

Region SEK County Sheboygan Report Date 3/87, 12/02 Classification LFF/FAL

Water Body: Barr Creek

Discharger: Cedar Grove, Larson Co.

**If stream is classified as Limited Forage Fish (LFF) or Limited Aquatic Life (LAL), check any of the following Use Attainability Analysis factors that are identified in the classification report:**

- Naturally occurring pollutant concentrations prevent the attainment of use
- Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met
- Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place
- Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or operate such modification in a way that would result in the attainment of the use
- Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses
- Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact

**Supporting Evidence in the report (include comments on how complete/thorough data is)**

- Biological Data (fish/invert)
- Chemical Data (temp, D.O., etc.) avail, not included
- Physical Data (flow, depth, etc.)
- Habitat Description
- Site Description/Map
- Other:

**Historical Reports in file:**

12/9/2002 - Steve Galameau

3/1/1987 - Will Wawrzyn

**Additional Comments/How to improve report:**

- LFF b/c of naturally low flow & water depths - lack of water

- class justified



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor  
Scott Hassett, Secretary

101 S. Webster St.  
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November 10, 2003

Mr. Gene Jentink, President  
Village of Cedar Grove  
P.O. Box 426  
Cedar Grove, WI 53013

Subject: Classification of Barr Creek

Dear Mr. Jentink:

This letter is in response to your inquiries about the classification of Barr Creek and attempts by the Department of Natural Resources to modify that classification through proposed revisions to Ch. NR 104 (Wis. Adm. Code). I have attached for your review all correspondence that applies to this surface water, including the most recent files generated by Regional field biologists that documents their findings of the biota and habitat associated with the stream.

As required by federal law, the Department is to periodically review information related to any waters that do not meet the "full fish & aquatic life" use goal established in the Clean Water Act. Based on historical field assessments, the classification of Barr Creek was promulgated in Ch. NR 104 in 1981 as *Limited Aquatic Life* – a classification that does not meet the Clean Water Act goal. As part of our ongoing efforts to review such classifications, additional data have been collected in recent years and they support a revision to the use designation for Barr Creek. Review of these data has resulted in the proposed classifications of *Limited Forage Fish* (Headwaters to River Mile 2.1) and *Warmwater Forage Fish* (River Mile 2.1 – Lake Michigan). These recommendations have been noted in the Green Sheet packages prepared for the proposed revisions to Ch. NR 104 and are based primarily on the biological data in hand along with a more thorough understanding of stream ecology and the relationships between field data and the potential for a surface water to support a particular type of fish and aquatic life community.

During the last round of public hearings on the proposed revisions to Ch. NR 104, a number of comments were received regarding the classification changes. In May 2002, a formal objection to the proposal for Barr Creek was submitted by Mr. Nick Vande Hey. The basis for that objection was stated as the possible financial implications to the community if costly modifications were needed for the Wastewater Treatment Facility to meet the effluent limitations associated with a revised use designation.

I encourage you, your staff, and/or consultants to review the Department's file information regarding this receiving stream. We believe these data clearly support the fact that the stream can support a more viable biological community than was believed when the *Limited Aquatic Life* classification was promulgated. If you have additional information related to the biology, chemistry, or physical nature of this receiving stream, we would be happy to discuss those data with you. As part of our required standards review, we must review the data in hand and move forward to assign an appropriate use designation. Any

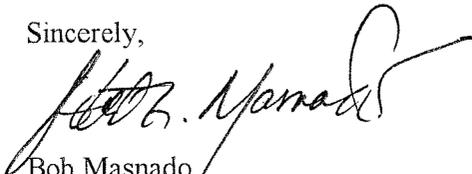
supplemental data that you provide that meets the requisite quality conditions will be considered in this assessment.

Currently, Department staff are reviewing all classification files to ensure that any proposed changes to existing classifications are sensible and supported by the available data. We feel this is necessary to be in a position to support any future challenges to our recommended classification changes that may result from additional review by the public and the regulated community alike. This comprehensive review is taking longer than anticipated and has delayed our efforts to bring a proposed rule revision to the Natural Resources Board (the Board). When our efforts are complete and we do appear before the Board, I can assure you that we will only be requesting permission to take the rule package back out for public comment. I have heard that there are some folks who think our next appearance before the Board is to seek final approval of the revised rules. That is most definitely not the case and we will not attempt to seek final approval until we have received additional input through the public comment process.

Lastly, your current permit is in effect until 2008 having just recently been re-issued. Because your existing wastewater treatment plant is experiencing difficulty meeting current discharge limits and is nearing capacity, your new permit provides a compliance schedule for facility planning. The Cedar Grove facility will need to be upgraded regardless of the potential change in stream classification. It would be advisable to consider potential changes to the NR 104 classification as facility planning proceeds as you may find that this provides you with an opportunity to consider a range of alternatives that could be employed should there be changes in water quality standards or stream classification.

I hope this letter provides you with a "status report" related to the proposal to re-classify Barr Creek. At this point in time, the data in hand support a classification of *Limited Forage Fish* (Headwaters to River Mile 2.1) and *Warmwater Forage Fish* (River Mile 2.1 – Lake Michigan), but that proposal has not been finalized yet. As mentioned above, I look forward to working with you and your community's representatives to understand the basis for any recommendation made about the proposed use of Barr Creek. If you have any questions or continued concerns over this matter, please don't hesitate to contact me at (608) 267-7662 or Vic Pappas at (920) 892-8756 extension 3012.

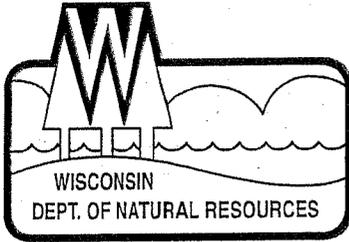
Sincerely,



Bob Masnado  
Water Quality Standards Section

Enclosures

Cc: Laura Bub – WT/2  
Vic Pappas – SER (Plymouth)  
Steve Galarneau – SER (Plymouth)  
Curt Nickels – SER (Plymouth)  
Patrick Vander Sanden – Room 409 South - State Capitol



# State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Scott McCallum, Governor  
Darrell Bazzell, Secretary

101 S. Webster St.  
Box 7921  
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December 2, 2002

Amy Vaclavik  
McMahon Associates, Inc.  
1445 McMahon Drive  
P.O. Box 1025  
Neenah, WI 54957

Subject: Barr Creek Classification

Dear Ms. Vaclavik:

You recently inquired about the status of the Barr Creek classification, including whether the classification will be changed, when this change might occur, and what effect anticipated classification changes could have on effluent limits for the Village of Cedar Grove wastewater treatment facility.

Barr Creek is currently classified as Limited Aquatic Life (LAL) in ch. NR 104 (Wis. Adm. Code). The proposed revisions in the December 1998 Green Sheet package pertaining to stream classification (which we consider Phase I of 2 phases) list the classification for Barr Creek as remaining classified as LAL until December 31, 2005, with a change in classification to Limited Forage Fish (LFF) occurring on January 1, 2006. However, since the time that information was prepared for the December 2001 Green Sheet Package, additional data collections and analyses have been conducted on Barr Creek. Based on this information, a recommendation is being made to Department Administration for Barr Creek to be classified as Limited Forage Fish (LFF) in the headwaters reaches, and Fish and Aquatic Life (FAL) from the confluence with an unnamed creek downstream to Lake Michigan. The segment of Barr Creek that Cedar Grove wastewater facility discharges to, is recommended to be classified as FAL. For your reference, I am enclosing a copy of the most recent (December 2002) Stream Classification Report for Barr Creek. If you have specific questions about the classification report, please contact Steve Galarneau, Water Resources Management Specialist in Southeast Region, at (920) 892-8756, ext. 3051.

This recommended change in classification would be dealt with in the second phase of our revision process. At this time, it is uncertain when Phase II of the proposed revisions to NR 102, NR 104, and NR 106 will be completed and promulgated. We are hopeful that Phase I revisions will be completed by the end of 2003, with a more intense focus on Phase II issues following the completion of Phase I.

A change in classification from LAL to FAL would result in changes in effluent limitations. The table below illustrates how effluent limits would potentially differ between LAL and FAL classifications.

	Limited Aquatic Life (LAL)	Fish and Aquatic Life (FAL)
Biological Oxygen Demand (BOD)	20 mg/L monthly avg. 30 mg/L weekly avg.	5 mg/L weekly avg. (summer) 10 mg/L weekly avg. (winter)
Total Suspended Solids (TSS)	20 mg/L monthly avg. 30 mg/L weekly avg.	10 mg/L monthly avg.
Ammonia	None	0.9 mg/L weekly avg. (summer) 4.8 mg/L weekly avg. (winter)
Dissolved Oxygen (DO)	4 mg/L daily minimum	7 mg/L daily minimum

You should be aware that the Department is actively pursuing a change in the water quality standards for ammonia and that those standards may be promulgated as early as Fall 2003. When the revised ammonia standards are promulgated, ammonia limits would be calculated to reflect the use designation of the receiving water as well as the ambient pH. It would be premature to speculate with certainty what those limitations may be since the Advisory Committee for that effort has not yet finished its work. However, applying the current thinking of the Advisory Committee with a an estimated pH of 7.9, ammonia limits would include summer limits of 3.6 mg/L weekly average and 1.4 mg/L monthly average; and winter limits of 7.0 mg/L weekly average and 2.8 mg/L monthly average.

It is also likely that an effluent limit would be set for pH, and weekly average pH values would need to fall in the range of 6.0-7.9. Final determination of all revised effluent limitations would eventually be determined by the Southeast Region Effluent Limits Calculator. Currently, that responsibility lies with Jackie Fratrick who can be reached at (262) 574-2135.

When the classification of Barr Creek is formally changed, the effective date of modified effluent limits would be determined based upon the ability of the treatment plant to meet those limits. Typically, if the plant can indeed meet the new limits, those limits would be included in the initial WPDES permit reissued after the formal use designation change. If a plant cannot meet the new limits, a compliance schedule to do so would most likely be included in the first permit issued following the use designation change.

I hope that this information clarifies some of the questions that you have regarding the impact of a classification change on the Village of Cedar Grove wastewater treatment facility. If you have any additional questions, please contact me at (608) 261-4385 or [laura.bub@dnr.state.wi.us](mailto:laura.bub@dnr.state.wi.us).

Sincerely,



Laura Bub  
Water Quality Standards Specialist

Enclosure

Cc: Bob Masnado – WT/2  
Jim Schmidt – WT/2  
Steve Galarneau – SER/Plymouth  
Curt Nickels – SER/Plymouth  
Jackie Fratrick – SER/Waukesha  
Jim Fratrick –SER/Milwaukee

V. of Cedar Grove  
Barr Creek

LAL

LFF

fr. Jim  
Schmidt  
12-02

BOD

20 monthly  
30 weekly

15 monthly  
30 maximum

TSS

same

20 monthly  
30 maximum

AMMONIA

none

depends on max. pH  
based on 7.9:  
draft rules

17 mg/L max.

9 weekly

3.5 monthly

currently

3 weekly summer

6 winter

~~for BOD TSS?~~

DEC - 9 2002

FISH AND AQUATIC LIFE DESIGNATED USE FORM  
(Attach supporting data sheets)

WATERBODY NAME Barr Creek WBIC# 50200

REGION SER BASIN Sheboygan COUNTY Sheboygan

Segment 1 Shown on Sheboygan Falls and Cedar Grove. Segment 2 Shown on Cedar Grove Quad. Maps

Reference

Site(s) \_\_\_\_\_

Attach class. form for ref. site/cond.

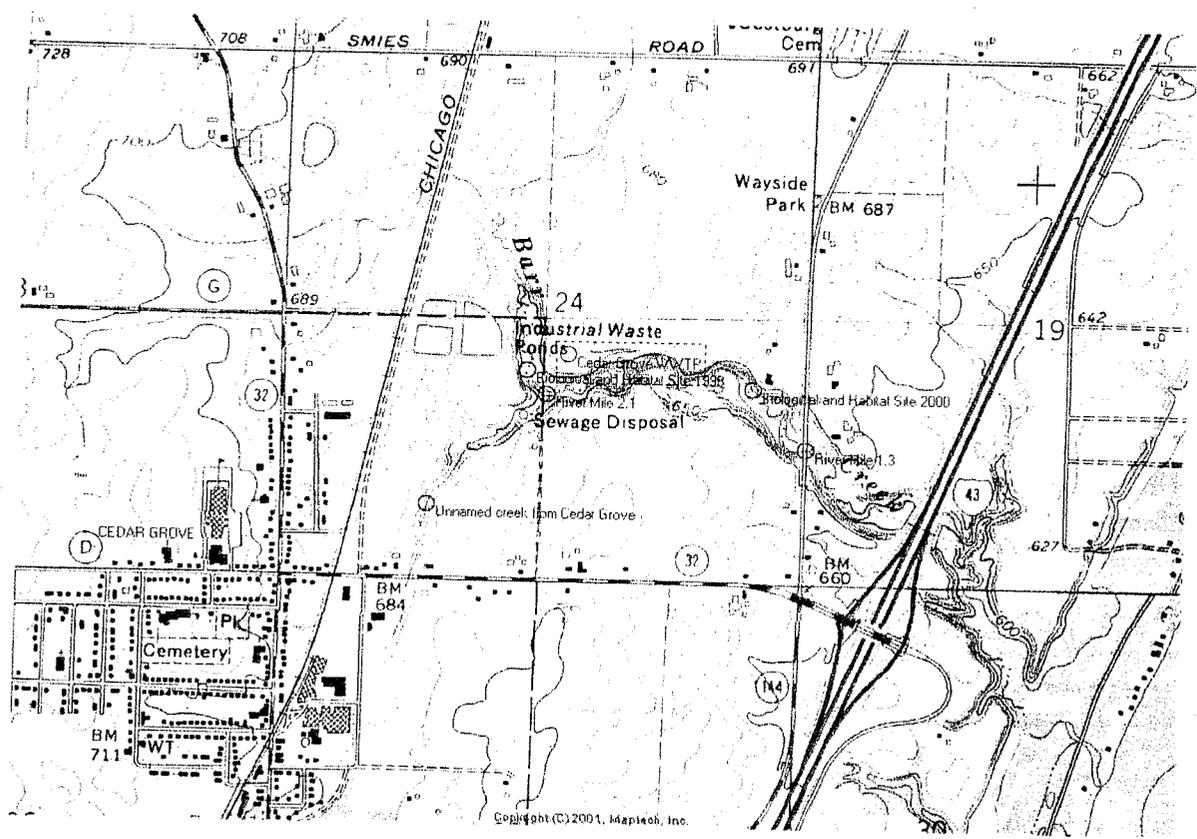
SEGMENT DESCRIPTION for Segment 1 of 2 (headwater = segment 1)

From: Northwest of Oostburg south towards Cedar Grove then turns easterly north-northeast of Cedar Grove. River mile 7.2 to 2.1.	lat/long	tn, rng, ¼, ¼, section T13N R22E SESE Sec.1
To: The confluence with an unnamed creek from Cedar Grove at River Mile 2.1.	lat/long	tn, rng, ¼, ¼, section T13N R22E NWSE Sec. 24

SEGMENT DESCRIPTION for Segment 2 of 2 (headwater = segment 1)

From: The confluence with an unnamed creek from Cedar Grove at River Mile 2.1.  downstream _____ mi., km., ft., M.	lat/long	tn, rng, ¼, ¼, section T13N R22E NWSE Sec. 24
To: The mouth of Barr Creek at Lake Michigan (i.e. River Mile 0.0).	lat/long	tn, rng, ¼, ¼, section T13N R23E SWNE Sec. 30

Map 1. Locations of the recent biological and habitat surveys on Barr Creek, Cedar Grove Wastewater Treatment Plant, and stream miles for LFF and FAL stream classification.



