Reviewed by CBub Date 3/2004

Region SCR **County** Jefferson **Report Date** 6/1998 **Classification** LFF

Water Body: Deer Creek

Discharger: Helenville

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 habitat

_____ 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.)

✓ Physical Data (flow, depth, etc.)

✓ Habitat Description

✓ Site Description/Map

Other:

Historical Reports in file:

6/11/98 - Dave Marshall
2/1996 - Dave Marshall

Additional Comments/How to improve report:

- 96 report states that habitat degredation was most limiting factor in stream
- 96 reports recommends WW classn (?) — 98 report recommends LFF
- Check w/ region to find out (1) - If the discharger sited plant on this stream segment and (2) what the appropriate classn should be

STREAM CLASSIFICATION OF DEER CREEK AND UNNAMED TOWN OF JEFFERSON-HELENVILLE TRIBUTARIES
(File update and summary)

Prepared by
Dave Marshall, WDNR SCR
June 11, 1998

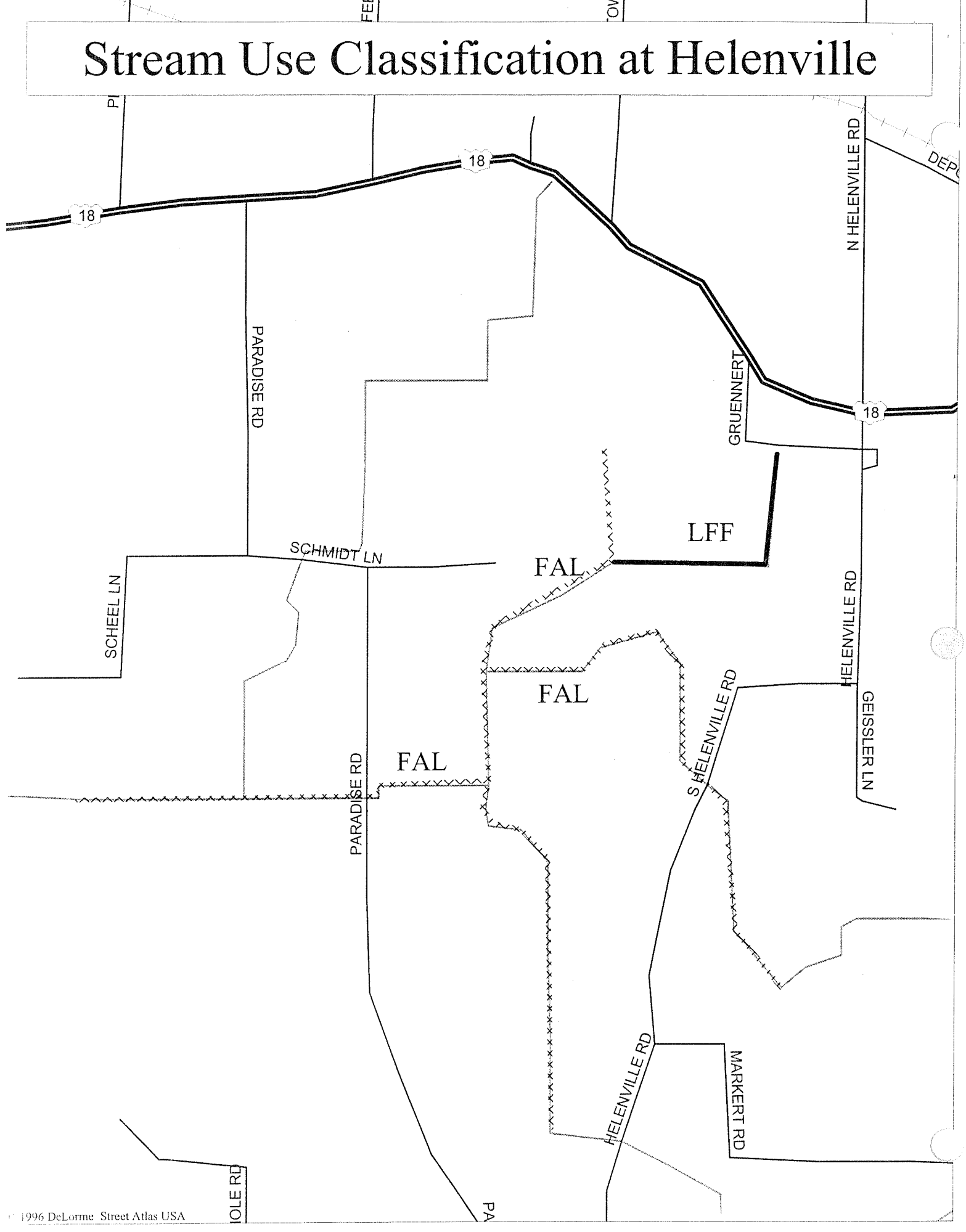
In February, 1996, a formal stream classification request was submitted to the Department of Natural Resources to classify the ditched headwaters or tributary to Deer Creek. Beginning in April, I made several visits to the area to collect use classification data as different discharge scenarios were presented to the Department. The entire area was historically composed of extensive wetlands, many of which have been drained by a complex network of ditches. Most of these ditches have continuous flow and support diverse forage fish populations connected to Deer Creek main stem and Rock River.

