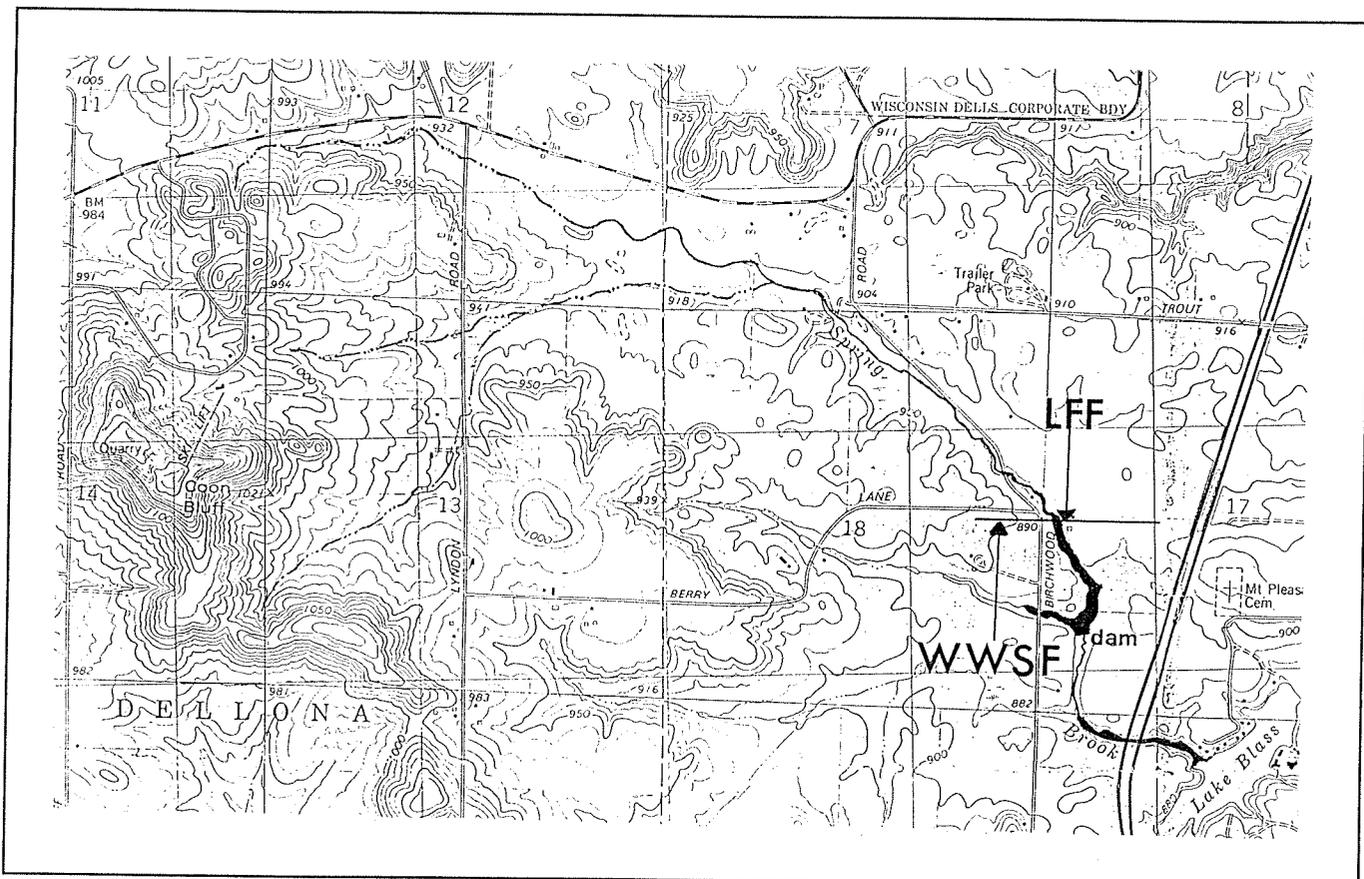


USE CLASSIFICATION OF SPRING BROOK, SAUK COUNTY

June, 1995



Spring Brook Use Classification Zones

Prepared by

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Christmas Mountain

Resource Description

Spring Brook is a small stream formed below several intermittent tributaries in the Dell Creek Watershed. Primary landuses in the watershed include agriculture, wetlands and woodlands. The main channel sustains continuous flow during wet periods but becomes intermittent during dry years. The stream was described as intermittent in "Surface Water Resources of Sauk County" (1971) and Southern District Water Resources Management staff also observed no flow above the SW $\frac{1}{4}$, Section 17, T.13N.-R.6E. during a stream survey in 1990.