**DESIGNATED USE INFORMATION:**

New Classification \_\_\_\_\_, Standards Review X, Ref. Site \_\_\_\_\_, Date field work conducted/completed 10/5/1994, 8/16/1999, 10/20/1999, 12/2/1999, 7/13/2000, 11/27/2000, 9/24/2002

Current FAL Designated use as per NR 104 - LAL, Date 1979 (attach)

Existing FAL Use Based on current data LFF from river mile 7.2 to 2.1 and FAL from river mile 2.1 to Lake Michigan, Date 12/6/2002

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Recommended Attainable Designated use LFF from river mile 7.2 to 2.1 and FAL from river mile 2.1 to Lake Michigan

Seasonal Designated use(s)/Dates \_\_\_\_\_

Other Applicable Uses: ORW\_\_\_\_, ERW\_\_\_\_, GL\_\_\_\_, GLS\_\_\_\_, Drinking Water Supply\_\_\_\_,

Recreation\_\_\_\_, Wild Life\_\_\_\_

Submitted By: <u>Steve Galarneau</u>	Date: <u>12/6/2002</u>
Reviewed By:	Date:
Approved Basin Leader:	Date:
WQS Sect. Chief, or Designee:	Date:

**DISCHARGER INFORMATION:**

Municipality/Company Cedar Grove WWTP, Permit # \_\_\_\_\_

Outfall Location T13N R22E NWSE Sec. 24 just downstream of confluence with unnamed creek from Cedar Grove at River Mile 2.1

Contact Person \_\_\_\_\_, Contact Date(s) \_\_\_\_\_

Did A Representative Observe Field Work? No X, Yes \_\_\_\_\_,

Representative Name \_\_\_\_\_, Date(s) \_\_\_\_\_

Comments about facility, representative's observations, etc.:

Water Body Name Barr Creek, WBIC# 50200  
Date 12/6/2002

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**BASIS FOR DESIGNATED USE DECISION** (List and briefly discuss key elements for the decision)

Barr Creek was originally classified as a non-continuous marginal fish and aquatic life stream (Limited Aquatic Life) in 1979. The 1979 classification was proposed without the benefit of any widely accepted and scientifically based stream classification guidelines, or the use of recent biological information (i.e. fish survey results). Limited Aquatic Life is the existing classification in NR 104.

In 1986 and 1987, a wasteload allocation survey and waste assimilative model was completed for two discharges to Barr Creek, the Larson Company and Cedar Grove wastewater treatment plant. This survey and model was used to predict the combined waste assimilative capacity of Barr Creek and their effects on stream water quality. Concurrent with this survey, a stream classification survey was completed according to the 1982 *Stream Classification Guidelines for Wisconsin*. Based on the results of the 1986 stream classification survey, it was recommended in 1996 that Barr Creek be classified as a Limited Forage Fish Communities stream.

The stream classification for Barr Creek is being refined based on additional physical and biological data collected in 1999 and 2000, chemical toxicity data collected in 2002, and application of the current *Guidelines for Designating Fish and Aquatic Life Uses for Wisconsin Surface Waters* (draft July 2002). **Barr Creek should be classified as Limited Forage Fish from it's headwaters downstream to the confluence with an unnamed creek at river mile 2.1 (T13N R 22E Sec24 NWSE) and Full Fish and Aquatic Life – Warmwater Forage Fish downstream from river mile 2.1 to Lake Michigan.**

Aquatic Surveys

Recent fish and habitat data were collected in Barr Creek upstream (1999) and downstream (2000) of the effluent discharge from Cedar Grove Wastewater Treatment Plant. A total of fifteen species of fish have been collected from Barr Creek over the years. The rainbow trout, alewife, lake chub, and spottail shiner are not resident of Barr Creek, but are indicative of the migration of Lake Michigan species into Barr Creek on a seasonal basis. A summary of the fish species collected in Barr Creek is shown in Table 1.

**Table 1. Barr Creek Fish Community**

Fish Species	Historical Fish Collections Fago (1985)	Downstream of I43 at RM 0.9 1986	Upstream of Smies Road at RM 2.9 1986	Upstream of Cedar Grove WWTP Access Rd. at RM 2.2 8/16/1999	Upstream of Sauk Trail Road at RM 1.4 10/5/1994	Upstream of Sauk Trail Road at RM 1.4 7/13/2000
Black Bullhead	X					X
Brassy Minnow	X					
Brook Stickleback	X		X	X	X	
Central Mudminnow	X	X		X	X	X
Common Carp		X				
Common Shiner		X				
Creek Chub	X	X		X	X	X
Fathead Minnow	X	X	X		X	X
Green Sunfish						X
Lake Chub	X					
Alewife						X
Spottail Shiner						X
Bluntnose Minnow						X
Rainbow Trout	X					
White Sucker	X	X	X	X	X	X

The results of a 1999 fish survey in Barr Creek, upstream of the confluence with the unnamed creek (flowing north from Cedar Grove), included four species of fish all considered tolerant to degraded environmental conditions with 84% of the forage fish belonging to species that are tolerant to low dissolved oxygen. The macroinvertebrate community from the same site was predominately aquatic insects tolerant of low dissolved oxygen (75%). Instream habitat conditions were evaluated using the Fish Habitat Rating for small streams (Simonson et al. 1994). The overall habitat score was "good" (FHR score 58). The stream reach upstream of the Cedar Grove WWTP outfall is naturally limiting due to flow and water depth and is suitable to sustain a tolerant to very tolerant biological community. During the water chemistry sampling in 1994, water samples could not be collected on four dates at Walvoord Road (river mile 3.2) due to the lack of water.

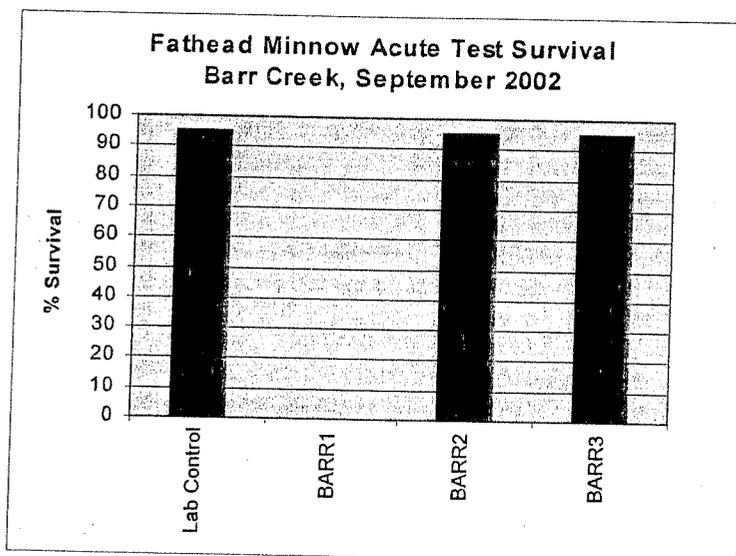
A July 2000 fish survey in Barr Creek conducted 180 meters (approximately 1/10<sup>th</sup> mile) upstream of Sauk Trail Road resulted in nine species of fish with 45% of the forage fish community consisting of species tolerant to low dissolved oxygen. Macroinvertebrate samples collected in 1999 and 2000 downstream of the Cedar Grove WWTP discharge consisted of 67% and 71% (respectively) of aquatic insects tolerant to low dissolved oxygen. The instream fish habitat rating for this reach also rated "good" (FHR score 58). The habitat in this stream reach consists of more pools and deeper runs. The habitat is suitable to sustain a diverse fish and aquatic life community, including seasonal migration of fish from Lake Michigan. Fish Index of Biotic Integrity ratings (Lyons 1992) summary data are in Appendix 1.

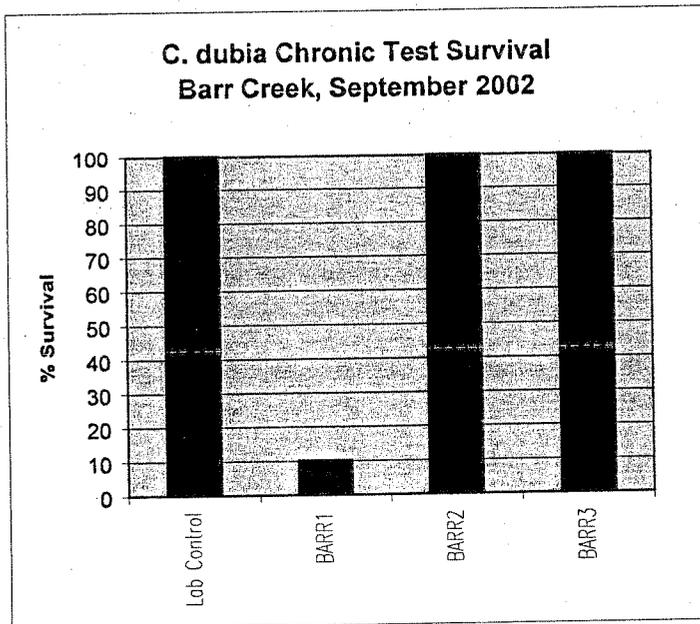
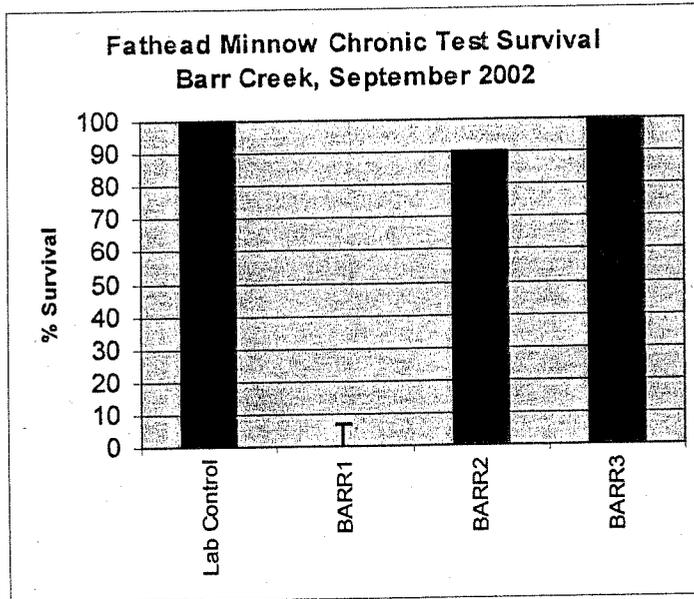
In September 2002 WDNR collected water and sediment samples from three locations in Barr Creek for toxicity testing. Samples were collected upstream of the confluence with the unnamed tributary to Barr Creek (upstream of the access road to the Cedar Grove WWTP) (BARR3), upstream of Cedar Grove WWTP outfall but downstream of the confluence with the unnamed creek from Cedar Grove (BARR2) and downstream of the Cedar Grove WWTP outfall (BARR1).

Toxicity tests were completed by the University of Wisconsin-Madison's State Laboratory of Hygiene (SLH) with samples collected in September 2002 from Barr Creek. Acute and chronic screen tests were performed on undiluted water from each site.

No significant acute or chronic toxicity was noted in Barr Creek samples labeled BARR2 and BARR3. However, acute toxicity to the fathead minnow (0% survival) and chronic toxicity to the fathead minnow (0% survival, 0 growth) and *Ceriodaphnia dubia* (10% survival, 0 reproduction) was noted in BARR1 samples. This toxicity may have been at least partially due to ammonia, which was measured at 13.6 mg/l.

Figures 1-3. Barr Creek acute and chronic toxicity tests. Samples collected on September 24, 2002.





It is evident from the water toxicity data depicted in the graphs above that the water quality downstream of the Cedar Grove WWTP outfall is adversely impacting the fish and aquatic life in Barr Creek. Despite these stresses, a resident population of forage fish and seasonal migration of Lake Michigan fish species were observed during the fish survey in July 2000 and historical fish surveys. The water quality in Barr Creek downstream of the Cedar Grove WWTP is preventing the fish and macroinvertebrate community from fully meeting its potential biological use. A more abundant, diverse, and healthy fish and aquatic life community can be supported by the existing habitat if water quality were improved.

