a full fish and aquatic life stream (FAL-C). Water quality standards should be applied which will protect these use classifications and the use classifications of downstream segments including the final receiving stream the Menomonee River. (See Appendix 1 for potential presentation)..

*potential*

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## References

- Ball, Joseph. 1982. Stream Classification Guidelines for Wisconsin. Technical Bulletin.
- Bannerman, R., M. F. Bohn, J. G. Konrad, G. V. Simsiman. 1984. The IJC Menomonee River Watershed Study: Surface Water Quality from 1975-1979. Volume 12, EPA-905/4-79-209L.
- Fago, Donald M. 1973. Distribution and Relative Abundance of Fishes in Wisconsin IV: Milwaukee River Basin. Technical Report (Rough draft).
- Hilsenhoff, W. L. 1982. Using a Biotic Index to Evaluate Water Quality in Streams. Wisconsin Department of Natural Resources Technical Bulletin 132.
- Southeastern Regional Wisconsin Regional Planning Commission. 1976. A Comprehensive Plan for the Menomonee River Watershed: Inventory Findings and Forecasts. Planning Report No. 26, Vol. 1, October.
- United States Geological Service. 1981. Water Resources Data for Wisconsin. Water Year 1981. U.S.G.S. Report No. WI-81-1.
- Wisconsin Department of Natural Resources. 1979. Hilsenhoff Biotic Index Values for Honey Creek. Southeast District Water Resource Management Files.
- Wisconsin Department of Natural Resources. 1984. Section 24 Water Quality Standards Review for the Milwaukee Metropolitan Area. Bureau of Water Resource Management, Madison. May 16 correspondence to USEPA.
- Zanoni, A. 1970. A Eutrophic Evaluation of a Small Multi-Land Use Watershed. University of Wisconsin Water Resource Center Technical Report

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Table 1

WPDES Permitted Discharges to Honey Creek

Chris Hansen Laboratories, Inc.

Permit # 27341

Limits and Monitoring Requirements: None

Comments: General permit for noncontact cooling water discharge.

Motor Casting, Inc. Plant #2

Permit # 1431

Limits and Monitoring Requirements: 001 Flow est.  
Temp. 115 F  
O&G 10 mg/l

Comments: None

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Table 2

Department of Natural Resources

STREAM SYSTEM HABITAT RATING FORM  
Form 3200-68 1-85

Stream Honey Cr Reach Location Honey Cr. Parkway Reach Score/Rating 166  
 County MIW Date 18 MAY 84 Evaluator W. W. M. R. Zup Classification FAL-C  
24 MAY 84

14  
14  
16  
9 Stable rip rap & boulders extensive  
14  
9  
8  
2  
20  
20  
24  
4  
12

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion	No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. 8	Some erosion evident. No significant "raw" areas. Good land mgmt. practices in area. Low potential for significant erosion. 10	Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. 14	Heavy erosion evident. Probable erosion from any run off. 16
Watershed Nonpoint Source	No evidence of significant source. Little potential for future problem. 8	Some potential sources (roads, urban area, farm fields). 10	Moderate sources (small wetlands, tile fields, urban area, intense agriculture). 14	Obvious sources (major wetland drainage, high use urban or industrial area, feed lots, impoundment). 16
Bank Erosion, Failure	No evidence of significant erosion or bank failure. Little potential for future problem. 4	Infrequent, small areas, mostly healed over. Some potential in extreme floods. 8	Moderate frequency and size. Some "raw" spots. Erosion potential during high flow. 16	Many eroded areas. "Raw" areas frequent along straight sections and bends. 20
Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 6	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 8	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding. 15	<50% density. Many raw areas. Thin grass, few if any trees and shrubs. 18
Lower Bank Channel Capacity	Amply for present peak flow plus some increase. Peak flow contained. W/D ratio < 7. 8	Adequate. Overbank flows rare. W/D ratio 8-15. 10	Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. 15	Inadequate. overbank flow common. W/D ratio > 25. 18
Lower Bank Deposition	Little or no enlargement of channel or point bars. 8	Some new increase in bar formation, mostly from coarse gravel. 9	Moderate deposition of new gravel and coarse sand on old and some new bars. 15	Heavy deposits of fine material, increased bar development. 18
Bottom Scouring and Deposition	Less than 5% of the bottom affected by scouring and deposition. 4	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. 8	30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. 16	More than 50% of the bottom changing nearly year long. Pools almost absent due to deposition. 20
Bottom Substrate/Available Cover	Greater than 50% rubble, gravel or other stable habitat. 2	30-50% rubble, gravel or other stable habitat. Adequate habitat. 7	10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. 17	Less than 10% rubble gravel or other stable habitat. Lack of habitat is obvious. 22
Avg. Depth (Riffles and Runs)	Cold >1' 0 Warm >1.5' 0	6" to 1' 6 10" to 1.5' 6	3" to 6" 18 6" to 10" 18	<3" 24 <6" 24
Avg. Depth of Pools	Cold >4' 0 Warm >5' 0	3' to 4' 6 4' to 5' 6	2' to 3' 18 3' to 4' 18	<2' 24 <3' 24
Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	5-1 cfs 18 1-2 cfs 18	<5 cfs 24 <1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles + stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. 16	>25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 20
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or un-pastured corridor. 8	High natural beauty. Trees, historic site. Some development may be visible. 10	Common setting, not offensive. Developed but uncluttered area. 12	Stream does not enhance aesthetics. Condition of stream is offensive. 16