In November of 1996, a small ditched section south of Helenville could not be sampled due to frozen conditions. Based on the low flow characteristics of this stream section, I predicted that a Limited Forage Fish (LFF) community may best reflect the stream use classification but the determination could not be official until the stream could be sampled. On December 13, a meeting was held at GEF II involving Helenville community representatives, their consultant and various Region and Central Office DNR staff. At that time, I understood the consultant was going to provide the Department additional data to needed to verify the predicted use classification, even though DNR staff advised that a LFF variance classification would not likely change the effluent limits due to the short distance between the proposed discharge site and FAL section and low reaeration potential in the low gradient stream.

Due to more recent concerns expressed by Wisconsin Community Action Program Association staff and others that verification of the small stream use classification was necessary for the community to weigh various discharge options, DNR SCR staff sampled the stream on May 20, 1998. The stream was sampled while other field work was conducted in the vicinity.

At that time, a pulse DC battery powered backpack shocker was used to sample approximately 150' of stream. Sampling was extremely difficult due to shallow water overlaying soft sediment deposits up to 3 feet deep. We collected 10 central mudminnows, 1 brook stickleback, green frog adults and tadpoles, and crayfish. Numerous other mudminnows and stickleback were not counted as they escaped capture by swimming into the dense canary reed grass. Based on the sampling results, the Limited Forage Fish (LFF) use classification has been verified for this small section of stream (see attached map and support documents).

Stream Use Classification at Helenville



M.B. | M.B. | M.B. MILE | FIRST ORDER MILE

SECOND | THIRD | FOURTH | FIFTH

SIXTH | SEVENTH | EIGHTH | NINTH

TENTH | ELEVENTH | STATION MILE: 0016.

LOCATION
Unnamed Ditch trib. to Deer Creek

JAR | WTC | TOWN: 6N | RANGE: 15E | SEC.: 03 | 1/16 | 1/4: SE | CO.: 28

WIDTH
L 1.5
M 2
U 3

DEPTH
L .2
M .5
U 1.0

VELOCITY

WATER TEMP.
°F

CONDUCTIVITY *umhos*

TURBIDITY

pH

BOTTOM TYPE %

CONCRETE	A	
BEDROCK	B	
HARDPAN	C	
BOULDER	D	
RUBBLE	E	
GRAVEL	F	
SAND	G	
SILT & MUCK	H	100
CLAY	I	
MARL	J	
DETRITUS	K	
RUBBISH	L	
PEAT	M	

AQUATIC VEG.
EMERGENT 3
SUBMERGENT 2
BUCKWEED
ALGAE (ATT) 1
ALGAE (FF)