Water Body Name Barr Creek, WIBC# 50200, Date 12/6/2002

**Send final report to:**

Facility \_\_\_\_\_ Date: \_\_\_\_\_

Basin Wastewater Eng. \_\_\_\_\_ Date: \_\_\_\_\_

Limits Calculator: \_\_\_\_\_ Date: \_\_\_\_\_

Watershed Expert \_\_\_\_\_ Date: \_\_\_\_\_

Fish and Habitat Expert \_\_\_\_\_ Date: \_\_\_\_\_

Other interested parties (list) \_\_\_\_\_ Date: \_\_\_\_\_

**LITERATURE REVIEW**

Ball, Joseph. 1982. Stream Classification Guidelines for Wisconsin. Technical Bulletin. Wisconsin Department of Natural Resources, Madison, Wisconsin.

Fago, Donald. 1984. Distribution and Relative Abundance of Fishes in Wisconsin. Volume 1. Fox (IL) River Basin. Technical Bulletin No. 136. Wisconsin Department of Natural Resources, Madison, Wisconsin.

Lyons, John. 1992. Using the Index of Biotic Integrity (IBI) to Measure Environmental Quality in Warmwater Streams of Wisconsin. North Central Forest Experiment Station, Forest Service - U.S. Department of Agriculture. St. Paul, MN.

Simonson, T., J. Lyons and P. Kanehl. 1994. Guidelines for Evaluating Fish Habitat in Wisconsin Streams. U.S. Dept. of Agriculture, Forest Service, North Central Forest Experimental Station. General Technical Report NC-164. St. Paul, MN.

WDNR. 1979. Stream Classification for Cedar Grove. Wisconsin Department of Natural Resources, Southeast Region, Milwaukee WI.

WDNR. 1986. Stream Classification for Cedar Grove. Wisconsin Department of Natural Resources, Southeast Region, Milwaukee WI.

Water Body Name Barr Creek, WIBC# 50200, Date 12/6/2002

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### PHYSICAL/CHEMICAL DATA

Habitat data sheets are available for the 1999 and 2000 surveys. The summary sheets are in Appendix 1.

### CHEMICAL DATA COLLECTED:

Water chemistry data are available from 1994, 1999 and 2000.

### BREIF INTERPRETATION/COMMENTS:

### BIOLOGICAL DATA

**FISH:** Sampling date 7/13/2000 Attach species list and IBI forms if applicable

Survey Location(s) 180m upstream of Sauk Trail Road

Distance sampled 135m Sampling Gear Backpack Shocker

No. of species 9, Total fish 184,

No. of species not listed as tol. to low DO 101, Total fish 183, % not listed 55%

**MACROINVERTEBRATES:** Sampling date 11/27/2000, HBI 6.105 (Fair)

Survey location(s) upstream of Sauk Trail Road

Sampling Procedure D-frame kicknet

> 100 organisms found, attach taxonomy bench sheet or other analyses:  
See attached.

% individuals with HBI value 5 or less 29%

### OTHER BIOLOGICAL DATA/OBSERVATIONS:

Additional fish and macroinvertebrate surveys conducted in 1994 and 1999. Toxicity tests conducted on Barr Creek in September 2002. See attached stream classification report.

### INTERPRETATIONS BASED ON EXISTING FISH AND AQUATIC LIFE COMMUNITY:

Barr Creek should be classified as LFF from its headwaters at river mile 7.2 downstream to the confluence with an unnamed creek at river mile 2.1 and FAL from there (river mile 2.1) downstream to Lake Michigan.

Water Body Name Barr Creek, WIBC# 50200, Date 12/6/2002

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**THIS PAGE MUST BE COMPLETED WHEN THE RECOMMENDED DESIGNATED USE IS TOLERANT FISH AND AQUATIC LIFE (LFF) VERY TOLERANT AQUATIC LIFE (LAL).**

RECOMMENDED DESIGNATED USE LFF from headwaters down to river mile 2.1

**Tolerant and Very Tolerant Designated uses**

Tolerant Fish and Aquatic Life and Very Tolerant Aquatic Life designated uses are not defined as full fish and aquatic life uses. In most cases an TFAL or VTAL use is the best that can be attained by these resources due to natural habitat or water quality limitations. A designated use recommendation into one of these sub-categories must be based on one or more of the following factors (s. 283.15(4), Stats.). Check all that apply to this designated use and provide a brief description of the situation:

- a. Naturally occurring pollutant concentrations prevent the attainment of a full fish and aquatic life community.
- b. Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of a full fish and aquatic life community, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating water conservation requirements.
- c. Human caused conditions or sources of pollution prevent the attainment of a full fish and aquatic life community and cannot be remedied or would cause more environmental damage to correct than to leave in place.
- d. Dams, diversions or other types of hydrologic modifications preclude the attainment of a full fish and aquatic life community, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of a full fish and aquatic life community.
- e. Physical conditions related to the natural features of the water body, such as the lack of proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of a full fish and aquatic life community.

**Fish Habitat Form -  
Streams (<10m wide)**

Stream Name:	Barr Creek
WBIC	50200
Location:	69 m upstream of Cedar Graove WWTP access road
Date:	08/16/1 999
TRSQQ	T13N R22E Sec. 24 NESW
Lat	
Long	
Datum	
Stream Mile	2.2

RATING ITEM	score mean	Overall rating
Riparian Buffer Width	15 Excellent	58 Good
Bank Erosion	5 Fair	
Pool Area	3 Fair	
Width:Depth Ratio	10 Good	
Riffle:Riffle or	10 Good	
Bend:Bend Ratio		
Fine Sediments	5 Fair	
Cover for Fish	10 Good	

Habitat Transect Length =  Distance from start of the final transect.

Station Length =

Percent of riffles	12
Percent of pools	11
Percent of runs	77

**Fish Habitat Form -  
Streams (<10m wide)**

Stream Name:	Barr Creek
WBIC	50200
Location:	180 m upstream of Sauk Trail Road
Date:	07/13/2 000
TRSQQ	T13N R22E Sec. 24 NESE
Lat	
Long	
Datum	
Stream Mile	1.4

RATING ITEM	score mean	Overall rating
Riparian Buffer Width	15	58 Good
Bank Erosion	5	Excellent
Pool Area	3	Fair
Width:Depth Ratio	10	Good
Riffle:Riffle or	15	Excellent
Bend:Bend Ratio		nt
Fine Sediments	5	Fair
Cover for Fish	5	Fair

Habitat Transect Length =  Distance from start of the final  
transect.

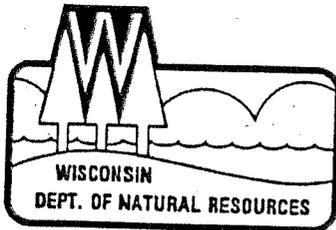
Station Length =

Percent of riffles	12
Percent of pools	24
Percent of runs	63





→ Paulette Harder - WT/



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Tommy G. Thompson, Governor  
George E. Meyer, Secretary  
Gloria L. McCutcheon, District Director

Southeast District Headquarters  
2300 N. Dr. ML King, Jr. Drive, Box 12436  
Milwaukee, WI 53212-0436  
TELEPHONE 414-263-8500  
FAX 414-263-8483  
TDD 414-263-8713

December 23, 1996

The Honorable Glenn Grothman  
State Representative  
Wisconsin State Assembly  
P.O. Box 8952  
Madison, Wisconsin 53708-8952

Dear Representative Grothman:

Thank you for November 27, 1996 letter regarding the Department's 1986 stream classification for Barr Creek in Sheboygan County. I can certainly understand your concerns over the potential fiscal impacts to the Village of Cedar Grove Wastewater Treatment Plant. You requested that the Department review the appropriateness of the stream classification for Barr Creek with some consideration of the stream classification's fiscal impact on the Village of Cedar Grove.

A previous Department correspondence to Steve Krieser of your staff dated September 6, 1996 described the Wisconsin Stream Classification System and summarized the history of stream classifications for Barr Creek. I have enclosed a copy of that correspondence for your use. Barr Creek was previously classified in 1979 as a non-continuous marginal fish and aquatic life stream (*Limited Aquatic Life*). This classification was proposed without the benefit of any widely accepted and scientifically based stream classification guidelines, or the use of recent biological information. Water quality standards and effluent limits for streams classified as *Limited Aquatic Life* are more appropriately assigned to prevent development of nuisance septic and malodorous conditions than to protect fish and other less tolerant aquatic life.

In 1986, staff reviewed the stream classification for Barr Creek and concluded that the *Limited Aquatic Life* classification was inappropriate. Staff recommended that Barr Creek be reclassified as a *Limited Forage Fish Community* based on existing and potential biological communities and habitat. Between 1976 and 1994, ten species of fish have been collected from Barr Creek. Resident fish species include white sucker, creek chubs, fathead minnows, central mudminnows, brook stickleback, common shiners, brassy minnow, black bullhead, lake chub. Carp, while present, are not present in dominant numbers. Like many other small tributaries to Lake Michigan, Barr Creek does have the potential for providing a seasonal recreational fishery for rainbow trout. Although rainbow trout are not resident to Barr Creek they can migrate into Barr Creek from Lake Michigan during their spring and fall migration. The seasonal population of rainbow trout was not a significant reason for reclassifying the biological use of Barr Creek.

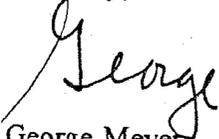


The proposed classification for Barr Creek, supporting water quality standards and effluent criteria are not effective until such time that Administrative Code NR 104 is formally promulgated. Department staff are currently working with an external advisory group to revise and update NR 104. That advisory committee includes representatives of industrial and municipal dischargers, engineering consultants and experts in the field of water quality. The committee has met on several occasions to review the direction stream reclassifications should take. To date, most of the time has been spent on reviewing and updating the publication you referenced in your letter to me, Stream Classification Guidelines for Wisconsin. The concerns relayed to you by the Village of Cedar Grove are the very type being discussed by the committee. While there are not a great number of communities in the same situation as Cedar Grove, there are enough to warrant a state-wide approach to dealing with the issues raised by reclassification of a stream. We expect the work of that committee to extend through much of 1997.

It is only after the committee completes its work the Department will be in a position to formally propose a change to any stream classification. Such a stream classification would be in the form of administrative rule amendment adopted by the Natural Resources Board and reviewable by the Legislature. Any community that would be subject to a change in stream classification will be given ample notice of the proposed change and both informal and formal opportunities to provide input into the decision, including an appearance before the Natural Resources Board.

Mr. William Wawrzyn of our Southeast regional staff will be happy to answer any specific questions you may have. Will can be reached at 414-263-8699. Thank you again for contacting me with your concerns.

Sincerely,



George Meyer  
Secretary

Date 12/13/2001

Facility Name Village of Cedar Grove

Receiving Water Barre Creek, Stebbins Cr. Union =

Evaluated by W. J. ...

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

The discharger is no longer at this location.

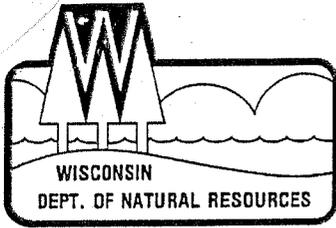
A new classification has resulted in a full fish and aquatic life designation.  
New survey date \_\_\_\_\_ Please provide copy of new classification report.

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

REVISE CLASSIFICATION TO LFF  
DELETE UNION FIELDS AS DISCHARGER AS THEY HAVE  
ABANDONED THEIR TRILLION AND DISCHARGE.  
REMAINING DISCHARGE IS VILLAGE OF CEDAR GROVE  
WWTP. RPT COMPLETED IN MARCH 1997

Other (please explain)

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



## State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Tommy G. Thompson, Governor  
George E. Meyer, Secretary  
Gloria L. McCutcheon, District Director

Southeast District Headquarters  
2300 N. Dr. ML King, Jr. Drive, Box 12436  
Milwaukee, WI 53212-0436  
TELEPHONE 414-263-8500  
FAX 414-263-8483  
TDD 414-263-8713

September 6, 1996

Steve Krieser  
c/o The Honorable Glenn Grothman  
Wisconsin State Assembly  
P.O. Box 8952  
Madison, Wisconsin 53708-8952

Dear Mr. Krieser:

This letter is in response to our August 29, 1996 telephone conversation regarding the Department of Natural Resources stream classification for Barr Creek in Sheboygan County. During our conversation, I briefly discussed the objectives of Wisconsin's Stream Classification system, and the use of stream classifications in assigning supporting water quality standards and setting effluent limits for wastewater discharges. We both agreed it would be useful for me to provide you additional information on Wisconsin's Stream Classification system, and specific stream classification information pertaining to Barr Creek in Sheboygan County.

### Wisconsin Stream Classification System

The Wisconsin Stream Classification System provides a basis for making and supporting water quality management decisions. Surface waters require classification as part of Wisconsin's codified water quality standards so that water quality criteria for specific waters, and point source discharge effluent limits needed to maintain water quality standards, can be designated and regulated. Written guidelines for classifying Wisconsin's streams were first developed in 1982, "Stream Classification Guidelines For Wisconsin". Although these procedures were developed primarily for designating stream uses, they can be applied to any surface water for the purpose of designating water quality standards.

The Wisconsin's Stream Classification system describes the potential biological use of Wisconsin stream's. Although stream's can be used for a variety of uses (i.e. recreation, food production, and wastewater assimilation), only those uses which can be described in terms of biological communities are considered. *Use* is defined by the biological community a surface water has the natural capacity to support. The stream classification system recognizes that not all stream have the capacity to support all forms of fish and other aquatic life communities due to natural limiting factors (i.e. stream size and depth, and water temperature), or culturally irreversible factors (i.e. dams and channelization). The differences in natural water quality and habitat can be measured or predicted and, along with biological data, form the basis for classifying surface waters into their appropriate biological use classifications.

The use classification in this system is also based on a surface water's *potential* to support a community type, (i.e., warm water sport fish), not necessarily on its *existing* biological community. Use classification based only on existing conditions could perpetuate non-attainment of potential uses by allowing continued discharge of inadequately treated effluent, and could inhibit efforts to manage other water quality problems such as nonpoint source sediment and nutrient impacts.

