STREAM CLASSIFICATION SURVEY

OF

MORREY CREEK, IOWA COUNTY

January, 1993

Prepared by

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WISCONSIN DEPARTMENT OF NATURAL RESOURCES
SOUTHERN DISTRICT

SURVEY OBJECTIVE

The purpose of the classification survey was to identify appropriate uses for Morrey Creek, below the official trout management zone, and Marsh Creek. Rapid bioassessment techniques were used to gather information on fisheries, macroinvertebrates and habitat. Supporting information included water chemistry data, file data and the Iowa County Surface Water Inventory.

WATER RESOURCES DESCRIPTION

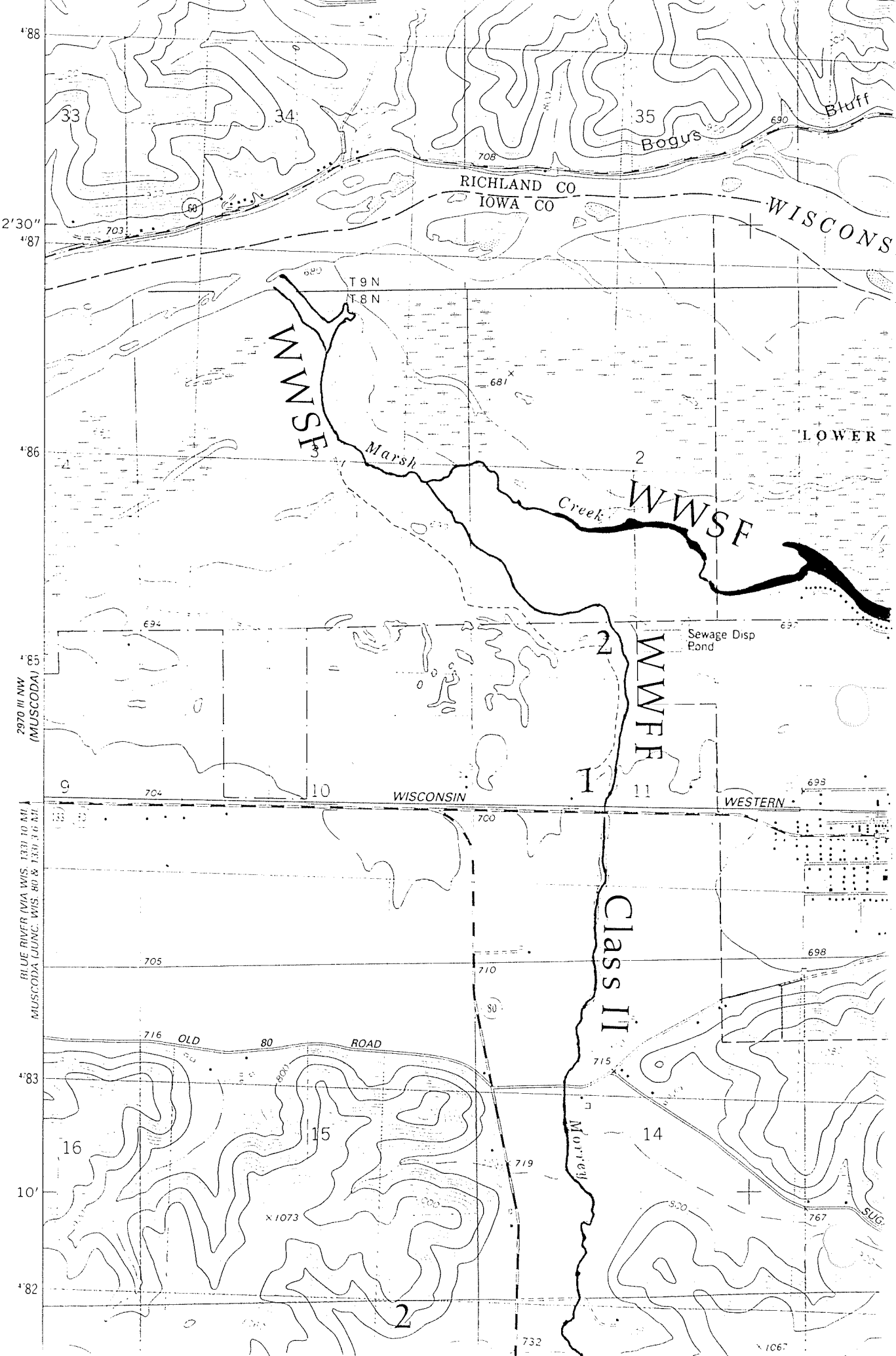
Morrey Creek originates within the bluffs surrounding the Wisconsin River, Iowa County. The small stream travels 6.3 miles north to the confluence with Marsh Creek, a Wisconsin River tributary. Overall stream gradient (25.6 ft./mile) is moderate compared to most small "Driftless Area" streams, but decreases substantially after the stream reaches the Wisconsin River valley, below Section 14, T.8-9N. - R.1E. Landuse within the watershed is predominantly agriculture (~70%) with hardwoods and pasture in the bluffs and cropland in the valley.