Column Totals:

Column Scores E \_\_\_ +G \_\_\_ +F \_\_\_ +P \_\_\_ = Score

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

TABLE 2

See reverse side for additional habitat features, water quality impacts and comments.

Stream Honey Cr. Reach Location Concrete segment from Honey Cr. Parkway upstream to headwaters Reach Score/Rating \_\_\_\_\_  
 County Miss Date 24 May 84 Evaluator U. Wawrzyn Classification \_\_\_\_\_

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion	No evidence of significant erosion. Stable forest or grass land. Little potential for future erosion. 8	Some erosion evident. No significant "raw" areas. Good land mgmt. practices in area. Low potential for significant erosion. 10	Moderate erosion evident. Erosion from heavy storm events obvious. Some "raw" areas. Potential for significant erosion. 14	Heavy erosion evident. Probable erosion from any run off. 16
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Bank Vegetative Protection	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 6	70-90% density. Fewer plant species. A few barren or thin areas. Vegetation appears generally healthy. 9	50-70% density. Dominated by grass, sparse trees and shrubs. Plant types and conditions suggest poorer soil binding. 15	<50% density. Many raw areas. Thin grass, few if any trees and shrubs. 18
Lower Bank Channel Capacity	Ample for present peak flow plus some increase. Peak flow contained. W/D ratio <7. 8	Adequate. Overbank flows rare. W/D ratio 8-15. 10	Barely contains present peaks. Occasional overbank flow. W/D ratio 15-25. 14	Inadequate, overbank flow common. W/D ratio >25. 16
Lower Bank Deposition	Little or no enlargement of channel or point bars. 6	Some new increase in bar formation, mostly from coarse gravel. 9	Moderate deposition of new gravel and coarse sand on old and some new bars. 16	Heavy deposits of fine material, increased bar development. 18
Bottom Scouring and Deposition	Less than 5% of the bottom affected by scouring and deposition. 4	5-30% affected. Scour at constrictions and where grades steepen. Some deposition in pools. 8	30-50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools. 16	More than 50% of the bottom changing nearly year long. Pools almost absent due to deposition. 20
Bottom Substrate/Available Cover	Greater than 50% rubble, gravel or other stable habitat. 2	30-50% rubble, gravel or other stable habitat. Adequate habitat. 7	10-30% rubble, gravel or other stable habitat. Habitat availability less than desirable. 17	Less than 10% rubble gravel or other stable habitat. Lack of habitat is obvious. 23
Avg. Depth Riffles and Runs	Cold >1' 0 Warm >1.5' 0	6" to 1' 6 10" to 1.5' 6	3" to 6" 18 6" to 10" 18	<3" 24 <6" 24
Avg. Depth of Pools	Cold >4' 0 Warm >5' 0	3' to 4' 6 4' to 5' 6	2' to 3' 18 3' to 4' 18	<2' 24 <3' 24
Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	.5-1 cfs 18 1-2 cfs 18	<.5 cfs 24 <1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles + stream width)	5-7. Variety of habitat. Deep riffles and pools. 4	7-15. Adequate depth in pools and riffles. Bends provide habitat. 8	15-25. Occasional riffle or bend. Bottom contours provide some habitat. 16	>25. Essentially a straight stream. Generally all flat water or shallow riffle. Poor habitat. 20
Aesthetics	Wilderness characteristics, outstanding natural beauty. Usually wooded or un-pastured corridor. 8	High natural beauty. Trees, historic site. Some development may be visible. 10	Common setting, not offensive. Developed but uncluttered area. 14	Stream does not enhance aesthetics. Condition of stream is offensive. 16