*Existing use* is defined by the fish and other aquatic life community currently living in a stream. The existing use is dependent upon current habitat and water quality conditions, and any natural or cultural impacts that may or may not be controllable. The existing use may or may not be the same as the classified use depending on the controllability of water quality and habitat impacts. *Potential use* is the fish and other aquatic life community that could exist in a stream following the removal or management of controllable impacts. The potential use can be different from the existing use where controllable impacts have degraded habitat or water quality to the point that few fish and other aquatic life exist in a stream. Potential use is based on a stream's capacity to improve when controllable impacts are removed or properly managed. A stream's potential use is its designated classification and sets the standards for deriving water quality criteria and for calculating effluent limits needed to attain water quality standards *and* the potential use.

Wisconsin's existing fish and other aquatic life use classes are codified in Administrative Code NR 102.04(3) as follows:

**Great Lakes Communities:** This subcategory includes Lake Superior, Lake Michigan and Green Bay including all bays, arms and inlets and those tributaries which serve as spawning areas for anadromous fish species.

**(Class A) Cold Water Communities:** Surface waters capable of supporting a community of cold water fish and other aquatic life, or serving as a spawning area for cold water fish species. This classification includes, but is not restricted to, surface waters identified as trout water in *Wisconsin Trout Streams*, publication 6-3600(80). Stream flow will generally be continuous and stable due the direct aquifer water source. An important factor in designating this use class is the potential maximum daily mean temperature which should be approximately 71°F. In addition, good quality cold water streams will generally not completely freeze over in winter due to ground water temperatures remaining above freezing. Cold water streams will typically have the potential to maintain good water quality, and to at least contain habitat sufficient to support intolerant macroinvertebrates and cold water forage fish species. Streams that periodically meet cold water communities classification criteria can be seasonally classified as cold water streams. Seasonal classification is defined in the special situation section of these procedures. Some plant species, such as true water cress (*Rorippa nasturtium-aquaticum*) may indicate cold water conditions.

**(Class B) Warm Water Sport Fish Communities:** Surface waters capable of supporting a community of warm water sport fish or serving as a spawning area for warm water sport fish. The major factors in designating a warm water sport fish community classification are temperature and stream flow. Temperature separates warm water from cold water streams in that maximum stream temperature is related more to air temperature than to source water temperature. Warm water streams generally freeze over in the winter, and water temperatures vary greatly from just above freezing up to a

summer maximum of about 89° F. Stream flow, or stream size, is a major factor because flow and depth (habitat) must be sufficient to support relatively large fish.

**(Class C) Warm Water Forage Fish Communities:** Surface waters capable of supporting an abundant and diverse community of intolerant forage fish and other aquatic life, or a valuable population of tolerant forage fish. The characteristics of these streams are similar to those which support Warm Water Sport Fish in that they have natural water quality and habitat sufficient to support forage fish and other aquatic life. However, they may be too small to support cold or warm water sport fish.

**(Class D) Limited Forage Fish Communities:** Surface waters of limited capacity and naturally poor water quality or habitat. These surface waters are capable of supporting only a limited community of aquatic life. Limited forage fish surface waters are generally small streams or shallow water bodies containing naturally poor water quality or habitat. Limited forage fish streams may maintain a small continuous flow year round, but can periodically become non-continuous in dry periods.

**(Class E) Limited Aquatic Life:** Surface waters of severely limited capacity and naturally poor water quality or habitat. Limited aquatic life surface waters have no potential to support even a few fish, and have limited potential to support other fully aquatic life forms. When aquatic insects are present they are usually the most tolerant species. These waters are usually limited by both naturally poor water quality and aquatic habitat. Streams or stream channels may be dry except during rainy periods, or may contain pooled water and little if any flow. Small, but continuous flowing streams with no instream cover for fish or aquatic insects may be appropriately classified as Limited Aquatic Life Communities. Small, continuous flowing streams containing some cover for fish and other aquatic life, but containing naturally severely degraded water quality may also be appropriately classified as Limited Aquatic Life Communities. Some examples of Limited Aquatic Life stream's include agricultural drainageway's, and urban stream's that have been enclosed in conduit or lined with concrete.

#### Stream Classification for Barr Creek, Sheboygan County

Barr Creek was previously classified in 1979 as a non-continuous marginal fish and aquatic life stream (Limited Aquatic Life). This 1979 classification was proposed without the benefit of any widely accepted and scientifically based stream classification guidelines, or the use of recent biological information (i.e. fish survey results).

In 1986 and 1987, a wasteload allocation survey and waste assimilative model was completed for two discharges to Barr Creek, the Larson Company and Cedar Grove wastewater treatment plant. This survey and model was used to predict the combined waste assimilative capacity of Barr Creek and their effects on stream water quality. Concurrent with this survey, a stream classification survey was completed according to the 1982 *Stream Classification Guidelines for Wisconsin*. Measurements of in-stream habitat characteristics and fish surveys were completed.

The results of the 1986 stream classification indicate that Barr Creek habitat is suitable to sustain a viable population of tolerant to very tolerant forage fish, and lesser numbers of tolerant sport fish. Habitat was generally rated as "fair". The results of fish surveys from 1986, and as early as

1976, confirmed this conclusion. The fish community was represented by seven species considered tolerant to very tolerant of degraded environmental conditions. Fish species included white sucker, creek chubs, fathead minnows, carp, central mudminnows, brook stickleback, and common shiners. Fish species collected in 1976 and 1978 also included brassy minnow, black bullhead, lake chub, and rainbow trout. The rainbow trout is not a resident of Barr Creek, but it along with other species of trout and salmon resident to Lake Michigan, probably migrate into Barr Creek on a seasonal basis. Due to natural limiting conditions (i.e. warm water temperatures), trout and salmon are not capable of reproducing in Barr Creek.

Based on the results of the 1986 stream classification survey, it was recommended that Barr Creek be classified as a Limited Forage Fish Communities. A subsequent Barr Creek fish survey in 1994 reinforced this stream classification.

For your information, I have enclosed a copy of the 1982 Technical Bulletin titled *Stream Classification Guidelines for Wisconsin*, and the 1986 stream classification report for Barr Creek. I hope this information is helpful. Should you have any questions, please call me at (414) 263-8699.

Sincerely,



Will Wawrzyn  
Water Resource Manger

attachments

cc: Sharon Gayan WR/SER  
Joe Ball WT/2  
Judy Gottlieb WW/SER

c:\ww\wr\grothman.996

2

STREAM RECLASSIFICATION FOR BARR CREEK  
BLACK RIVER SUBWATERSHED  
SHEBOYGAN RIVER BASIN  
March 1, 1987  
By Will Wawrzyn - WRM/SED

## INTRODUCTION

A stream reclassification was conducted for Barr Creek to determine the appropriate use designation based on the Stream Classification Guidelines for Wisconsin (Ball, 1982). This evaluation was conducted in order to potentially assign effluent limits for three point sources which discharge directly to Barr Creek or via an unnamed tributary. The three point sources include the following;

Larsen Co. Permit No. WI-0000442-4  
Discharge cannery process waste directly to Barr Creek in and cooling water to an unnamed tributary in the Village of Cedar Grove.

Village of Cedar Grove Permit No. WI-0020711-3  
Discharge municipal wastewater directly to Barr Creek in Cedar Grove.

Medalist State Foundry Permit No. WI-003745-3 (General Permit)  
Discharge non-contact cooling water to an unnamed tributary of Barr Creek in the Village of Cedar Grove.

## Previous Water Quality Studies and Stream Classification

Barr Creek was previously classified in 1979 as a non-continuous, marginal fish and aquatic life stream (MAR-E) (WDNR, 1979). No formal stream classification has been completed for the unnamed tributary to Barr Creek. Marginal effluent limits currently apply for the Village of Cedar Grove POTW. Effluent limits for the Larsen Co. discharge are allocated by the 26# Rule minus the Village of Cedar Groves POTW allocation.

Two wasteload allocation studies have been completed for Barr Creek. The earlier study was completed in 1973 while the Village of Cedar Grove POTW was discharging to Barr Creek via the unnamed tributary. The most recent study was completed in the spring of 1986. This study was completed following the construction of the new Village of Cedar Grove POTW. The POTW currently discharges directly to Barr Creek, approximately 0.30 miles downstream of the Larsen Co. discharge and 0.15 miles downstream of the unnamed tributary (WDNR, 1979 and 1986).

## DESCRIPTION OF THE WATER RESOURCE

Barr Creek is a small stream located in southeastern Sheboygan County (Figure 1). The creek drains approximately 7 mi<sup>2</sup> and originates as surface runoff and from small tracts of wetlands before it discharges to Lake Michigan at T13N, R23E, Sec. 30. No Q7,2 or Q7,10 data is available for Barr Creek. The USGS topographic map has delineated Barr Creek as being intermittent. Therefore, it may be assumed that the Q7,10 is < 0.1 cfs. Stream gradient between the Larsen Co. outfall and I-43 (1.45 miles) is approximately 33 ft/mi.

Land use in the watershed is predominately agriculture in row crops. Runoff from adjacent and tributary fields may be significant. Runoff occurs from urban areas in the Village of Cedar Grove as well. Storm sewers drain industrial yards associated with the Medalist State Foundry.

### Water Quality

Extensive physico-chemical water quality data exists for Barr Creek as a result of the two wasteload allocation studies completed in 1973 and 1986 (WDNR, 1979 and 1986). Based on the results of these surveys, water quality is limited by low dissolved oxygen concentrations, and potentially acutely toxic concentrations of un-ionized ammonia. Discharges of carbonaceous and nitrogenous oxygen demanding pollutants contribute to low dissolved oxygen concentrations. High respiration rates from phytoplankton discharged from the Larsen Co. lagoons also contribute to low dissolved oxygen levels in the evening and supersaturated concentrations during daylight periods. Filamentous algae covers ~50% of the substrate upstream of the Larsen Co discharge and as a result, also contributes to low evening dissolved oxygen concentrations. This later filamentous algae growth is primarily restricted to upstream areas adjacent to the abandoned Larsen Co. wastewater lagoons. Further upstream (0.6 miles) at Smies Rd., no filamentous algae growth was observed. Historic physico-chemical water quality data is presented in Appendix 1.

### Biological Evaluation

Qualitative fish samples were collected from Barr Creek in 1976, 1978 and 1986 (Appendix 2). Fish samples collected at the mouth of Barr creek and 1.2 miles upstream of the mouth at I-43 in 1976 and 1978 were dominated by abundant populations of tolerant and very tolerant forage fish and fewer numbers of sport fish species. White suckers, central mudminnows, fathead minnows, black bullheads and brook sticklebacks were the dominant species. Species considered indigenous to Lake Michigan included rainbow trout (1) and the brassy minnow.

Fish samples collected at river mile 1.2 at I-43 in 1986 were also dominated by tolerant and very tolerant forage fish species. White suckers and creek chubs were the dominant species. Most of the white suckers collected were young-of-the-year (YOY) indicating that natural reproduction is occurring. One additional fish sample was collected at Smies Rd. in 1986. Fish populations were small. A 150' sample reach resulted in only 2 stickleback, 9 fathead minnows and 2 white suckers (YOY) being collected. This stream reach was significantly limited by sedimentation and a general lack of cover. Conversations with local residents, including Larsen Co. personnel, indicate that Barr Creek receives anadromous runs of salmonids during the spring and fall periods when stream flows are higher. Salmonids have been observed by these individuals as far upstream as the Larsen Co. outfall and beyond (> 2.7 river miles from the mouth). Schools of unspiciated fish fry were observed upstream of the Larsen Co. discharge while conducting the 1986 wasteload allocation study.

No macroinvertebrate samples have been collected from Barr Creek. Qualitative observations were made of the macroinvertebrate community during the 1979 stream classification survey and the 1986 wasteload allocation survey. Based on these observations, the macroinvertebrate community upstream and downstream of the various point sources is dominated by abundant populations of Asellus sp. and Simuliidae. Hirundinea and Hydropsychidae were observed to be rare to common beginning 1.5 miles downstream of the point sources at I-43. Chironomidae and Simuliidae were common upstream of the Larsen Co. discharge.

#### Habitat Evaluation

Habitat evaluations for Barr Creek were completed on May 21, 1986 and June 18, 1986 in conjunction with the wasteload allocation surveys (Appendix 3). In-stream flow conditions were representative of naturally occurring low-flow conditions exhibited by the stream. Stream flow was augmented by the combined discharge of the Larsen Co. and Cedar Grove POTW. Stream flows downstream of the wastewater discharges ranged from 1-1.45 cfs while ambient streams flows upstream of the combined discharges ranged from 0.05 cfs during the June 18, 1986 survey and 0.45 cfs during the May 21, 1986 survey.

In-stream habitat upstream of the Larsen Co. discharge was rated "poor" overall. Immediately upstream of the discharge, the stream is characterized as a shallow and meandering series of pools, riffles and runs. Bank failure, deposition <sup>of</sup> fines, and shallow water depths are the most limiting controllable factors. Poor habitat characteristics associated with natural low-flow conditions are the most limiting uncontrollable factors. Further upstream of the Larsen Co. outfall and extending beyond Smies Rd.,

the stream has been channelized. Banks are steep and scoured and provide little in-stream or riparian related habitat. Shallow water depths, low-flows, lack of coarse substrate, lack of pools and riffles and deposition of fines all ~~contribute to~~ limit fish and aquatic life habitat.

Downstream of the Larsen Co. discharge and extending downstream to Lake Michigan, in-stream habitat was rated "fair" overall. Within this 1.7 mile reach, the stream is characterized as a meandering channel with frequent riffle, pool and run complexes. Substrate is dominated by coarse gravel and rubble material. Banks are generally stable and covered by sufficient vegetative growth. Scouring of the lower banks is common while bank failure is limited to short reaches. Bottom deposition of fines is limited to point bars and lower banks. Despite the potential limiting factors associated with the natural low-flow characteristic of the stream, wastewater augmented flows combine with deep pools and runs to maintain suitable water depths for fish and other aquatic life.