Both Spring Brook and Dell Creek have been impounded to create small recreational lakes. Spring Brook empties into Lake Delton, a 267 acre lake formed by a 20 foot dam on Dell Creek. Approximately 1 mile upstream of Lake Delton, a 16 foot dam was constructed on Spring Brook in 1929 to form 34 acre Blass Lake. Consistent with most impoundments in Southern Wisconsin, both lakes have displayed poor water quality over the years. The last impoundment (7 acres) was created in 1990 at Spring Brook Campground, less than $\frac{1}{2}$ mile above Blass Lake. Staff recommended that another dam should not be constructed due to long history of poor water quality in the other local impoundments and based on models predicting hyper-eutrophic conditions within the 7 acre impoundment.

Use Classification Survey

Spring Brook was sampled a short distance above the Spring Brook Campground impoundment. This is the farthest downstream reach which still displays natural stream characteristics before the impoundments restrict flow.

Flow was measured at 0.2 cubic feet per second using a Swiffer Model 2100 digital read-out flow meter. The water contained adequate dissolved oxygen, a YSI Model 57 digital meter measured 7.3 mg/l and temperature of 18.6 °C. The substrate was nearly 100% sand with no sludge deposits or dense macrophytes beds which could affect oxygen levels. The water was mostly clear but displayed a moderate tannic stain, probably from wetland drainage. Low conductivity (0.15 mV/cm) suggests that the water is also soft.

Macroinvertebrates were collected with a D-frame net to determine the FBI (Family Biotic Index - Hilsenhoff, 1988) which is a rapid bioassessment technique for determining water quality. The FBI was calculated at 8.55, indicating "Very Poor" water quality. Based on our experience with the stream, the tolerant macroinvertebrates are probably more reflective of the stream's intermittent nature.

Electrofishing gear consisted of a battery powered backpack pulse DC shocker. Sampling approximately 300' of stream, numerous minute fish were observed but could not be collected since they easily passed through the 6mm mesh net. As an alternative, the D-frame net was used to sweep under snags in a few of the small pools. Six of the tiny fish were collected and later identified as immature central mudminnows, *Umbra limi*. Mudminnows are very tolerant of low dissolved oxygen levels since they have a functional duct from the pharynx to the swim bladder, allowing them to breathe from the atmosphere (Becker, 1983). The adjoining wetlands probably become the primary mudminnow habitat during draught years. The only other stream vertebrate observed were tadpole and adult green frogs, *Rana clamitans melanota*.

Figure 1: Spring Brook Stream Classification Macroinvertebrate and Fish Sampling Site Description

MACROINVERTEBRATE FIELD AND BENCH SHEET
Form 3200-81 Rev. 4-90 Department of Natural Resources

Sample ID # 950605-57-01 Waterbody Name Spring Brook
Y M M D D Cnty Field #

Water Temp (Celsius) 18.6 Dissolved Oxygen (mg/l) 7.3 Cond. 0.15 mv/cm

Sample Location: SW NW 17 13 N 6 E Master Waterbody # _____
1/16 1/4 Sec. Tn. Rng.

Project Name Stream Classification Storet Station # 40

Ave. Stream Width (Ft.) at Site 3 Ave. Stream Depth (Ft.) at Site 0.2

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

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

Est. % of Sample Sorted 50

Taxonomist MARSHALL, D

Location Description private road N43° 36.263' W 89° 49.096' Sampled Habitat: Riffle Run Pool Lake

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

Substrate at Site Location (%)

Bedrock	Rubble (2.5-10.0" dia.)	Sand	Clay	Muck
Boulders (10.0" dia.)	Gravel (0.1-2.5" dia.)	Silt	Detritus	Debris/Veg.