Column Totals: \_\_\_\_\_

Column Scores E \_\_\_\_\_ +G \_\_\_\_\_ +F \_\_\_\_\_ +P \_\_\_\_\_ = \_\_\_\_\_ = Score

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

See reverse side for additional habitat features, water quality impacts and comments.







Table 4  
Fish Distribution Data

Sample Date	Location	Species	Number	Tolerance
3/13/10	Segment 2 ?	Redside Dace	2	IT
		Golden Shiner	20	T
3/20/10	"	Redside Dace	13	IT
		Pallid Shiner	1	-
8/7/73	" (mile 0.1)	Goldfish	3	VT
		Green Sunfish	7	Sport
9/10/73	Segment 1 (mile 4.9)	(No fish collected)		
5/24/84	Segment 2 (mile 0.2)	Blacknose Dace	>100	IT
		White Sucker	11	T
		Fathead Minnow	10	VT
		Creek Chub	1	T
		Green Sunfish	1	Sport
7/27/84	"	Blacknose Dace	50	IT
		White Sucker	2	T
		Green Sunfish	2	Sport

Spring 1979

Species	Number	Tolerance
Cricotopus spp.	2	4
Conchapelopia spp.	2	3

Biotic Index 3.50 (Fair water quality)

Fall 1979

Species	Number	Tolerance
Hydropsyche simulans	1	3
" betteni	21	3
Hyallolela aztec a	1	4
Conchapelopia spp.	12	3
Procladius spp.	1	3
Orthocladius spp.	1	3
Cricotopus spp.	1	4

Biotic Index 3.05 (Fair water quality)  
4703P

BASIN: \_\_\_\_\_

STRE: Honey Creek COUNTY Blaine SAMPLE NO. 01

PRIMARY STATION NO. \_\_\_\_\_

LOCATION: NW 1/4, N W 1/4, S 27, T 07N, R 21E WATERSHED \_\_\_\_\_

DATE: 05/01/84  
mo day yr.  
Chemical Sample? yes (no)

0 Honey Creek Prairie BIOTIC INDEX: 4-53  
2 1000 FT UPSTREAM CONFLUENCE WITH MORGAN R.

14:50 TIME (24 hr)

AT SAMPLE 20.0 AVG. WIDTH (ft)  
SITE:

7 DO (mg/l)

-80 AVG. DEPTH (ft)

12.0 TEMP (°C)

--- AVG. VELOCITY (measured fps)

--- pH (s.u.)

EST. VELOCITY (fps) 1. very slow (.2); 2. slow

--- CONDUCTIVITY (umhos)

(.2-.5); 3. moderate (.5-1.5); 4. fast (1.5)

SAMPLED HABITAT: Riffle 2. Run 3. Pool

SAMPLER: 1. D Frame Net 2. Artificial Substrate 3. Other \_\_\_\_\_

SUBSTRATE AT SITE LOCATION (%):

Bedrock \_\_\_\_\_ Rubble (2 1/2 - 10" dia.) 30 Sand 10 Clay \_\_\_\_\_ Muck \_\_\_\_\_  
Boulders (10" dia.) 60 Gravel (1/10 - 2 1/2" dia.) \_\_\_\_\_ Silt \_\_\_\_\_ Detritus \_\_\_\_\_ Debris & Vegetation \_\_\_\_\_

SUBSTRATE SAMPLED (%): SAME AS ABOVE ORZ

Bedrock \_\_\_\_\_ Rubble (2/12 - 10" dia.) \_\_\_\_\_ Sand \_\_\_\_\_ Clay \_\_\_\_\_ Muck \_\_\_\_\_  
Boulders (10" dia.) \_\_\_\_\_ Gravel (1/10 - 2 1/2" dia.) \_\_\_\_\_ Silt \_\_\_\_\_ Detritus \_\_\_\_\_ Debris & Vegetation \_\_\_\_\_