Overall, in-stream habitat provided by Barr Creek is suitable to sustain a viable population of tolerant to very tolerant forage fish and lesser numbers of tolerant sport fish species. The aforementioned biological evaluations reinforce this conclusion.

#### Recreational Use

The combination of steep topography, undeveloped and heavily wooded floodplain provide for high natural beauty, particularly along the middle and lower reaches of it's watershed. Wetlands located near the mouth of the stream no doubt contribute aesthetic qualities to the area for residents located along the Lake Michigan coastline. The Department of Natural Resources maintains a Natural Scientific Area near the mouth of the stream.

While no attempts have been made to conduct a recreational use survey of Barr Creek, the size and depth of the stream would limit it's recreational uses to partial body contact forms such as fishing and wading.

#### Summary and Recommendations

A stream reclassification was completed for Barr Creek in order to assign effluent limits for maintaining appropriate water quality standards.

Barr Creek water quality is limited by cannery process wastewater and municipal wastewater discharges during low-flow periods. High carbonaceous and nitrogenous loadings

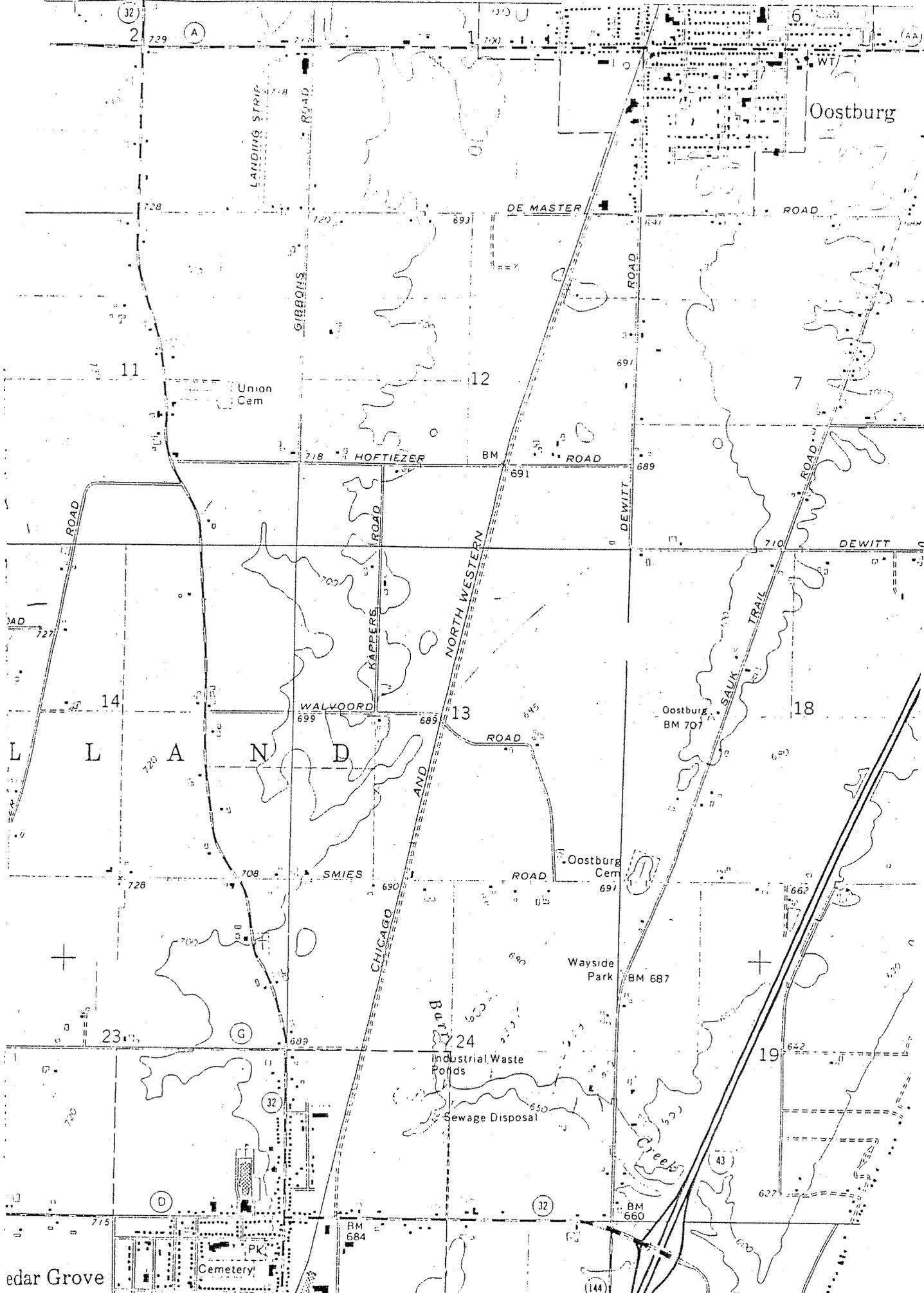
contribute to low dissolved oxygen concentrations. The combined wastewater discharges result in potentially acutely toxic concentrations of un-ionized ammonia.

Excessive nutrients discharged from agricultural nonpoint sources and wastewater discharges may contribute to nuisance growth of filamentous algae. Respiration of in-stream filamentous algae in combination with abundant phytoplankton discharged via the Larsen Co. wastewater ponds, also contribute to low dissolved oxygen concentrations during evening hours.

Barr Creek currently supports a population of fish dominated by tolerant to very tolerant forage species and lesser numbers of sport fish, primarily as black bullheads. Conversation with local residents and Larsen Co. employees indicate that anadromous runs of salmonids from Lake Michigan occur during the spring and fall season when flow conditions are suitable. Macroinvertebrate populations have never been ~~qualified~~. Field observations revealed a macroinvertebrate community dominated by very tolerant to tolerant forms. Poor water quality appears to be the most important factor limiting indigenous fish and aquatic life communities.

Stream system habitat was rated as being "poor" upstream of the Larsen Co. discharge and "fair" downstream of the same discharge. The most important uncontrollable factor limiting in-stream habitat is the natural low-flow conditions of the stream. However, suitable pool and run depths combine with augmented wastewater flows to provide suitable water supply and depths during extended low-flow periods.

After evaluating the various stream classification criteria, it is recommended that Barr Creek be reclassified from a marginal fish and aquatic life stream (Use Class E), to an intermediate fish and aquatic life stream (Use Class D). Water quality standards should be assigned so to protect this assigned biological use of Barr Creek. These supporting standards should be sufficient to protect seasonal anadromous salmonid populations which enter Barr Creek during high stream flow periods. In addition, it is recommended that the recreational use standards be applied which protect for partial forms of human contact.



Oostburg

LANDING STRIP

GIBBONS ROAD

DE MASTER ROAD

Union Cem

HOFTIEZER ROAD

ROAD

DEWITT ROAD

DEWITT ROAD

ROAD

KAPPERS ROAD

NORTH WESTERN

SAUK TRAIL

ROAD

WALVOORD ROAD

ROAD

L L A N D

Oostburg BM 707

Oostburg Cem

Wayside Park BM 687

Industrial Waste Ponds

Sewage Disposal

SMIES ROAD

ROAD

BM 660

BM 684

Cemetery

edar Grove

(32)

2

(A)

11

12

7

14

13

18

23

24

19

(D)

(32)

(32)

(43)

(144)

Appendix 2

Fish Sample Results from the 1986 Survey

Location: 300' reach from I-43 downstream (river mile 1.2).  
Gear: DC back pack shocker.

Species	Number	Comments
White sucker	56	Dominated by YOY. 3 up to 12" Adults with disdended abdomens
Creek chubs	22	Various year classes
Fathead minnows	2	
Common carp	1	
Central mudminnow	2	
Common shiner	1	

Location: 150' reach upstream of Smies Rd.  
Gear: DC back pack shocker.

Species	Number	Comments
Stickleback	2	
Fathead minnow	9	
White sucker	2	YOY 2 draintile observed discharging clear water

Stream BARA R. Reach Location APRIL 15, 1970 TO 1500 N. 1/4 SEC 15 T. 115 N. R. 15 E. S. 15 Reach Score/Rating \_\_\_\_\_  
 County SHE Date 5-5-70 Evaluator HEMUND Classification EN-P

ADJACENT

ADJACENT

5000000  
13

15

12

15

16

17

20

20

20

10

14

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion 14	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 12	No evidence of significant erosion. Little potential for future problem. 8	Some potential sources (roads, urban area, farm fields). 10	Moderate sources (small wetlands, tile fields, urban area, intense agricultural). 14	Obvious sources (major wetland drainage, high use urban or industrial area, feed lots, impoundment). 16
Bank Erosion, Failure 5000000 13	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 15	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 12	Ampis 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 15	Little or no encroachment 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. 15	Heavy deposits of fine material, increased bar development. 18
Bottom Scouring and Deposition 16	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 17	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 20	Cold >1' 0 Warm >1.5' 0	6" to 1' 0 10" to 1.5' 0	6 3" to 6" 18 6 6" to 10" 18	<3' 24 <6" 24
Avg. Depth of Pools 20	Cold >4' 0 Warm >5' 0	3' to 4' 0 4' to 5' 0	6 2' to 3' 18 6 3' to 4' 18	<2' 24 <3' 24
Flow, at Rep. Low Flow 20	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 6 2-5 cfs 6	6 .5-1 cfs 18 6 1-2 cfs 18	<.5 cfs 24 <1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles ÷ stream width) 10	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 14	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.

Stream Rocky Reach Location Rocky Falls to ... Reach Score/Rating 163  
 County Jefferson Date 5/21/70 Evaluator W. ... Classification INT-1

ALSO ...  
 ADJACENT ...  
 urban

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. 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. 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	6" to 1'	6	3" to 6"	18	<3"	24
	Warm >1.5'	0	10" to 1.5'	6	6" to 10"	18	<6"	24
Avg. Depth of Pools	Cold >4'	0	3' to 4'	6	2' to 3'	18	<2'	24
	Warm >5'	0	4' to 5'	6	3' to 4'	18	<3'	24
Flow, at Rep. Low Flow	Cold >2 cfs	0	1-2 cfs	6	.5-1 cfs	18	<.5 cfs	24
	Warm >5 cfs	0	2-5 cfs	6	1-2 cfs	18	<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 unpastured 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				

MIN 1.0  
 1.5 = 0.3

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.

Stream PAWY Reach Location 1/2 RTM to EAST Reach Score/Rating 178  
 County Stoughton Date 5/1/82 Evaluator W.A.H. Classification III

AC-RENT

Adjacent

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. 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 W = 7-11 D = 3	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. 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 8" 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

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

Don't want to be a better south-flow characteristic  
 Don't want to be a better NP5 - Poor Sources.

Stream PARA CR Reach Location CUTUP 3 - E --- TO CONCRETE Reach Score/Rating 172  
 County SUE Date 6/7/92 Evaluator MARKIN Classification III-B

Rating Item	Category			
	Excellent	Good	Fair	Poor
<i>AC-RENT</i> 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
<i>AD-TRENT</i> 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. 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. 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 6" to 1' 6 Warm >1.5' 0 10" to 1.5' 6	6 3" to 6" 18 6 6" to 10" 18	18 <3" 24 18 <6" 24	24 <3" 24 24 <6" 24
Avg. Depth of Pools	Cold >4' 0 3' to 4' 6 Warm >5' 0 4' to 5' 6	6 2' to 3' 18 6 3' to 4' 18	18 <2' 24 18 <3' 24	24 <2' 24 24 <3' 24
Flow, at Rep. Low Flow	Cold >2 cfs 0 1-2 cfs 6 Warm >5 cfs 0 2-5 cfs 6	6 .5-1 cfs 18 6 1-2 cfs 18	18 <.5 cfs 24 18 <1 cfs 24	24 <.5 cfs 24 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.

*Low flow characteristics most limiting within site. Further NPS & Point Source most limiting controllable factors.*

Stream FALLA Reach Location L. MICHIGAN LOCAL RIVER Reach Score/Rating 137  
ADJACENT TO SANDSPRING RES.  
 County Sevier Date 5/22/82 Evaluator J. HARRIS Classification INT-D

ADJACENT

ADJACENT

177  
Pool  
Pool

NOT APPLICABLE

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion 10	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 Sources 8	No evidence of significant sources. 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 5	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 6	90% plant density. Diverse trees, shrubs, grass. Plants healthy with apparently good root system. 8	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 8	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 18	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 16	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	30-60% 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 17	Greater than 30% 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 3	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 10	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 24	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: 10% Pool/Run	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 8	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.

Pool/Run like features framed by sand spit at outlet to L. Michigan.

Comments

SEWRPC 208 Planning (ie. recommendations for channel modifications, point source management recommendations, etc.)

Channel configuration (ie. meandering, straight, w/ or w/o thalwegs, braided, etc.)