STREAM BANK VEGETATION %

CULTIVATED	A	
FALLOW	B	
UPLAND PASTURE	C	
UPLAND MEADOW	D	
UPLAND HARDWOOD	E	
UPLAND CONIFER	F	
UPLAND SHRUB	G	
LOWLAND PASTURE	H	50
LOWLAND HARDWOOD	I	
LOWLAND CONIFER	J	
LOWLAND SHRUB	K	
OPEN MARSH	L	
CUT GRASSES	M	
BEACH	N	
LOWLAND MEADOW	O	50
OPEN WATER	P	

Department of Natural Resources
Form 8100-46 Rev. 11-93

S.D. | 3 GEAR | EFFORT | Distance UP 150

WBIC | 05 20 1998 MO. DAY YEAR | DOWN

WUTM X 43°00.440. Y 88°42.347.

SPECIES	NO.	
K01	10	central mudminnow
U01	1	brook stickleback
		numerous green frogs & tadpoles
		numerous crayfish

CORRESPONDENCE/MEMORANDUM — **State of Wisconsin**

DATE: November 15, 1996

TO: Bonnie Goodweiler WR/2

FROM: Dave Marshall Dave M.

SUBJECT: Stream classification update on Deer Creek tributaries. Attach to original Deer Creek stream classification.

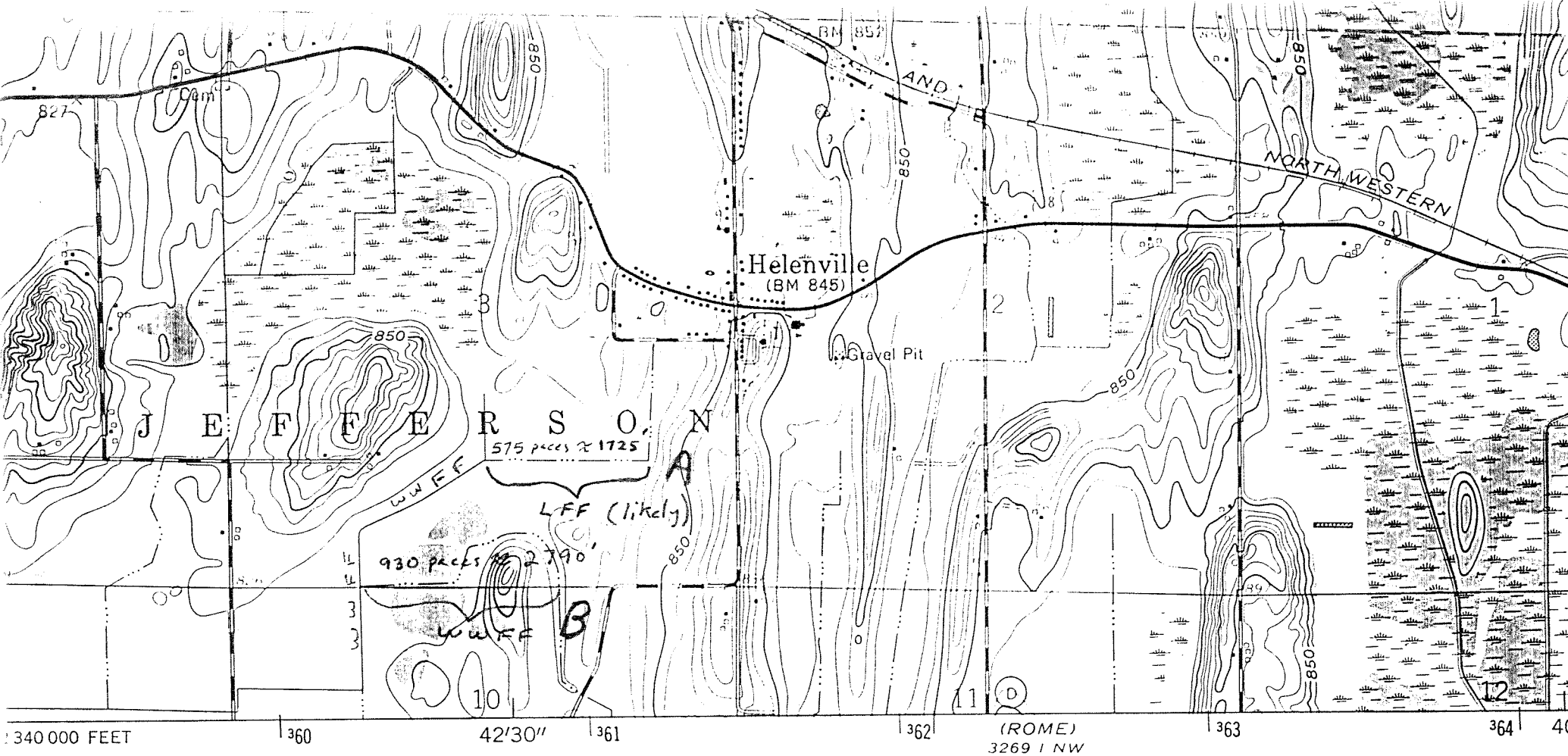
Due to concerns expressed by a few WDNR WMT staff and Strand Associates representing the Helenville Sanitary District, that the April stream classification for Deer Creek and the Helenville Branch may be inaccurate, I revisited the area on November 8th and 15th.