AQUATIC VEGETATION: \_\_\_\_\_ % of Total Stream Channel at Sample Site

OBSERVED INSTREAM CONDITIONS AT SAMPLING SITE LIMITING W.O.

	not present	slight	moderate	significant	Comments
Sludge Deposits	<u>np</u>	sl	m	s	<u>SCOUR FROM HEAVY RAINS TWO DAYS PREVIOUS</u>
Silt & Sediment Deposits	<u>np</u>	sl	m	s	
Turbidity	<u>np</u>	sl	m	s	
Chlorine or Toxic Scour	<u>np</u>	sl	m	s	
Macrophytes	<u>np</u>	sl	m	s	
Filamentous Algae	<u>np</u>	<u>sl</u>	m	s	
Planktonic Algae	<u>np</u>	sl	m	s	
Slimes	<u>np</u>	sl	m	s	
Iron Bacteria	<u>np</u>	sl	m	s	

FACTORS WHICH MAY BE AFFECTING SAMPLING SITE

degree of influence:	General Watershed			At Site	Comments
	not present	possible	important	direct impact	
Livestock Pasturing	<u>np</u>	pos	imp	di	<u>SSO, STORM SEWERS, SPILLS?</u>
Barnyard Runoff	<u>np</u>	pos	imp	di	
Cropland Runoff	<u>np</u>	pos	imp	di	
Tile Drains	<u>np</u>	pos	imp	di	
Septic Systems	<u>np</u>	pos	imp	di	
Streambank Erosion	np	pos	<u>imp</u>	di	
Channel Ditching & Straightening	np	pos	<u>imp</u>	di	
Downstream Impoundment	<u>np</u>	pos	imp	di	
Upstream Impoundment	<u>np</u>	pos	imp	di	
Low Flow	np	<u>pos</u>	imp	di	
Wetlands	<u>np</u>	pos	imp	di	
Urban Runoff	np	pos	<u>imp</u>	<u>di</u>	
Construction Runoff	np	<u>pos</u>	imp	di	
Point Source (specify type) _____	np	<u>pos</u>	imp	di	
Other (specify) _____	np	pos	<u>imp</u>	<u>di</u>	

PERCEIVED WATER QUALITY: 1. Excellent 2. Good 3. Fair 4. Poor 5. Very Poor HABITATS OBSERVED