*channelized upstream + abandoned main channel*

Dominant features (pools, riffles, runs complex)

*Wide - shallow runs*

Plunge pools

*none - large open hole at house cut fall*

Bank and stream shading

*5-10%*

Undercut banks

*NONE*

Springs

*none*

Stormsewer outfalls (locations and size)

*none*

Bank failure (scour or slumping)

*upstream of house 3 - severe in some places. severely eroded / shifting effluent channel from house 2*

In-stream vegetation (extent and species)

*Filamentous algae 30-75% - adjacent to abandoned portions*

Tributaries

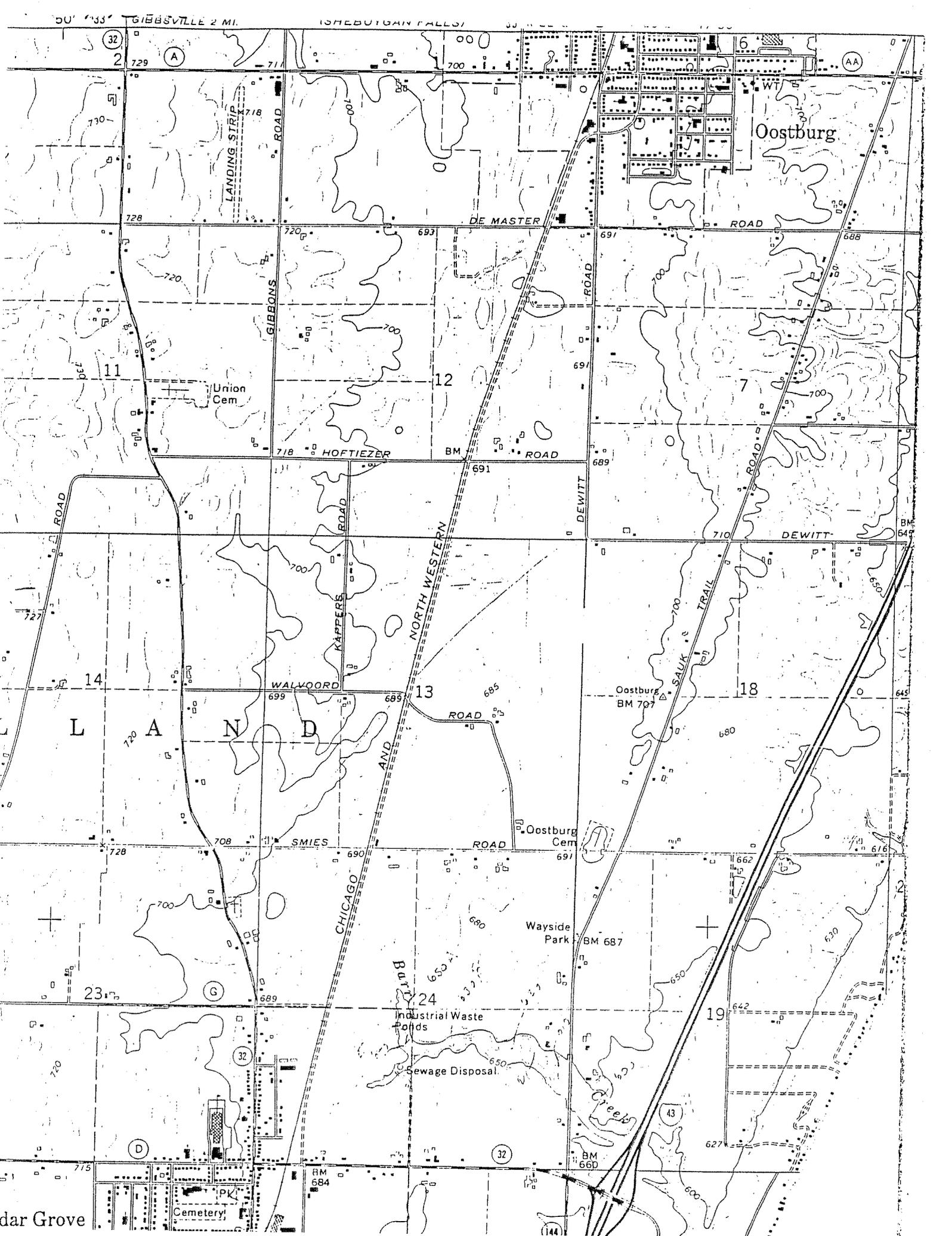
High water marks

*3'*

Exceptional habitat at low-flow

*eeper runs w/ snags*

Drain tiles



50' 33" GIBBSVILLE 2 MI.

ISHEBOGAN FALLS

32

A

AA

Oostburg

LANDING STRIP

DE MASTER ROAD

GIBBONS ROAD

12

Union Cem

HOFTIEZER ROAD

BM

ROAD

11

KAPPERS ROAD

NORTH WESTERN

DEWITT ROAD

ROAD

DEWITT

ROAD

14

WALWOOD ROAD

13

Oostburg BM 707

18

L A N D

CHICAGO AND

ROAD

SALK TRAIL

ROAD

23

SMIES ROAD

ROAD

Oostburg Cem

BM 687

Wayside Park

19

Butte

Industrial Waste Ponds

Sewage Disposal

ROAD

D

32

32

BM 660

Dar Grove

Cemetery

BM 684

144

Appendix 2

Fish Sample Results from the 1986 Survey

Location: 300' reach from I-43 downstream (river mile 1.2).  
Gear: DC back pack shocker.

Species	Number	Comments
White sucker	56	Dominated by YOY. 3 up to 12" Adults with disdended abdomens
Creek chubs	22	Various year classes
Fathead minnows	2	
Common carp	1	
Central mudminnow	2	
Common shiner	1	

Location: 150' reach upstream of Smies Rd.  
Gear: DC back pack shocker.

Species	Number	Comments
Stickleback	2	
Fathead minnow	9	
White sucker	2	YOY 2 draintile observed discharging clear water

1 30 82.9L .1B BARR CR 11 2 11 10/ 9/78 13N23E30SWNE60  
 0 2 50200

SP=04 HY=00 UNSP=00 FISH RAINBOW TROUT 1 BRASSY MINNOW 1 FATHEAD MINNOW 30 BLACK BULLHEAD 1

1 30 82.9L 1.2B BARR CR #BR- 2 23 5 6/17/76 13N23E19SWSW60  
 1 2 50200

SP=07 HY=00 UNSP=00 FISH CENTRAL MUDMINNOW 21 LAKE CHUB 9 BRASSY MINNOW 2 FATHEAD MINNOW 73  
 WHITE SUCKER 99 BLACK BULLHEAD 7 BROOK STICKLEBACK 30

1 30 93.8L .0 BLACK R 11 2 08 10/ 9/78 14N23E 2NESE60  
 1 2 50300

SP=15 HY=00 UNSP=00 FISH COHO SALMON 2 CHINOOK SALMON 1 RAINBOW TROUT 1 BROOK TROUT 1  
 NORTHERN PIKE 1 COMMON CARP 4 GOLDEN SHINER 24 BLUNTNOSE MINNOW 1  
 WHITE SUCKER 3 BROWN BULLHEAD 3  
 ROCK BASS 1 BLUEGILL 1 LARGEMOUTH BASS 4 BLACK CRAPPIE 5  
 YELLOW PERCH 2

1 30 93.8L 3.4 BLACK R T ? 01 5 8/ 8/24 14N23E14SWSW60  
 2 50300

SP=05 HY=00 UNSP=00 FISH CENTRAL MUDMINNOW 2 NORTHERN PIKE 1 BLUNTNOSE MINNOW 1 FATHEAD  
 MINNOW 21 BROOK STICKLEBACK 70

1 30 93.8L 3.4E BLACK R 11 2 03 10/ 9/78 14N23E23NWNW60  
 0 2 50300

SP=03 HY=00 UNSP=00 FISH CENTRAL MUDMINNOW 4 GOLDEN SHINER 1 BLACK BULLHEAD 4

1 30 93.8L 4.8B BLACK R #B- 5 23 5 6/16/76 14N23E22SWSE60  
 1 2 50300

SP=05 HY=00 UNSP=00 FISH CENTRAL MUDMINNOW 6 BRASSY MINNOW 1 GOLDEN SHINER 1 FATHEAD  
 MINNOW 1 WHITE SUCKER 1

1 30 93.8L 6.1 BLACK R #B- 6 23 5 6/16/76 14N23E33NENE60  
 2 50300

SP=03 HY=00 UNSP=00 FISH CENTRAL MUDMINNOW 50 WHITE SUCKER 2 BROOK STICKLEBACK 44

1 30 93.8L 7.5L 1.1 UN CR #B- 8 23 A 6/16/76 13N23E 5NESE60  
 2 50500

SP=01 HY=00 UNSP=00 FISH BROOK STICKLEBACK 12

1 30 93.8L 8.9E BLACK R 11 B 04 10/ 9/78 14N23E32SENW60  
 0 2 50300

SP=00 HY=00 UNSP=00 FISH  
 NO FISH CAPTURED +

STREAM AND SITE BACKGROUND

PERSONNEL: W. WANKZYA DATE: 10/5/94 TIME:    :   

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

STREAM INFORMATION

STREAM NAME: BARR CREEK WBIC: \_\_\_\_\_ STREAM LENGTH (mi.): \_\_\_\_\_

MAJOR BASIN CODE: 2 MINOR BASIN CODE: 30 SUBBASIN CODE: \_\_\_\_\_

TOWNSHIP: T     N RANGE: R     E SEC:     1/16:     1/4:     STREAM ORDER:      
(at confluence) (at confluence)

SITE INFORMATION

COUNTY CODE: 60 WATERSHED CODE: \_\_\_\_\_ SUBWATERSHED CODE: \_\_\_\_\_ SEGMENT NO.: \_\_\_\_\_

SITE NO.: 1

TOWNSHIP: T     N RANGE: R     E SEC:     1/16:     1/4:     STREAM ORDER:      
(at site) (at site)

LOCATION DESCRIPTION: UPSTREAM OF SAUK RD. BRIDGE.

SITE WATER QUALITY INFORMATION

TEMP. (C):     DISS. O2 (mg/l):     DISS. O2 (% sat):      
TURB. (htu):     pH (su):     COND. (umhos/cm):      
OTHER: \_\_\_\_\_

LIST HISTORICAL WATER RESOURCE REFERENCES:

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

(eg. previous basin plans, SEWRPC/DNR phys./chem. WQ data, HBI's, fisheries, stream classifications, water quality, Surface Water Resource publ. etc. incl. date of publ.)

- |                 |                    |               |
|-----------------|--------------------|---------------|
| Major basins:   | Minor basins:      | County codes: |
| L. Michigan = 2 | Milwaukee R. 20    | Kenosha 30    |
| Mississippi = 3 | Fox R. 210         | Milwaukee 41  |
|                 | Rock R. 221        | Ozaukee 46    |
|                 | Root/Pike R. 10    | Racine 52     |
|                 | Des Plaines R. 200 | Sheboygan 60  |
|                 | Sheboygan R. 30    | Walworth 65   |
|                 |                    | Washington 67 |
|                 |                    | Waukesha 68   |



Stream: Barr Creek <sup>→ upstream of saw RP</sup> Waterbody ID: \_\_\_\_\_ Station: \_\_\_\_\_ Site Mile: \_\_\_\_\_  
 Year: 94 Month: 10 Day: 5 Personnel: MAURYN  
 Total Score: 38 Qualitative Rating: FAIR

Rating Item	Excellent	Good	Fair	Poor	Score
Riparian Buffer Width (m), width of contiguous undisturbed land uses; meadow, shrubs, woodland, wetland, exposed rock	Riparian zone well protected; buffer wide (> 10.0 m) <u>15</u>	Riparian zone protected, but buffer width moderate (5.0-10.0 m wide) 10	Riparian zone moderately disturbed, buffer narrow (1.0-4.9 m) 5	Most of the riparian zone disturbed, buffer very narrow or absent (< 1.0 m wide) 0	
Bank Erosion, (width of bare soil on bank, along transects)	No significant bank erosion; < 0.20 m of bank is bare soil 15	Limited erosion; 0.20-0.50 m of bank is bare soil 10	Moderate erosion; 0.51-1.0 m of bank is bare soil 5	Extensive erosion; > 1.0 m of bank is bare soil <u>0</u>	
Pool Area, % of stream length in pools	Pools Common; wide, deep, slow velocity habitat, balanced by other habitats; 40 to 60% of station 10	Pools present; not frequent or over-abundant; 30 to 39% or 61 to 70% of station 7	Pools present, but either rare or overly dominant, few other habitats present; 10 to 29% or 71 to 90% of station <u>3</u>	Pools either absent or dominant, not balanced by other habitats; < 10% or > 90% of station 0	
Width:Depth Ratio, average stream width divided by average thalweg depth in runs and pools	Stream very deep and narrow; width/depth ≤ 7 15	Stream relatively deep and narrow; width/depth 8-15 <u>10</u>	Stream moderately deep and narrow; width/depth 16-25 5	Stream relatively wide and shallow; width/depth > 25 0	2.
Riffle:Riffle or Bend:Bend Ratio, average distance between riffles or bends divided by average stream width	Diverse habitats; meandering stream with deep bends and riffles common; ratio < 10 15	Diverse habitats; bends and riffles present, but not abundant; ratio 10 to 14 10	Habitat diversity low; occasional riffles or bends, ratio 15 to 25 <u>5</u>	Habitat monotonous; riffles or bends rare; generally continuous run habitat; ratio > 25 0	
Fine Sediments, % of the substrate that is < 2 mm (sand, silt, or clay)	Fines rare or absent, < 10% of the stream bed 15	Fines present but limited, generally in stream margins or pools; 10 to 20% of stream bed 10	Fines common in mid-channel areas, present in riffles and extensive in pools; 21 to 60% 5	Fines extensive in all habitats; > 60% of stream bed covered <u>0</u>	
Cover for Fish (% of the stream area with cover)	Cover/shelter for fish abundant; > 15% of stream 15	Cover common, but not extensive; 10 to 15% of stream 10	Occasional cover, limited to one or two areas; 5-9% of stream <u>5</u>	Cover rare or absent; limited to < 5% of stream 0	

Qualitative Ratings: Excellent ≥ 75; Good 50 to 74; Fair 25 to 49; Poor < 25

Total Score: 38

Revised June 1993

Figure 3.—Form used to characterize the quality of physical habitat in small (< 10 m wide) streams, based on the Fish Habitat Rating System. **Waterbody ID** - A unique seven-digit identification code assigned to each stream, river, and lake in Wisconsin. **Site Mile** - The distance in miles (via the stream channel) between the mouth of the stream and the downstream end of the site.

# WARMWATER IBI CALCULATIONS

(Scores for the species richness metrics are dependent on the zone where the stream is located and on stream size, and for the number of sunfish species metric in the central/southern zone, the distance from a lake or large river. Trophic and reproductive function metrics and fish abundance and condition correction factors use scoring criteria that are independent of stream size or location. Round all percentages to the nearest 1%. Possible metric scores are 0, 2, 5, 7, 10, except for the two "correction factor" metrics, which score either -10 or 0. The overall IBI score can range from 0 to 100.)