While the Helenville Branch sustains considerable flow (estimated 10 cfs) at the southwest $^1/_4$ Section 3, several lateral ditches converge above that point.

North and east flowing ditch B (see map) was sampled on November 8. At the farm road off Helenville Road, the stream flow was measured at 0.9 cfs, using a Swoffer Model 2100 meter. I sampled both fish and invertebrates with a d-frame bug net. Abundant *Gammarus pseudolimneus* were collected with each sweep of the net. *Gammarus* is a good indicator that groundwater sustains continuous flow in the ditch. Numerous fish, consisting of five species, were also collected along with an immature green frog: Brassy minnow (abundant), Southern redbelly dace (abundant), Common shiner (common), Brook stickleback (common) and Fathead minnow (common). Other species may be present since fish collection with a d-frame net is not effective. Based on both abiotic and biotic factors, the ~ .5 mile ditch from the farm road to the confluence with the Helenville Branch is warm water forage fish (WWFF).

I attempted to sample ditch A (see map) on November 13, but it was frozen at time. I walked from the point where the ditch makes a right (west) turn to the point where it connects with the Helenville Branch. The confluence with Helenville Branch is also where continuous flow is indicated on the USGS Quad map. Based on apparent low flow characteristics of ditch A, a limited forage fish (LFF) classification may best reflect both current and potential stream uses. However, a proposed variance classification for that stream reach needs to be verified by sampling the fish and benthic invertebrate communities during an open water period.