PLE TRACKING INFORMATION

Dates Artificial Sampler In \_\_\_\_\_

Time Spent Collecting Sample (minutes) 20 Replicate #'s \_\_\_\_\_

Out \_\_\_\_\_

Sampler Collector R. Randall Sorter B. Wakeman

Identifier B. Wakeman

Date 5-1-84

Date 5-16-84

Date 5-22-84



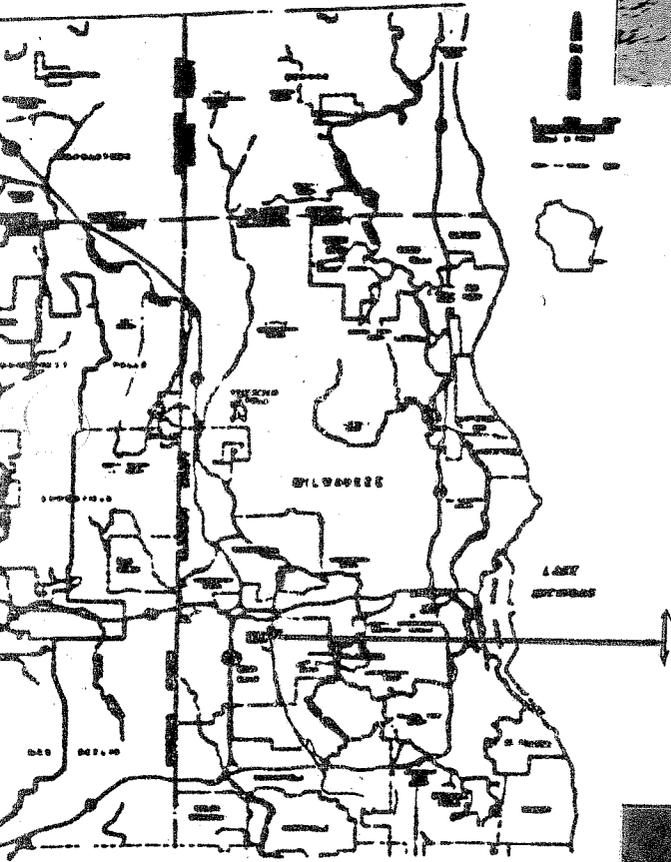
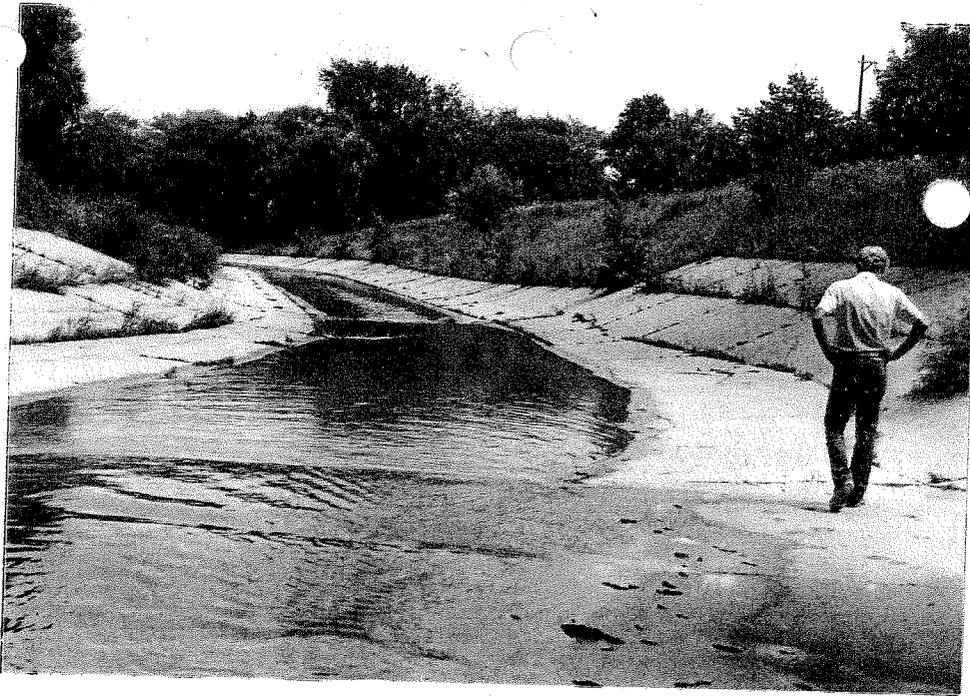
Appendix I

(Pictorial Presentation)

Looking downstream from Blue Mound Road. Location is approximately 1 mile from the confluence with Menomonee River.

Milwaukee Co.

