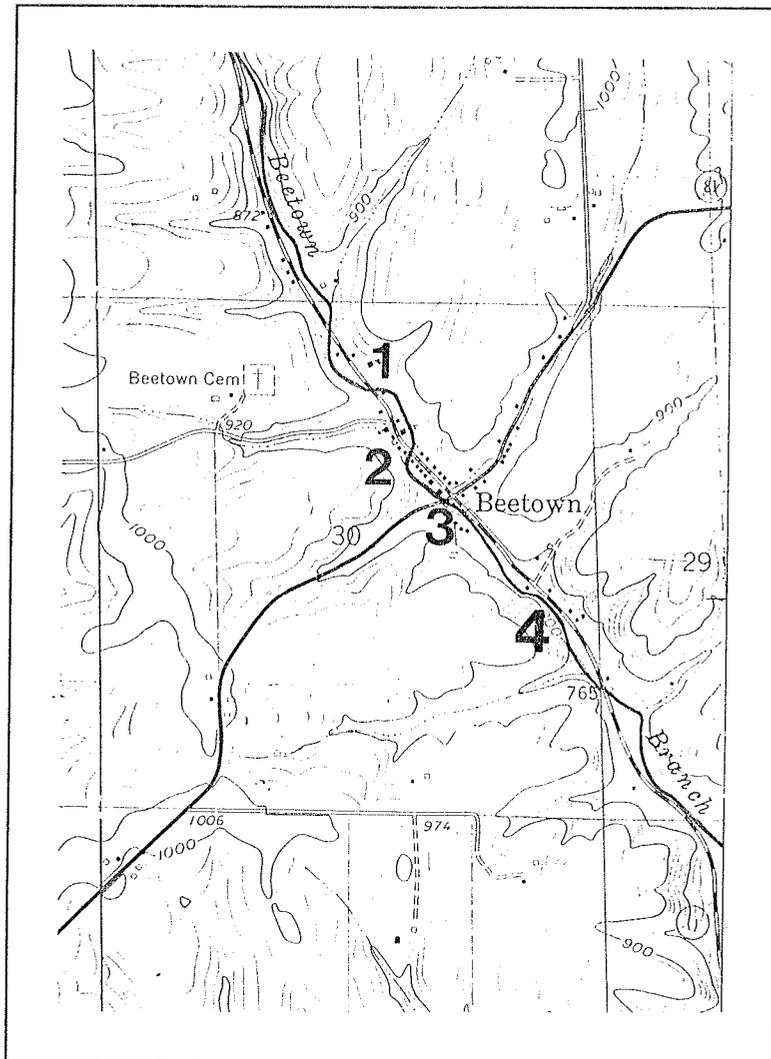


STREAM CLASSIFICATION and WATER QUALITY ASSESSMENT of
BEETOWN BRANCH, T 4 N - R 4 W, GRANT COUNTY, WISCONSIN

September, 1994

Beetown Branch Sampling Sites



by

Dave Marshall Water Resources Mgt. Biologist
and
Jack Saltes Wastewater Engineer

WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Beetown Branch - Resource Description

Beetown Branch is a high gradient (71 ft./mi.) spring-fed stream originating one mile north of the Beetown community. The stream drains 4.28 square miles and flows southeast for 3.4 miles to the confluence with the Grant River. The stream has several access points since it meanders a short distance on either side of CTH U for most of its length. Beetown Branch supports an abundant forage fish community and an occasional smallmouth bass can be found near the mouth of the stream.

Beetown Community File

Beetown is an unincorporated rural community with a population of 115. The community is unsewered and has several private septic systems and holding tanks which may be affecting Beetown Branch and the local groundwater supplies. Since the soils are unsuitable for private sewer systems, the Southwestern Regional Planning Commission (1975) recommended that a public sewer system should be considered. Almost twenty years later, no action has been taken on this recommendation. The Grant County Sewer and Water Plan suggested that converting to public systems will enhance growth in the community, but potential environmental and economic impacts of local population growth have not been assessed.

Since 1978, Grant County has issued 13 private sewer system permits, 11 for holding tanks and two for septic systems. Several residences along the stream are still served by old substandard systems. In 1991, an illegal discharge was detected below a restaurant/bar. The Grant County Sanitation Department ordered the failing septic system to be plugged and converted to a holding tank.

Water Quality Investigation

On April 19, 1994, DNR and Grant County staff conducted a stream survey from Site 4 to Site 1 (see map) and collected water samples at the four sites. At the time of the survey, several wastewater discharges and seeps were observed entering the stream even sewage systems were not heavily used at the time. Although flow rates from the systems were low, filamentous bacteria growths indicated pollution below the discharge sites. In addition to wastewater contamination, petroleum seepage under the STH 81 bridge indicated substantial soil contamination, most likely from a leaking underground storage tank.