cc George Osipoff
Ken Johnson SCR
Greg Kester MWT/2
Russ Pope MWT/2



340 000 FEET 360 42'30" 361 362 (ROME) 3269 I NW 363 364

al Survey

nethods

outh zone

aphs

SCALE 1:24 000

1 0 1 MI

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

DATUM IS MEAN SEA LEVEL

MN

GN

1°09'
20 MILS

1½°
27 MILS

UTM GRID AND 1971 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

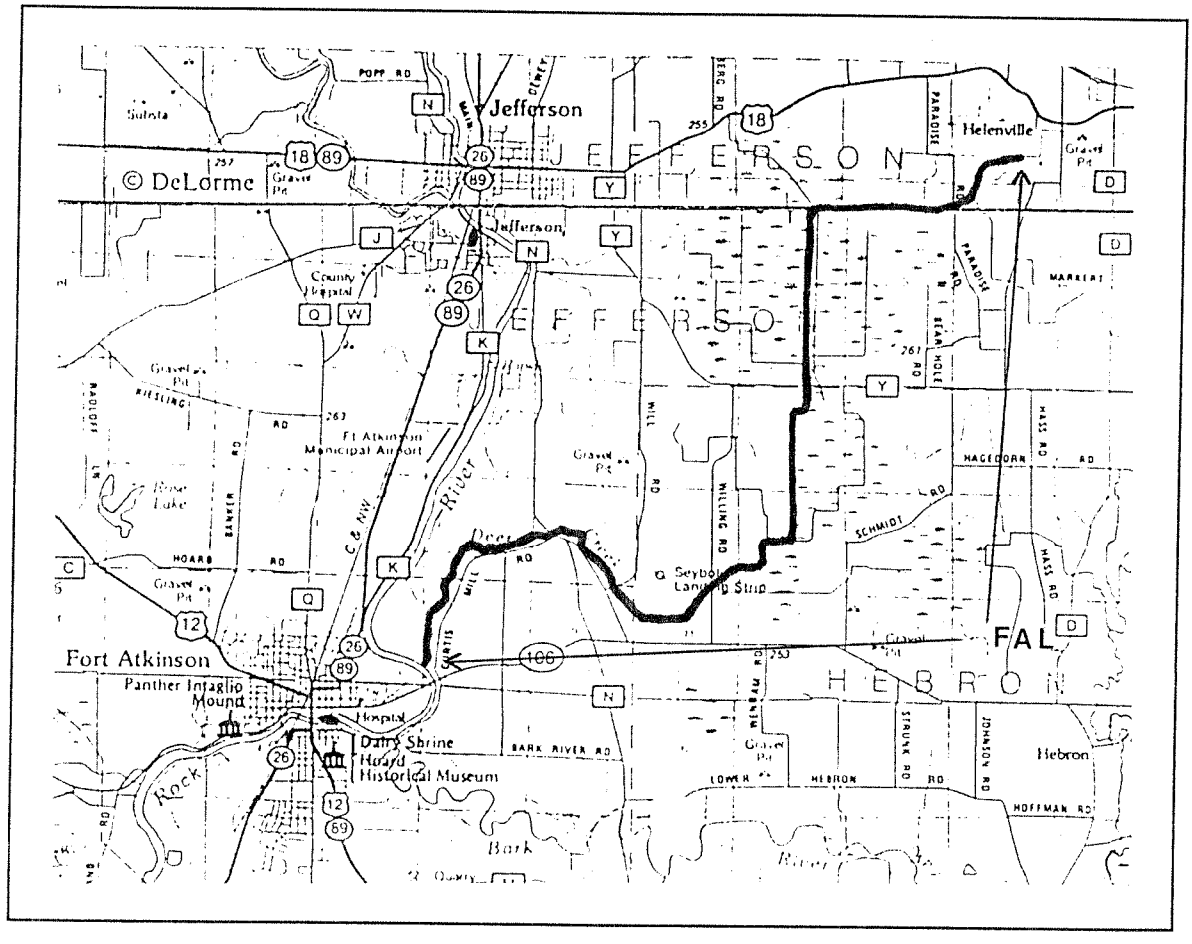
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS

FOR SALE BY U. S. GEOLOGICAL SURVEY, WASHINGTON, D. C. 20242

AND BY THE WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY, MADISON, WISCONSIN 537

A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

CLASSIFICATION of DEER CREEK
and
UNNAMED TRIBUTARY ("HELENVILLE BRANCH")



Prepared by David Marshall

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
SOUTHERN DISTRICT HEADQUARTERS

DEER CREEK AND TRIBUTARY (*Helenville Br*): RESOURCE DESCRIPTION

During the 1950s, over 4,624 acres of undrained wetlands comprised the headwaters of Deer Creek. Prior to the late 1960s, an intricate system of agricultural ditches were constructed to drain the extensive wetland complex encompassing Sections 7, 8, 9, 16, 17, 18, 20, 21, 29 and parts of others in the Town of Hebron (T. 6 N. - R. 15 E.). One of the ditches begins in Section 3 in Helenville. The "Helenville Branch" flows west and south for approximately 6 miles before it officially becomes Deer Creek. The "Helenville Branch" and other ditches comprise over 20 miles of direct drainage to the creek. In addition to the tributaries, Deer Creek had been ditched for another 2.6 miles before it reaches Highway N. Below "N", the stream exhibits more natural morphology including frequent meanders. Riffles are occasionally found, however the overall stream gradient is quite low (3.4 ft/mi.). The natural channel extends for approximately 3 miles before the confluence with the Rock River.