Date: 7/27/84



Honey Creek

Same location looking upstream

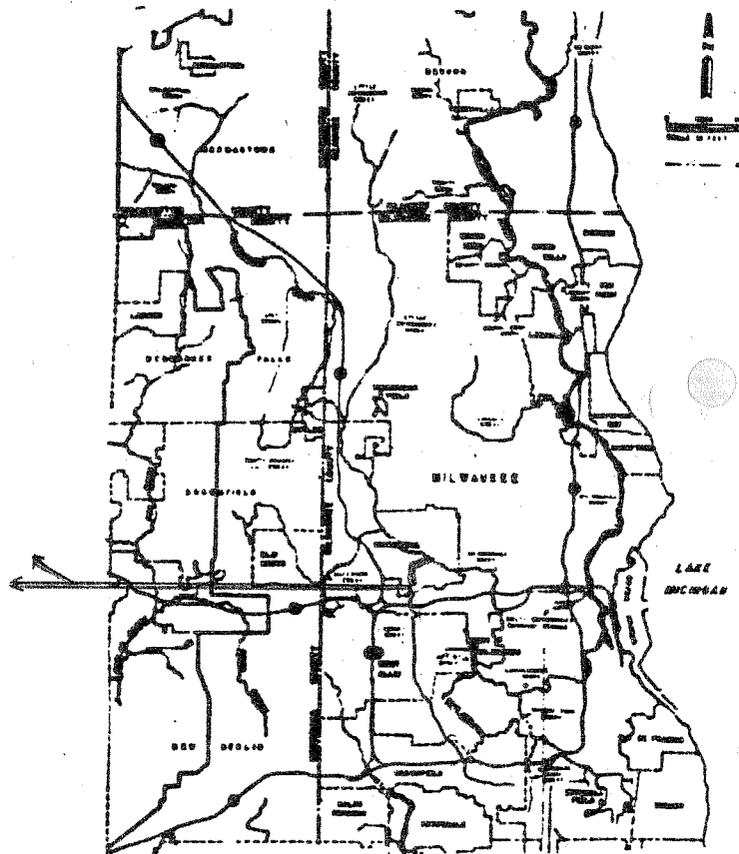




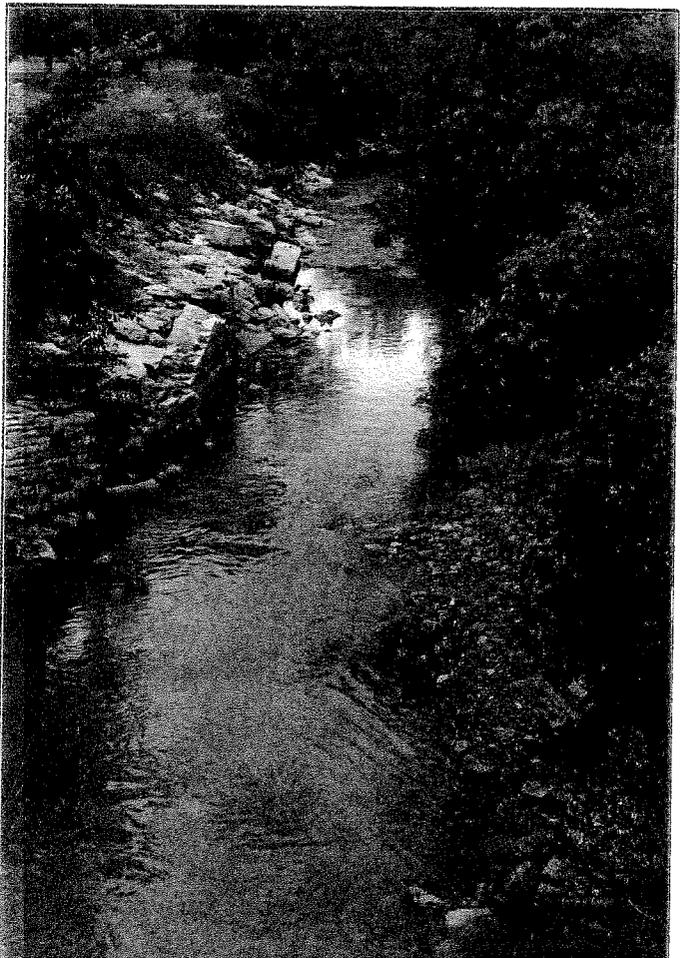
Honey Creek

Looking upstream from Portland Ave. bridge. Location is approximately .3 miles from confluence with Menomonee River.

Milwaukee Co.