## Species Richness and Composition Metrics:

Total Number of Native Species: 5 SCORE: 0

Number of Darter Species: 0 SCORE: 0  
(Includes Sculpin and Madtom Species in Lake Superior Zone)

Number of Sucker Species: 1 SCORE: 5

Number of Sunfish Species: 0 SCORE: 0  
(Includes Yellow Perch in Lake Superior Zone)

Number of Intolerant Species: 0 SCORE: 0

Percent of All Individuals that are Tolerant Species: 71.5 SCORE: 0  
[(Tolerant Individuals: 103) / (Total Individuals: 144)] X 100

## Trophic and Reproductive Function Metrics:

Percent of All Individuals that are Omnivore Species: 59.03 SCORE: 0  
[(Omnivore Individuals: 85) / (Total Individuals: 144)] X 100

Percent of All Individuals that are Insectivore Species: 32.64 SCORE: 5  
[(Insectivore Individuals: 47) / (Total Individuals: 144)] X 100

Percent of All Individuals that are Top Carnivore Species: 0 SCORE: 0  
[(Top Carnivore Individuals: -) / (Total Individuals: -)] X 100

Percent of All Individuals that are Simple Lithophil Species: 53.47 SCORE: 10  
[(Simple Lithophil Individuals: 77) / (Total Individuals: 144)] X 100

## Fish Abundance and Condition Correction Factors:

Number of Non-Tolerant Individuals per 300 m Sampled: 144.7 SCORE: 0  
[(Total Individuals: 144) - (Tolerant Individuals: 103)] X [(300 m) / (Distance Sampled in m: 85)]

Percent of All Individuals that have Deformities, Eroded Fins, Lesions, or Tumors: 0 SCORE: 0  
[(DELT Individuals: -) / (Total Individuals: -)] X 100

OVERALL WARMWATER IBI SCORE: 20

OVERALL WARMWATER IBI RATING: Poor

WISCONSIN INDEX OF BIOTIC INTEGRITY (IBI) WORKSHEET

LOCATION AND SAMPLING INFORMATION:

Stream: Barr Creek Date: 10-5-94

Station: \_\_\_\_\_ Waterbody ID Code: \_\_\_\_\_ County: Sheboygan

Starting Location: upstream on Sawk Rd. Bridge

River Mile: \_\_\_\_\_ TWP: T13N RNG: R22E SEC: 24 1/16SEC: NE 1/4SEC: SE

Distance Sampled (m): 85 Sampling Gear: Back pack

Mean Width (m): 2.35 Log. Width (m): 0.854 Basin Area (mi<sup>2</sup>): \_\_\_\_\_ Order: \_\_\_\_\_

Warmwater IBI Zone (check one): South/Central:  North: \_\_\_\_\_ L. Superior: \_\_\_\_\_

Distance from Lake or Large River (check one): <5 miles (8 km):  >5 miles: \_\_\_\_\_

Temperature Potential (check one): Cold: \_\_\_\_\_ Warm:  Cool: \_\_\_\_\_ Uncertain: \_\_\_\_\_

FISH CAPTURED:

SPECIES	NUMBER	BIOMASS (g)	# DELT	COMMENTS
---------	--------	-------------	--------	----------

TOTALS: SPECIES: 5 NUMBERS: 144 BIOMASS (g): \_\_\_\_\_ DELT: \_\_\_\_\_

Stream BARR CR. Reach Location DNSTREAM OF I-43 TO CONSEQUENCY Reach Score/Rating 172  
 County SHE Date 6/18/86 Evaluator WANKLYN Classification INT-D

Rating Item	Category			
	Excellent	Good	Fair	Poor
<i>ADJACENT</i> 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
<i>ADJACENT</i> 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 failures. 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. 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. 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. 14	Stream does not enhance aesthetics. Condition of stream is offensive. 16

Column Totals:

Column Scores E \_\_\_\_\_ +G \_\_\_\_\_ +F \_\_\_\_\_ +P \_\_\_\_\_ = 171 = Score

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

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

*Low flow characteristics most limiting uncontrollable factor  
 NPS & point sources most limiting controllable factors.*

Comments

SEWRPC 208 Planning (ie. recommendations for channel modifications, point source management recommendations, etc.)

*NONE*

Channel configuration (ie. meandering, straight, w/ or w/o thalwegs, braided, etc.)

*MEANDERING w/ NEW BAR*

Dominant features (pools, riffles, runs complex)

*Complex*

Plunge pools

*NONE*

Bank and stream shading

*~ 50% OF LEACH*

Undercut banks

*RARE*

Springs

*SOME SEEPS, POSSIBLE BANK STORAGE FROM HIGH FLOW*

Stormsewer outfalls (locations and size)

*NONE*

Bank failure (scour or slumping)

*MINOR SLUMPING - LOWER BANK SCOUR IS COMMON*

In-stream vegetation (extent and species)

*~ 10 Filamentous algae - Heavy phytoplankton load from Hansen pond*

Tributaries

*2 - DRY RUN - SMALL - NON-CULVERT*

High water marks

*3!*

Exceptional habitat at low-flow

*POOLS & RUN BEDS w/ SNAGS.*

Drain tiles

Stream BACE Cr Reach Location L. MICHIGAN TIDAL "REACH" Reach Score/Rating 137  
ADJACENT TO CONSERVANCY AREA  
 County SUSSEX Date 6/18/86 Evaluator J. W. K. RYAN Classification INT-D

ADJACENT

ADJACENT

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion 10	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 8	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 4	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 6	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 8	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 18	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 16	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 17	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 0	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 10	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 24	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) 8	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 8	Wilderness characteristics, outstanding natural beauty. Usually wooded or unpastured 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

102% Run/Pool

NOT APPLICABLE

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.

Pool/Run like features framed by sand spit at outlet to L. MICHIGAN.

Comments

Large fish (species unknown) stirring throughout reach.

SEWRPC 208 Planning (ie. recommendations for channel modifications, point source management recommendations, etc.)

N/A

Channel configuration (ie. meandering, straight, w/ or w/o thalwegs, braided, etc.)

STRAIGHT pool/run-like features.

Dominant features (pools, riffles, runs complex)

Pool

Plunge pools

NONE

Bank and stream shading

25%

Undercut banks

tree roots undercut

Springs

NONE

Stormsewer outfalls (locations and size)

NONE

Bank failure (scour or slumping)

NONE

In-stream vegetation (extent and species)

Cattails Nuphar.

Tributaries

None

High water marks

1

Exceptional habitat at low-flow.

pools depth maintained

Drain tiles

Stream Bull Cr. Reach Location I-43 upstream to SAUL TRAIL Reach Score Rating 148  
 County Shoshone Date 5/21/86 Evaluator WALKER Classification INT-D

*ADJACENT*

*Adjacent*

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. 8	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 W=9-11' D=3'	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 yearly long. Pools almost absent due to deposition. 20
Bottom Substrate/Available Cover	Greater than 50% rubble, gravel or other stable habitat. <i>W/SCORDED CLAY</i> 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. 14	Stream does not enhance aesthetics. Condition of stream is offensive. 16

*riffle = .4  
runs = 1.0*

Column Totals:

Column Scores E \_\_\_\_\_ +G \_\_\_\_\_ +F \_\_\_\_\_ +P \_\_\_\_\_ = 148 = Score

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

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

*Down uncontrollable factor Low-flow characteristic  
Down controllable factor NPS + Point Sources.*

Comments

E0000 PASTURE DOWNSTREAM OF SAW TRAIL Rd. - Left bank.

SEWRPC 208 Planning (ie. recommendations for channel modifications, point source management recommendations, etc.)

N/A

Channel configuration (ie. meandering, straight, w/ or w/o thalwegs, braided, et

*Meandering*

Dominant features (pools, riffles, runs complex)

*Depth in pools + runs during low flow.  
P/R/R Complex*

Plunge pools

*None*

Bank and stream shading

*0-50%*

Undercut banks

*Present - suitable for small forage fish*

Springs

*Bank seeps - possible storage*

Stormsewer outfalls (locations and size)

*None*

Bank failure (scour or slumping)

*Scour present - slumping is severe in lower most segment of this reach - just upstream of I-475.*

In-stream vegetation (extent and species)

*< 10% filamentous algae - heavy phytoplankton from Larsen Co. discharge.*

Tributaries

*Intermittent - no discharge*

High water marks

*3'*

Exceptional habitat at low-flow

*Deep pools + runs - Abundant snags*

Drain tiles

Stream Rock Cr. Reach Location SAVE TRAIL Rd to Heaven's C. OUTFALL Reach Score/Rating 163  
 County SHEB Date 5/21/86 Evaluator [Signature] Classification INT-D.

Adjacent  
Adjacent  
Urban

Rating Item	Category			
	Excellent	Good	Fair	Poor
Watershed Erosion 10	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 10	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 16	No evidence of significant erosion or bank failures. 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 15	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 10	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. 18
Lower Bank Deposition 15	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. 15	Heavy deposits of fine material, increased bar development. 18
Bottom Scouring and Deposition 10	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	30-60% 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 5	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 12	Cold >1' 0 Warm >1.5' 0	6" to 1' 6 10" to 1.5' 0	3" to 6" 18 6" to 10" 18	<3" 24 <6" 24
Avg. Depth of Pools 18	Cold >4' 0 Warm >5' 0	3' to 4' 0 4' to 5' 0	2' to 3' 18 3' to 4' 18	<2' 24 <3' 24
Flow, at Rep. Low Flow 24	Cold >2 cfs 0 Warm >5 cfs 0	1-2 cfs 0 2-5 cfs 0	5-1 cfs 18 1-2 cfs 18	<.5 cfs 24 <1 cfs 24
Pool/Riffle, Run/Bend Ratio (distance between riffles + stream width) 8	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 10	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

NUNS = 1.0  
Riffle = 0.3

Column Totals:

Column Scores E \_\_\_\_\_ + G \_\_\_\_\_ + F \_\_\_\_\_ + P \_\_\_\_\_ = 163 = Score

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

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

SEWRPC 208 Planning (ie. recommendations for channel modifications, point source management recommendations, etc.)

Channel configuration (ie. meandering, straight, w/ or w/o thalwegs, braided,

*Meandering*

Dominant features (pools, riffles, runs complex)

*pool / riffle / run complex*

Plunge pools

*NONE*

Bank and stream shading

*25-80%*

Undercut banks

*present - suitable for small frog fish*

Springs

*2 of significance*

Stormsewer outfalls (locations and size)

*discharge urban runoff from unnamed tributary in Cedar Grove*

Bank failure (scour or slumping)

*MINOR - 1° SCOUR.*

In-stream vegetation (extent and species)

*Filamentous algae 10% or less*

Tributaries

*unnamed trib from Cedar Grove*

High water marks

*3'*

Exceptional habitat at low-flow

*Deep pools + runs.*

Drain tiles

Stream BARR CR Reach Location LAURENCE OUTFALL TO 1500' UPSTREAM OF SMILES RD Reach Score/Rating 223  
 County SHE Date 5/21/86 Evaluator WAWRZYN Classification INT-D

ADJACENT

ADJACENT

Rating Item	Category			
	Excellent	Good	Fair	Poor
14 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
14 Watershed Nonpoint Source	No evidence of significant 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
18 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
15 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
12 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
15 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. 15	Heavy deposits of fine material, increased bar development. 18
16 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
17 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
24 Avg. Depth Riffles and Runs	Cold >1' 0 Warm >1.5' 0	6" to 1' 0 10" to 1.5' 0	6 3" to 6" 18 6 6" to 10" 18	<3" 24 <6" 24
24 Avg. Depth of Pools	Cold >4' 0 Warm >5' 0	6 3' to 4' 0 6 4' to 5' 0	6 2' to 3' 18 6 3' to 4' 18	<2' 24 <3' 24
24 Flow, at Rep. Low Flow	Cold >2 cfs 0 Warm >5 cfs 0	6 1-2 cfs 0 6 2-5 cfs 0	6 .5-1 cfs 18 6 1-2 cfs 18	<.5 cfs 24 <1 cfs 24
16 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
14 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 \_\_\_\_\_ = 223 = Score

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

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

SEWRPC 208 Planning (ie. recommendations for channel modifications, point s management recommendations, etc.)

Channel configuration (ie. meandering, straight, w/ or w/o thalwegs, braided, e

*channelized upstream of abandoned Hansen Co. lagoons*

Dominant features (pools, riffles, runs complex)

*wide & shallow runs*

Plunge pools

*none - large scour hole at Hansen outfall*

Bank and stream shading

*50%*

Undercut banks

*NONE*

Springs

*none*

Stormsewer outfalls (locations and size)

*none*

Bank failure (scour or slumping)

*upstream of Hansen Co - severe in some bends. Severely eroded/failing effluent channel from Hansen Co.*

In-stream vegetation (extent and species)

*Filamentous algae 30-75% - adjacent to abandoned lagoons*

Tributaries

High water marks

*3'*

Exceptional habitat at low-flow

*Deeper runs w/ snags*

Drain tiles

DATE: Sept 11, 1977

STREAM: Barr Creek

DISCHARGER: Cedar Grove STP

COUNTY Sheboygan

CLASSIFICATION RECOMMENDATION

It is recommended that this stream be classified as non-continuous, marginal fish and aquatic life.

ADDITIONAL COMMENTS

At time of survey, Cedar Grove STP pumping out anaerobic materials from old Imhof tank to Barr Creek. Larsen Canning Co apparently not discharging during survey.