The *Surface Water Resources of Jefferson County* (1968) report describe Deer Creek as supporting a forage fishery. In 1975, WDNR Bureau of Research sampled the stream in Sections 30 and 35 as part of the Fish Distribution Study. A total of 16 species of fish were found. The fish survey occurred 3 years after silage juice leaked into the stream at Will Road. The discharge destroyed intolerant benthic macroinvertebrates and stimulated extensive growths of *Sphaerotilus natans* ("sewage fungus") over the stream substrate.

1988 BASIN ASSESSMENT RESULTS

The lower reaches of Deer Creek were sampled in November, 1988, as part of the Upper Rock River Basin Assessment. Fish were sampled at Will Road and CTH "N". Green and pumpkinseed sunfish were the only species that were not found in 1975. Macroinvertebrates collected at CTH "N" indicated "good" water quality with a Hilsenhoff Biotic Index (HBI) value of 5.04.

1996 SURVEY RESULTS

In April, 1996, WDNR staff electrofished the "Helenville Branch" a short distance below Paradise Road. A 12 volt battery powered AbP-3 pulse DC shocker was used to sample eighty feet of stream before the unit malfunctioned. Even though the unit was not functioning properly and only a short distance was sampled, 6 species were found representing 4 families. The average stream width and depth were approximately 7' and 3' respectively. The ditch was nearly uniform for a considerable distance in either direction but the volume was sufficient to support numerous fish. Flow was estimated at 10 cfs. Dissolved oxygen (d. o.) and temperature were measured with a YSI Model 58 meter. At Paradise Road, d. o. and temperature were 8.4 mg/l and 9.5° C.

Downstream at CTH "Y", a double-gated water control structure lies just upstream of the bridge. During the survey, only one of the gates were open. Water passing through the open gate was at such a high velocity that it was impossible to stand and maintain balance 50 feet downstream, in water less than 1 foot deep. Such a high velocity will prevent fish migrations beyond the structure.

At Paradise Road, a long time resident commented how the stream no longer supports a major northern pike spawning run. Operation of the dam can be a major factor preventing historic northern pike runs from reaching the Deer Creek headwaters. Even though agricultural drainage has severely reduced total wetland area and functions, sufficient northern pike spawning habitat can be found within flooded lateral drainage courses.

Using a Swoffer Model 2100, stream flow was 31.7 cfs approximately 200 feet below the CTH "Y" bridge. Dissolved oxygen and temperature were measured at 6.4 mg/l and 7.8° C respectively. Although the reach could not be shocked, abundant forage fish were observed swimming within the fast current. Macroinvertebrates were collected with a d-frame to complete a "rapid field bioassessment". The Family Biotic Index (FBI) indicated "fairly poor" water quality or value of 5.96.

Subjectively, water quality appeared to be fair and habitat degradation was the most limiting factor in the stream. Turbidity was not significant but the water was stained somewhat.

CLASSIFICATION DETERMINATION

From the headwaters in Helenville downstream to the confluence with the Rock River, the "Helenville Branch" and Deer Creek support *Warm Water Fish and Aquatic Life Communities.*

REFERENCES

Ball, Joe. 1982. Stream Classification Guidelines for Wisconsin. Madison, WI.

Fago, Don. 1982. Distribution and Relative Abundance of Fishes in Wisconsin. WDNR Tech. Bull. No. 136.

Hilsenhoff, W. L. 1988. Rapid Field Assessment of Organic Pollution with a Family-Level Biotic Index. J. N. Am. Benthol. Soc. 7(1): 65-68

Hilsenhoff, W. L. 1987. An Improved Biotic Index of Organic Stream Pollution. The Great Lakes Entomol. Vol. 20, No. 1.

Poff, Ronald J., R. Peining, and C. W. Threinen. 1968. Surface Water Resources of Jefferson County. Madison, WI.