DNR staff collected additional water samples from Sites 1 and 4 on May 5, 1994. Beetown Branch water quality data for both sampling dates are presented in Table 1. For the most part, the samples indicated measurable, but not indicate significant, water pollution. During peak wastewater systems use, increased discharge may cause more significant water pollution of Beetown Branch.

Table 1: Beetown Branch Water Quality Data
April - May, 1994

Parameter	Site 1	Site 2	Site 3	Site 4
D. O. (mg/l)	11.2			13.1
Temp. (C)	10.2			11.5
pH (s. u.)	8.1			8.4
Hardness (mg/l)	380			400
Chloride (mg/l)	24.9	23.9	21.9	30.8
Conduc.umho/cm	732			757
Alk. (mg/l)	327			345
Tot. P (mg/l)	.08			.06
TKN (mg/l)	0.3			<.2
NH ₃ (mg/l)	.014	.012	.012	.02
NO ₂ +NO ₃ (mg/l)	6.51			5.07
BOD ₅ (mg/l)	<3	<3	<3	<3
COD (mg/l)	ND			ND
sus. solids (mg/l)	12			12
MFFCC/100ml	70 - 860	80	60	100
Fecal Strep/100ml	80 - 250	<10	20	80
Flow (cfs)				1.73 - 1.74

Rapid Biological Assessment of Beetown Branch

DNR staff conducted a *rapid bio-assessment* of Beetown Branch on April 15, 1994. Macroinvertebrates were sampled and identified in the field to determine the Family-level Biotic Index (Hilsenhoff, 1988) at Sites 1 and 4. Fish were sampled at Site 4 with a pulse D. C. battery backpack stream shocker.

The Family Biotic Index (FBI) indicated "good water quality" in the stream and values were 4.65 at both sites. These results are consistent with a previous macroinvertebrate survey (1984) when the Biotic Index indicated "good water quality" (HBI = 5.29). Consistent with the Fish Distribution Survey results (1978), Beetown Branch currently supports a forage fish community with species representing good water quality. Five species were collected during the recent survey compared to eight species in 1978. In general, abundance of riffles and pools provide good habitat for forage fish. The stream substrate is predominately rock of various sizes. Silt is not a significant problem due to flushing from the high gradient channel.

Stream Classification

Beetown Branch supports macroinvertebrate and forage fish communities intolerant of significant pollution. Stream habitat and water quality support diverse well-balanced aquatic communities indicative of a **Warm Water Forage Fish (WWFF)** stream.

Water Quality Investigation participants: Jack Saltes, DNR Wastewater Engineer, Rick DeWitte, DNR Conservation Warden, and Wilbur Austin, Grant County Sanitarian.

Rapid Bio-assessment participants: Dave Marshall and Mike Sorge, DNR Water Resources Mgt. Biologists .

Table 2: Beetown Branch Fisheries Data

April 15, 1994
Station 4, Length = 165'

Common Name	Genus / species	Number	W. Q. Tolerance
Stonerollers	Camostoma sp.	5	Intolerant
Blacknose dace	Rhinichthys atratulus	15	Intolerant
Brook stickleback	Culaea inconstans	2	Tolerant
Johnny darter	Etheostoma nigrum	1	Tolerant
Fantail darter	Etheostoma flabellare	20	Intolerant

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May 24, 1978
Station 4

Common Name	Genus / species	Number	W. Q. Tolerance
Stonerollers	Campostoma sp.	79	Intolerant
Central stoneroller	C. anomalum	6	Intolerant
Common shiner	Notropis cornutus	1	Tolerant
S. redbelly dace	Phoxinus erythrogaster	16	Intolerant
Fathead minnow	Pimephales promelas	1	Very tolerant
Blacknose dace	Rhinichthys atratulus	97	Intolerant
Longnose dace	R. cataractae	7	Intolerant
Creek chub	Semotilus atromaculat.	18	Tolerant
White sucker	Catostomus commers.	6	Tolerant

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Sample ID # 940415-22-01 Waterbody Name Beetown Branch
Y Y M M D D Cnty Field #

Temp (Celsius) 8.7 Dissolved Oxygen (mg/l) 9.5

Sample Location: 30 4N 4W Master Waterbody # _____
1/16 1/4 Sec. Tn. Rng.