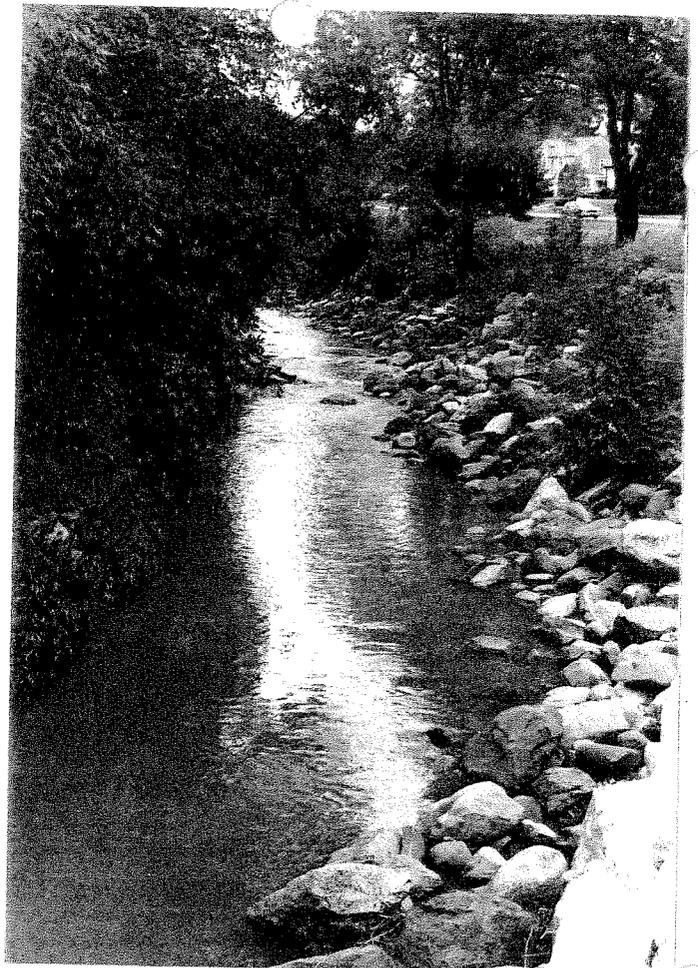


Looking downstream from Portland Ave. bridge.

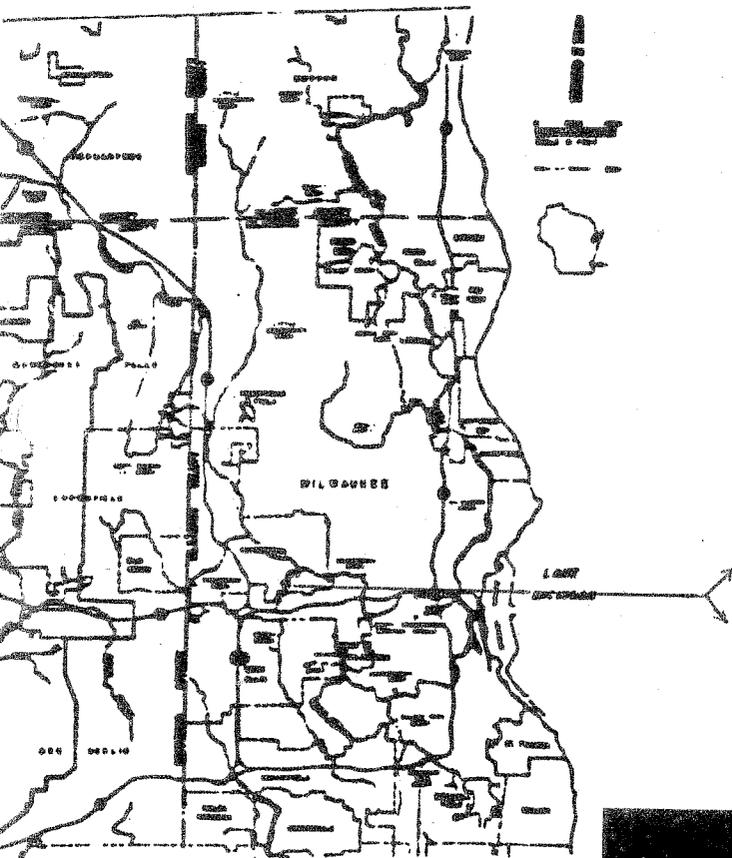


Looking upstream of gabbion adjacent to Honey Creek Parkway. Location is approximately .2 miles from confluence with Menomonee River.

Milwaukee Co.



Honey Creek



Same location at gabbion structure.