Table 1: "Helenville Branch" Fish Species (April, 1996)

Family	Common Name	Scientific Name
Umbridae	central mudminnow	*Umbra limi*
Cyprinidae	fathead minnow	*Pimephales promelas*
	hornyhead chub	*Nocomis biguttatus*
	southern redbelly dace	*Phoxinus erythrogaster*
Ictaluridae	black bullhead	*Ictalurus melas*
Gasterosteidae	brook stickleback	*Culaea inconstans*

Deer Creek (1975 and 1988)

Umbridae	central mudminnow	*Umbra limi*
Esocidae	northern pike	*Esox lucius*
Cyprinidae	common carp	*Cyprinus carpio*
	hornyhead chub	*Nocomis biguttatus*
	common shiner	*Notropis cornutus*
	bigmouth shiner	*Notropis dorsalis*
	spotfin shiner	*Notropis spilopterus*
	bluntnose minnow	*Pimephales notatus*
Catostomidae	white sucker	*Catostomus commersoni*
Ictaluridae	black bullhead	*Ictalurus melas*
	yellow bullhead	*I. natalis*
	brown bullhead	*I. nebulosus*
Cyprinidontidae	blackstripe topminnow	*Fundulus notatus*
Gasterosteidae	brook stickleback	*Culaea inconstans*
Centrarchidae	green sunfish	*Lepomis cyanellus*
	pumpkinseed sunfish	*L. gibbosus*
Percidae	johnny darter	*Etheostoma nigrum*
	walleye	*Stizostedion vitreum*

STREAM DISCHARGE DATA

Stream: Deer Cr & Hellenville Br Location: CTH Y Date: 4-19-96

County: Jefferson Sampling Gear: Swoffer D. O.: 6.4 mg/l

Temp.: 7.8 C Project: Stream Classification

Dist. from bank (ft.)	Depth (ft.)	0.2 depth vel. (fps)	0.8 depth vel. (fps)	0.6 depth / ave. fps	Flow (cfs)
2	1.1			0.98	2.16
4	1.35			1.58	4.26
6	1.3			1.97	5.12
8	1.7			2.0	6.8
10	1.8			1.7	6.12
12	1.7			1.22	4.15
14	1.65			0.71	2.34
16	1.0			0.37	0.74
Tot. width					Tot. cfs
16'	1.45 ave.			1.32 ave.	31.7

Comments: Abundant forage fish and crayfish observed within fast current below the dam.

MACROINVERTEBRATE FIELD AND BENCH SHEET
Form 3200-81 Rev. 4-90

Department of Natural Resources

Sample ID # 960419-28-01 (YY MM DD Cnty Field #) Waterbody Name DEER (Helenville Br.)

Water Temp (Celsius) 7.8 Dissolved Oxygen (mg/1) 6.4

Sample Location: 1/16 1/4 Sec. 20 Tn. 6N Rng. 15E Master Waterbody #

Project Name Storet Station #

Ave. Stream With (Ft.) at Site 16 Ave. Stream Depth (Ft.) at Site 1.5

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

Sorter

Est. % of Sample Sorted

Taxonomist

Location Description 200' below CTH Y

Est. Velocity (fps): V. Slow (<-0.2), Slow (0.2-0.5), Moderate (0.5-1.5), (Fast) (1.5-.>)

Sampled Habitat: 1. Riffle (2. Run) 3. Pool 4. Lake

Est. Time Spent Sampling (Min.) 4

Sampling Device: (1. D Frame,) 2. Artificial Substrate, 3. Surber, 4. Other

Substrate at Site Location (%)

Bedrock	Rubble (2.5-10.0" dia.)	Sand	40	Clay	35	Muck	
Boulders (10.0" dia.)	10	Gravel (0.1-2.5" dia.)	Silt		Detritus	15	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/V			

Aquatic Vegetation % 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	
	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	
	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	
Other (Specify)	1	2	3	

SOUTHERN DISTRICT District Biotic Index Report

HBI _ 5.040 Rep1 _ Rep2 _ Rep3 _____

Sample ID # _881111-28-04 Waterbody Name _DEER CR.