Project Name Stream Class Storet Station # _____

Ave. Stream Width (Ft.) at Site 5 Ave. Stream Depth (Ft.) at Site 0.5

Collector MARSHALL D (Last Name, First Initial) Field # _____ Rep 1 Rep 2 Rep 3
Measured Velocity (fps) _____

Sorter _____ Est. Velocity (fps) V. Slow (<-0.2)
Est. % of Sample Sorted _____ Slow (0.2-0.5)
Taxonomist _____ Moderate (0.5-1.5)
Fast (1.5- >)

Location Description CTH U Above Hwy 81 Sampled Habitat: 1/Riffle 2. Run
42° 47' 52N 3. Pool 4. Lake
90° 53' 19W

Sampling Device: 1 D Frame, 2. Artificial Substrate, 3. Surber, Est. Time Spent Sampling (Min.) 2
4. Other _____

Substrate at Site Location (%)
5 Bedrock 25 Rubble (2.5-10.0" dia.) 10 Sand _____ Clay _____ Muck _____
25 Boulders (10.0" dia.) 25 Gravel (0.1-2.5" dia.) _____ Silt _____ Detritus _____ Debris/Veg. _____

Substrate Sampled (%) (Same as above 100)
Bedrock _____ Rubble (2.5-10.0" dia.) _____ Sand _____ Clay _____ Muck _____
Boulders (10.0" dia.) _____ Gravel (0.1-2.5" dia.) _____ Silt _____ Detritus _____ Debris/Veg. _____

Aquatic Vegetation 5 % of Total Stream Channel at Sample Site

Observed Instream Water Quality Indicators (Perceived WQ: Excellent, Good, Fair, Poor)

	Not Present	Insignificant	Significant	Comments
Turbidity	1	2	3	
Chlorine or Toxic Scour	1	2	3	
Macrophytes	1	2	3	
Filamentous Algae	1	2	3	
Planktonic Algae	1	2	3	
Slimes	1	2	3	
Iron Bacteria	1	2	3	

Factors Which May Be Affecting Habitat Quality

	Not Present	Insignificant	Significant	Comments
Sludge Deposits	1	2	3	
Silt and Sediment	1	2	3	
Channel Ditching	1	2	3	
Down/Up Stream Impoundment	1	2	3	
Low Flows	1	2	3	
Wetlands	1	2	3	

Pollutant Sources

	Not Present	Insignificant	Significant	Comments
Livestock Pasturing	1	2	3	
Barnyard Runoff	1	2	3	
Cropland Runoff	1	2	3	
Tile Drains	1	2	3	
Septic Systems	1	2	3	
Streambank Erosion	1	2	3	
Urban Runoff	1	2	3	
Construction Runoff	1	2	3	
Point Source (Specify Type)	1	2	3	
Nonpoint Source (Specify)	1	2	3	

Stream Name:

Beetown Br.

Field Number:

01

Date:

4-15-94

Value X Number =

Plecoptera Capniidae	1		
Chloroperlidae	1		
Leuctridae	0		
Nemouridae	2		
Perlidae	1		
Perlodidae	2		
Pteronarcyidae	0		
Taeniopterygidae	2		

Ephemeroptera Baetidae	4	28	112
Bactiscidae	3		
Caenidae	7		
Emphemerellidae	1		
Ephemeridae	4		
Leptophlebiidae	4		
Heptageniidae	2	6	12
Metretopodidae	2		
Oligoneuridae	2		
Polymitarcyidae	2		
Potomanthidae	4		
Siphonuridae	7		
Tricorythidae	4		

Odonata Aeshnidae	3		
Calopterygidae	5		
Coenagrionidae	9		
Cordulegastridae	3		
Corduliidae	5		
Gomphidae	1		
Lestidae	9		
Libellulidae	9		
Macromiidae	3		

Tricoptera Brachycentridae	1	12	12
Glossosomatidae	0		
Helicopsychidae	3		
Hydropsychidae	4	10	40
Hydroptilidae	4		
Lepidostomatidae	1		
Leptoceridae	4		
Limnephilidae	4		
Molannidae	6		
Odontoceridae	0		
Philopotamidae	3	1	3
Phryganeidae	4		
Polycentropodidae	6		

Value X Number =

Tricoptera Psychomyiidae	2		
Phyacophilidae	0		
Sericostomatidae	3		

Megaloptera Corydalidae	0		
Sialidae	4		

Lepidoptera Pyralidae	5		
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Coleoptera Dryopidae	5		
Elmidae	4		
Psephenidae	4		

Diptera Athericidae	2		
Blephariceridae	0		
Ceratopogonidae	6		
Chironomidae (Blood red)	8		
Chironomidae (Other)	6		
Dolichopodidae	4		
Empididae	6		
Ephydriidae	6		
Psychodidae	10		
Simuliidae	6	1	
Muscidae	6		
Syrphidae	10		
Tabanidae	6		
Tipulidae	3	2	6

Amphipoda Gammaridae	4	8	32
Talitridae	8		

Isopoda Asellidae	8	28	224
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Totals		96	447
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FBI = 4.65

"Good w.g."