Substrate Sampled (%) (Same as above) 00

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 0 % 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	immature mudminnows collected
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	

Figure 2: Spring Brook Stream Classification Macroinvertebrate Data and FBI

Stream Name: <u>Spring Brook</u>	
Field Number: <u>1</u>	Date: <u>6-5-95</u>

	Value X Number =		Value X Number =
Plecoptera Capniidae	1	Tricoptera Psychomyiidae	2
Chloroperlidae	1	Phycophilidae	0
Leuctridae	0	Sericostomatidae	3
Nemouridae	2	Megaloptera Corydalidae	0
Perlidae	1	Sialidae	4
Perlodidae	2	Lepidoptera Pyralidae	5
Pteronarcyidae	0	Coleoptera Dryopidae	5
Taeniopterygidae	2	Elmidae	4
Ephemeroptera Baetidae	4	Psephenidae	4
Baetiscidae	3	Diptera Athericidae	2
Caenidae	7	Blephariceridae	0
Ephemereillidae	1	Ceratopogonidae	6
Ephemeridae	4	Chironomidae (Blood red)	8
Leptophlebiidae	4	Chironomidae (Other)	6
Heptageniidae	2	Dolichopodidae	4
Metretropodidae	2	Empididae	6
Oligoneuridae	2	Ephydriidae	6
Polymitarcyidae	2	Psychodidae	10
Potamanthidae	4	Simuliidae	6
Siphonuridae	7	Muscidae	6
Tricorythidae	4	Syrphidae	10
Odonata Aeshnidae	3	Tabanidae	6
Calopterygidae	5	Tipulidae	3
Coenagrionidae	9	Amphipoda Gammaridae	4
Cordulegastridae	3	Talitridae	8
Corduliidae	5	Isopoda Asellidae	8
Gomphidae	1	Totals	100
Lestidae	9		855
Libellulidae	9		
Macromidae	3		
Tricoptera Brachycentridae	1		
Glossosomatidae	0		
Helicopsychidae	3		
Hydropsychidae	4		
Hydropsilidae	4		
Lepidostomatidae	1		
Leptoceridae	4		
Limnephilidae	4		
Molannidae	6		
Odontoceridae	0		
Philopotamidae	3		
Phryganeidae	4		
Polycentropodidae	6		

FBI = 855

Classification

Although agricultural ditching has occurred in the upper watershed, low flow is the primary factor limiting the use potential of Spring Brook. The classification of Spring Brook and the intermittent tributaries downstream to the private drive above the Spring Brook Campground impoundment (N43°36.263', W89°49.096') is **Limited Forage Fish (LFF)**. Below this point, the impoundments have changed the flow characteristics with the potential to support sport fish. The remaining section of stream is therefore classified **Warm Water Sport Fish (WWSF)**.

References

- Ball, Joe. 1982. Stream Classification Guidelines For Wisconsin. WDNR Technical Bulletin.
- Becker, George C. 1983. Fishes of Wisconsin. The Univ. Wisc. Press.
- Hilsenhoff, William L. 1988. Rapid Field Assessment of Organic Pollution with a Family-level Biotic Index. J. N. Am. Benthol. Soc. 7(1):65-68.
- WDNR. 1971. Surface Water Resources of Sauk County.



Spring Brook above campground impoundment in Section 17



Spring Brook Campground Impoundment



Region <u>SCR</u>	County <u>Sauk</u>	Report Date <u>6/1/95</u>	Classification <u>LFF</u>
Water Body: <u>Spring Brook</u>			
Discharger: <u>Christmas Mountain SD</u>			

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.)
- Physical Data (flow, depth, etc.)
- Habitat Description
- Site Description/Map
- Other: photos

Historical Reports in file:

6/1/95 - Dave Marshall

Additional Comments/How to improve report:

- good report
- low flow limits use potential of Spring Brook
(-check WI region to see if flow/other factors have changed.)