Water Temp (Celsius) _5.4 ___ Dissolved Oxygen (mg/l) _9.7 _

Sample Location: S25 T 6N R14E_ Master Waterbody # _

Project Name _NPS BASIN ASSESSMENT Storet Station # _

Ave. Stream Width (Ft.) at Site _ Ave. Stream Depth (Ft.) at Site _

Collector _MARSHALL, D. Field # 04 Rep 1_

Measured Velocity (fps) _

Sorter _GEHRING, T. Est. Velocity (fps)

Est % of sample sorted _10 _Fast (1.5- >)

Taxonomist _DIMICK, J. Sampled Habitat

Location Description _CTH N _1. Riffle

_____

_____

Est. Time Spent Sampling (Min.) _ 0__

Sampling Device _1. D Frame _____

Substrate at Site Location (%)

.0 Bedrock	20.0 Rubble	10.0 Sand	0.0 Clay	0.0 Muck	
.0 Boulders	50.0 Gravel	10.0 Silt	0.0 Detritus	10.0 Debris/Veg	

Substrate Sampled (%) (Same as above No_)

0.0 Bedrock	0.0 Rubble	0.0 Sand	0.0 Clay	0.0 Muck
0.0 Boulders	0.0 Gravel	0.0 Silt	0.0 Detritus	0.0 Debris/Veg

Aquatic Vegetation 0 % of Total Stream Channel at Sampling Site

Observed Instream Water Quality Indicators (Perceived WQ _____)

	Not Present	Insig- nificant	Sig- nificant	Comments
Turbidity				FINGERNAIL CLAMS NUMEROUS
Chlorine or Toxic Scour				
Nauisophyte				
Filamentous Algae				
Planktonic Algae				
Slimes				
Iron Bacteria				

Factors Which May Be Affecting Habitat Quality

Sludge Deposits			
Silt and Sediment			
Channel Ditching		3	
Dam/Up Stream Impoundment		3	UPSTREAM IMPOUNDMENT
Low Flows			
Wetlands			

Pollutant Sources

Livestock Pasturing			
Barnyard Runoff		3	
Cropland Runoff		3	
Tile Drains	2		
Septic Systems			
Streambank Erosion	2		
Road Runoff			
Construction Runoff			
Point Source(Specify Type)			
Other (Specify)			

SAMPLE ID# 881111-28-04

*** TAXA ***	SPECIES	TAXONOMIC KEY USED	TOL VAL	ORGANISM ID	ORGANISM COUNT REP1	REP2	REP3
PLECOPTERA							
TAENIOPTERYGIDAE							
TAENIOPTERYX		*1	2.00	01080300	0	0	0
TRICHOPTERA							
HYDROPSYCHIDAE							
CHEUMATOPSYCHE		*1	5.00	04040100	18	0	0
HYDROPSYCHE	BETTENI	*2	6.00	04040201	23	0	0
CERATOPSYCHE	BRONTA	*2	5.00	04040703	3	0	0
POOR SPECIMEN		*1		04041000	1	0	0
COLEOPTERA							
ELMIDAE							
DUBIRAPHIA		*1	6.00	07020200	2	0	0
OPTIOSERVUS		*1	4.00	07020500	19	0	0
STENELMIS		*1	5.00	07020600	51	0	0
DIPTERA							
CHIRONOMIDAE							
ORTHOCLADIUS	SP.D	*3	5.00	08054004	3	0	0
EMPIDIDAE							
HEMERODROMIA		*4	6.00	08070200	2	0	0
SIMULIIDAE							
SIMULIUM	VITTATUM	*5	7.00	08110217	1	0	0
TIPULIDAE							
DICRANOTA		*1	3.00	08140200	1	0	0
TIPULA		*1	4.00	08141200	2	0	0
AMPHIPODA							
GAMMARIDAE							
GAMMARUS	PSEUDOLIMNAEUS	*6	4.00	09010201	1	0	0

*** TOTALS: *** 127 0 0

*** BIOTIC INDEX: *** 5.040

Taxanomic Key Code References

*1	Hilsenhoff 1981
*2	Hilsenhoff 1981,86
*3	Hilsenhoff 1981,85
*4	Merritt,Cummins 84
*5	Hilsenhoff 1985
*6	Holsinger 1972