Sample ID # 940415-22-04 Waterbody Name Beetown Branch
 Y Y M M D D Cnty Field #

W Temp (Celsius) 8.5 Dissolved Oxygen (mg/l) 10.2

Sample Location: 30 4N 4W Master Waterbody # _____
 1/16 1/4 Sec. Tn. Rng.

Project Name Stream class Storet Station # _____

Ave. Stream Width (Ft.) at Site 7.5 Ave. Stream Depth (Ft.) at Site 0.4

Collector MARSHALL D (Last Name, First Initial) Field # _____ Rep 1 Rep 2 Rep 3
 Measured Velocity (fps) 3.8 - 1.62

Sorter _____ Est. Velocity (fps) V. Slow (<0.2)
 Est. % of Sample Sorted _____ Slow (0.2-0.5)
 Taxonomist _____ (Moderate) (0.5-1.5)
 Fast (1.5- >)

Location Description CTH U below Hwy 81 Sampled Habitat: Riffle 2. Run
42° 47' 27N 3. Pool 4. Lake
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 _____ Boulders (10.0" dia.) _____ Gravel (0.1-2.5" dia.) _____ Silt _____ Detritus _____ Debris/Veg.

Substrate Sampled (%) (Same as above _____)
 _____ Bedrock _____ Rubble (2.5-10.0" dia.) _____ Sand _____ Clay _____ Muck
 _____ Boulders (10.0" dia.) _____ Gravel (0.1-2.5" dia.) _____ Silt _____ Detritus _____ Debris/Veg.

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Filamentous Algae	1	2	3	
Planktonic Algae	1	2	3	
Slimes	1	2	3	
Iron Bacteria	1	2	3	

Factors Which May Be Affecting Habitat Quality

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Sludge Deposits	1	2	3	
Silt and Sediment	1	2	3	
Channel Ditching	1	2	3	
Down/Up Stream Impoundment	1	2	3	
Low Flows	1	2	3	
Wetlands	1	2	3	

Pollutant Sources

	Not Present	Insignificant	Significant	Comments
Livestock Pasturing	1	2	3	
Barnyard Runoff	1	2	3	
Cropland Runoff	1	2	3	
Tile Drains	1	2	3	
Septic Systems	1	2	3	
Streambank Erosion	1	2	3	
Urban Runoff	1	2	3	
Construction Runoff	1	2	3	
Pollutant Source (Specify Type)	1	2	3	
Other (Specify)	1	2	3	

Stream Name:

Beetown Branch

Field Number: _____

Date: _____

Value X Number =

Plecoptera Capniidae	1		
Chloroperlidae	1		
Leuctridae	0		
Nemouridae	2		
Perlidae	1	2	2
Perlodidae	2		
Pteronarcyidae	0		
Taeniopterygidae	2		

Ephemeroptera Baetidae	4	56	224
Bactiscidae	3		
Caenidae	7		
Emphemerellidae	1		
Ephemeridae	4		
Leptophlebiidae	4		
Heptageniidae	2		
Metretopodidae	2		
Oligoneuridae	2		
Polymitarcyidae	2		
Potomanthidae	4		
Siphonuridae	7		
Tricorythidae	4		

Odonata Aeshnidae	3		
Calopterygidae	5		
Coenagrionidae	9		
Cordulegastridae	3		
Corduliidae	5		
Gomphidae	1		
Lestidae	9		
Libellulidae	9		
Macromiidae	3		

Tricoptera Brachycentridae	1	1	1
Glossosomatidae	0		
Helicopsychidae	3		
Hydropsychidae	4	2	8
Hydroptilidae	4		
Lepidostomatidae	1		
Leptoceridae	4		
Limnephilidae	4		
Molannidae	6		
Odontoceridae	0		
Philopotamidae	3		
Phryganeidae	4		
Polycentropodidae	6		

Value X Number =

Tricoptera Psychomyiidae	2		
Phyacophilidae	0		
Sericostomatidae	3		
Megaloptera Corydalidae	0		
Sialidae	4		
Lepidoptera Pyralidae	5		

Coleoptera Dryopidae	5		
Elmidae	4		
Psephenidae	4		

Diptera Athericidae	2		
Blephariceridae	0		
Ceratopogonidae	6		
Chironomidae (Blood red)	8		
Chironomidae (Other)	6	21	126
Dolichopodidae	4		
Empididae	6	1	6
Ephydriidae	6		
Psychodidae	10		
Simuliidae	6		
Muscidae	6		
Syrphidae	10		
Tabanidae	6		
Tipulidae	3		

Amphipoda Gammaridae	4	18	72
Talitridae	8		

Isopoda Asellidae	8	9	72
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Totals 110 511

FBI = 4.65