*Rick Johnson*

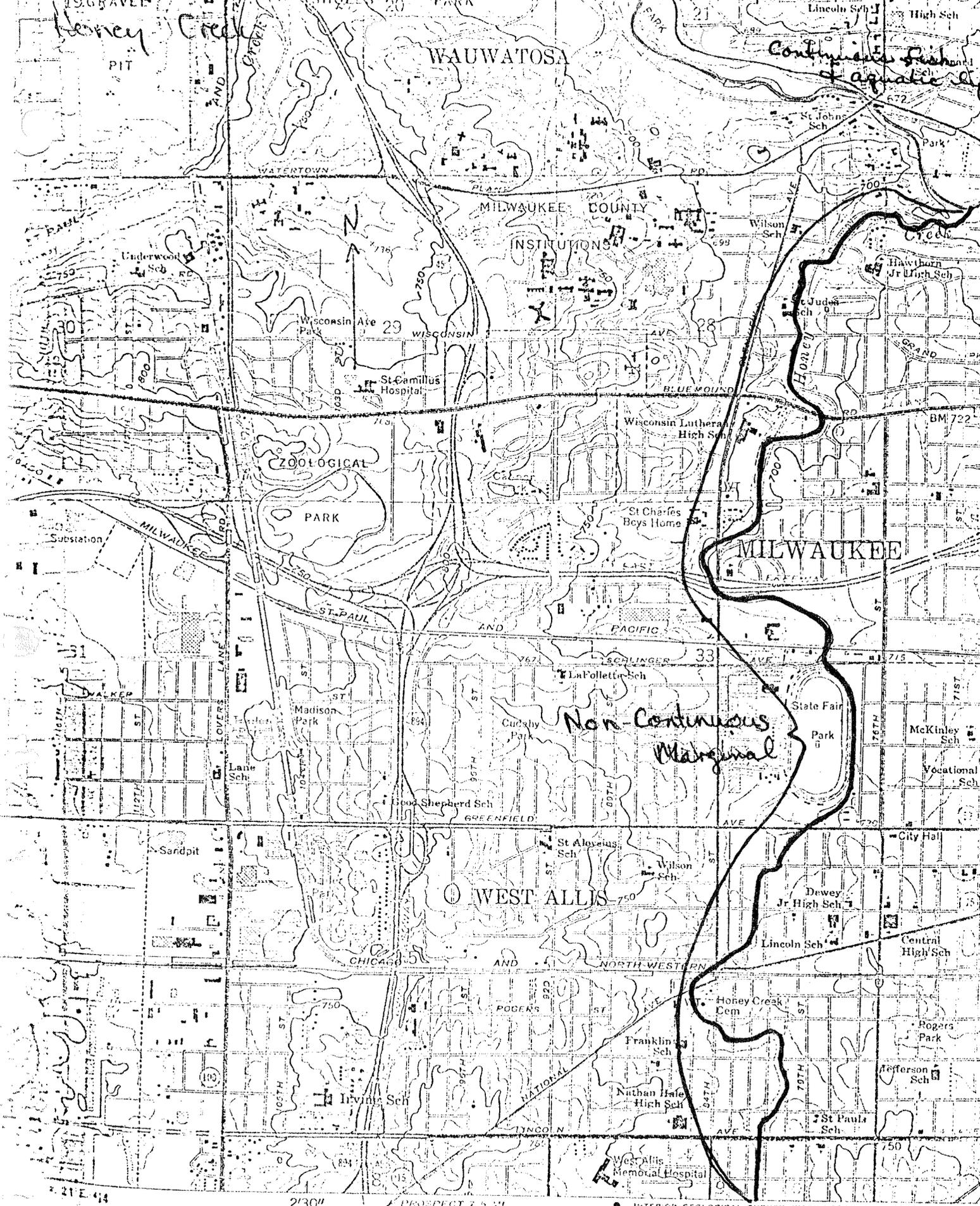
Honey Creek, Milwaukee County  
Milwaukee River Drainage Basin

Honey Creek is a small intermittent tributary of the Menomonee River which provides drainage for portions of the City of Milwaukee and several neighboring municipalities in Milwaukee County. The land use within the drainage area (10.3 square miles) is primarily residential with some light industry. The entire stream has been channelized. The stream flows through an underground conduit from McCarthy Park to Highway 94. Portions of the creek downstream of Highway 94 are concrete lined. The majority of the stream is bordered by park land.

During events the stream is subjected to rapid rises and falls in stage and receives overflow from sanitary surveys.

Recommendations

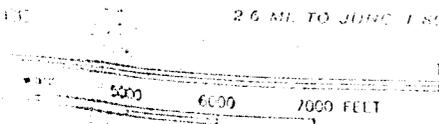
Honey Creek shall be classified as a noncontinuous urban stream. The Menomonee River shall be classified as a continuous fish and aquatic life stream.



GRAVEN  
Honey Creek  
PIT

Continuity of Fish and Aquatic Life

Non-Continuous Marginal



26 MI. TO JUNG L. 80° 5' N. S. 45°  
PROSPECT 7 1/2 MI. MUKWONG 17 MI.

INTERIOR GEOLOGICAL SURVEY, WASHINGTON, D. C. 20515  
413000m E

ROAD CLASSIFICATION

Heavy-duty ——— Light-duty ———