ATTACHMENTS

USGS map

REFERENCES USED

CC: Mark Tusler (Central Office)  
Frank Schultz (SED)

WISCONSIN DEPARTMENT OF NATURAL RESOURCES  
 STREAM CLASSIFICATION WORKSHEET

Receiving Watercourse : Barr Creek  
 District : Southeast  
 Location : SE 1/4, SW 1/4, Sec 24, T13N, R23E,  
 Sheboygan Co  
 Major Basin : Lake Michigan  
 Discharger : Cedar Grove STP  
 Flow (Design & Actual) : Design - 0.22 MGD  
 Type of Treatment : tertiary - sand filter w/  
 aerated lagoons

Recommended No.	Reach	Classification Location
	1	Above Cedar Grove STP outfall
	2	Sauk Trail Road
	3	Marine Road

Date of Field Observations : Sept. 11, 1979

Personnel : Joe Kurz Class : ES-4

Other Persons Contacted : Cedar Grove STP operator (name unknown)

Noted by WQES :

Date :

PHYSICAL FEATURE		STREAM CLASS REACHES				
		1	2	3	4	5
Watershed Character (maps or observations)	Size (sqmi)					
	Vegetation Type					
	Predominant Land Use	Agricultural	Agricultural	Scientific Area		
	Wetland Type					
Hydrologic Features (indicate if estimated or actual measurements)	Width (ave)	~ 4'	~ 6'	~ 15'		
	Depth (ave/max)	Ave - 3"	Ave - 6"	-		
	Velocity (est)(fps)	~ 1.5fps	~ 0.5fps	-		
	Flow (cfs)	~ 1 cfs	~ 1.5 cfs	very slow		
	Pools or Refuges for Fish No. observed, depth					
% Bottom Type	Silt		10%			
	Sand	20%	50%			
	Gravel	80%	20%			
	Rubble		10%			
Other		Detritus 10%				
Control Structures or Obstructions		None	None	None		
Irretriv. Channel Alterations		None	None	None		
Discharge Q <sub>710</sub>		Verbal - Plant operator 0				



BIOLOGICAL CHARACTERISTICS

STATIONS ON RECEIVING WATER

	1	2	3	4	5
Bank Vegetation	trees, grasses	trees, shrubbery, Forbs & grasses	wetland vegetation		
Aquatic Macrophytes	None	None	None		
Invertebrates	Asellus very abt. no other inverts observed	Asellus very abt. along with other tolerant invertebrates	—		
Phytoplankton (algae)	some filamentous algae	Heavy filamentous algae growth	Not observed		
Fish Observed	None observed	None observed	None observed		
Fishery Classification	Limited fishery potential. May have Lake Michigan migrants during parts of the year.				

BIOLOGICAL CHARACTERISTICS  
(continued)

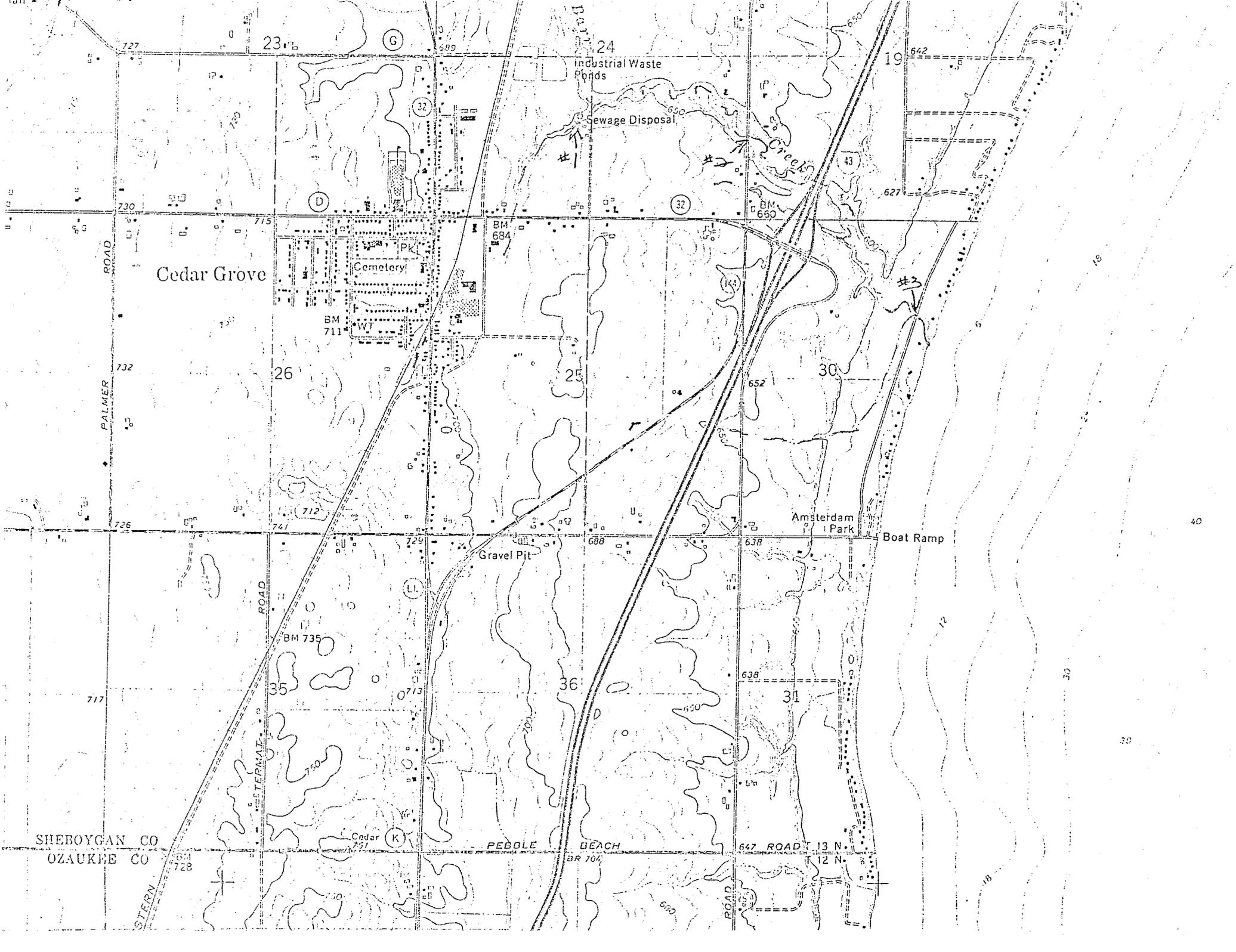
STATIONS ON RECEIVING WATER

		1	2	3	4	5
Reaches of Critical or Particular Wildlife Value eg: 	Spawning Areas	None	None	None		
	Critical Habitats					

CULTURAL FEATURES

STATIONS ON RECEIVING WATER

		1	2	3	4	5
Recreational Uses		None	None	Limited fishery		
Type of Drainage Sources Observed		Agricultural	Agricultural marsh			
Other Discharges		Larsen Canning Co.	None	None		



Cedar Grove

Industrial Waste Ponds

Sewage Disposal

Cemetery

Amsterdam Park

Boat Ramp

Gravel Pit

PEBBLE BEACH

SHEBOYGAN CO  
OZAUKEE CO

23

24

19

26

25

30

35

36

31

727

730

732

726

717

728

689

BM 684

BM 711

BM 735

688

638

638

650

700

760

700

650

650

627

652

622

72

30

18

40

20

18

Cedar Grove

Sheboygan County

Survey Date: 8-26-75

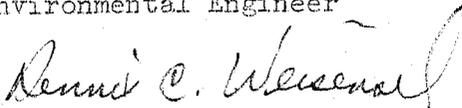
Cedar Grove STP discharges its effluent to a small tributary to Barr Creek which empties into Lake Michigan. The source of the tributary flow is cooling water. Barr Creek receives the discharge from the Larsen Company lagoons when they are lowered in the Spring. Barr Creek and the tributary exhibited gravel, sand, and rock beds. Pools and riffles were present.

Recommendations

Non-continuous, agricultural.

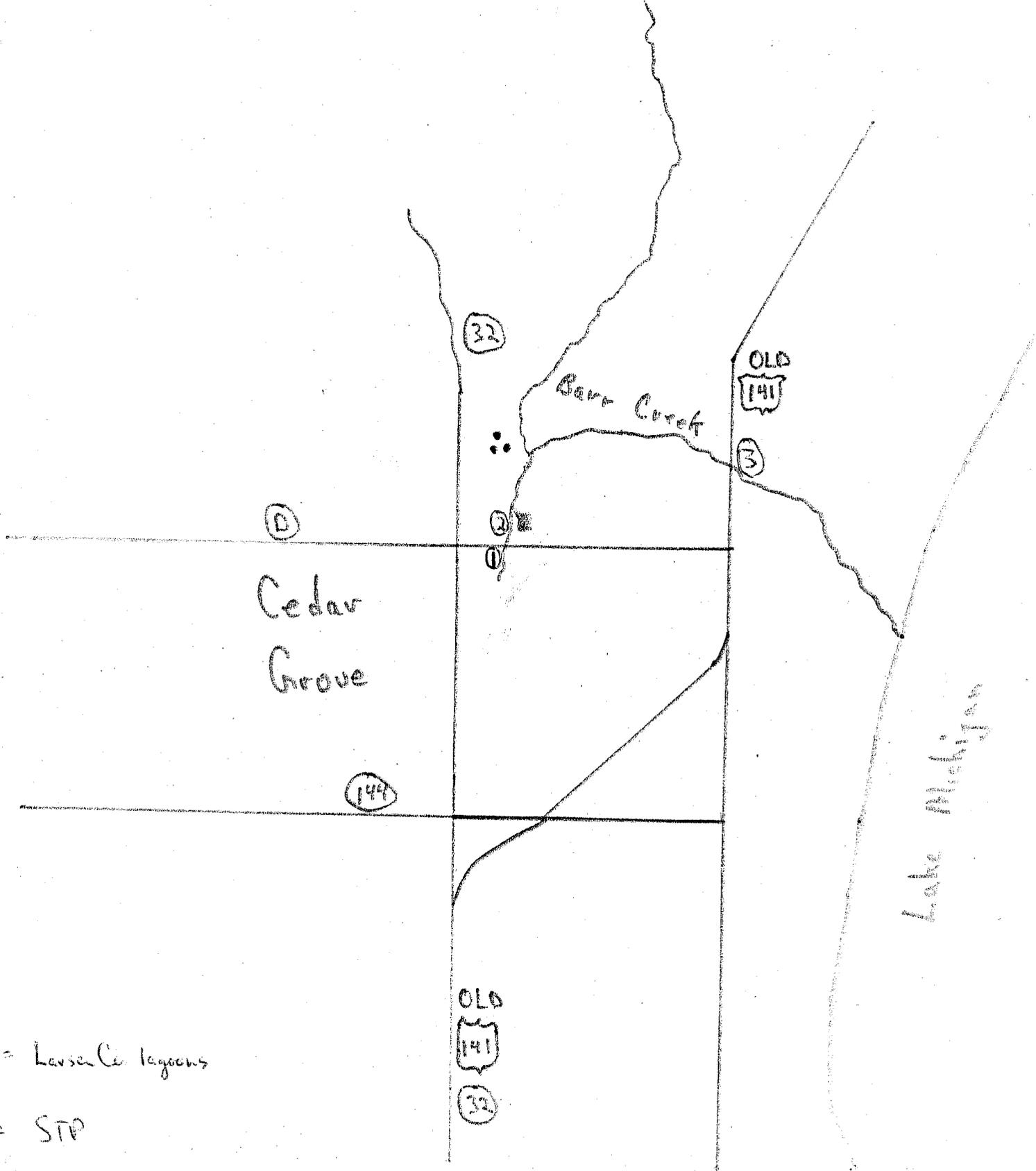


Robert B. Lucas  
Environmental Engineer



Dennis C. Weisensel  
District Biologist

RBL:dcw:sh



•• = Larsen Cell lagoons

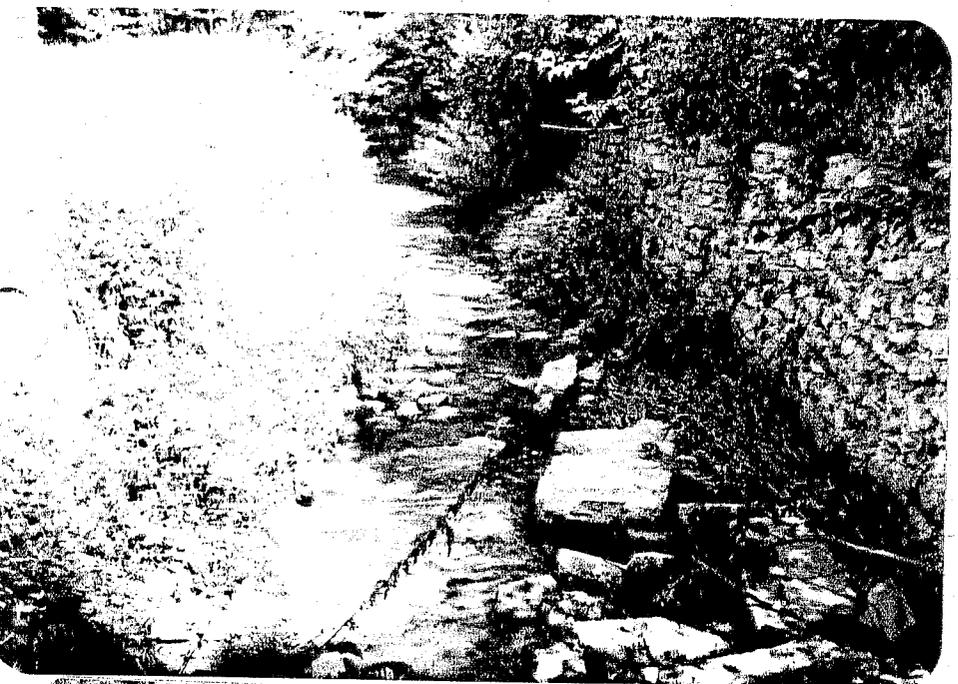
□ = STP

# Cedar Grove



# 1 Tributary to Bear Cr.

Looking upstream - stream was  
clear - Non-Contact cooling  
water



# 2 At STP

Looking downstream  
Outfall coming in from left



# 3 Sault Trail Rd

Looking downstream