Typical of most small streams within the "Driftless Area", Morrey Creek supports cold water fish and aquatic life communities. The upper 4.0 miles of stream is designated Class II water and managed for brown trout. Uncontrolled pasturing, manure runoff, flooding and sedimentation are affecting trout survival and recruitment. Consequently, routine stocking is required to sustain trout angling. Stream habitat has been further degraded in the lower reaches due to channel straightening. The classified trout management area ends at Highway 133 where poor habitat and warm summer water temperatures make trout management impractical.

Morrey Creek discharges into Marsh Creek within one mile of the Wisconsin River. The lower reaches of both streams are likely to contain a wide variety of fish species which migrate from the Wisconsin River. The Lower Wisconsin River sustains diverse communities of fish and wildlife and is the focus of a regional resource protection planning effort. The Lower Wisconsin River has also been nominated "Exceptional Resources Waters" under Wisconsin's Antidegradation Policy.

Above the confluence with Morrey Creek, Avoca Lake is an enlargement of Marsh Creek. Sources of water to the 115 acre lake include Wisconsin River flood water, wetland seepage and Marsh Creek drainage. Thirty-four species of fish were identified within the combined water resources of Morrey Creek, Marsh Creek and Avoca Lake during Wisconsin's Fish Distribution Study in 1979 (Fago). The pirate perch (Aphredoderus sayanus), which is listed as a Wisconsin Special Concern Species, was collected from Morrey Creek in 1979.

Fig. I


RICHLAND CO
IOWA CO
T9N
T8N
WWSF
Marsh
Creek
WWFF
Class II
Sewage Disp Pond
WISCONSIN
WESTERN
OLD 80 ROAD
Morrey
Bogus
Bluff
LOWER
2970 III NW (MUSCODA)
BLUE RIVER (VIA WIS. 133) 10 MI.
MUSCODA (JUNC. WIS. 80 & 133) 3.6 MI.

CLASSIFICATION

Below Highway 133 to the confluence with Marsh Creek, the stream classification is warm water forage fish (WWFF). Above the Marsh Creek enlargement (Avoca Lake) downstream to the confluence with the Wisconsin River, the classification is warm water sport fish (WWSF). NR 102 outlines water quality standards established to protect five stream types. WWFF and WWSF ecosystem types are protected by the same water quality standards.

SURVEY METHODS

Macroinvertebrates: Rapid bioassessment of Morrey Creek included non-quantitative sampling with a D-frame net and calculating the Family-level Biotic Index (FBI) at two sites. Methods were developed by Hilsenhoff (1988).

Fish: A battery powered D.C. pulse backpack shocker was used for sampling fish communities within two 300 feet sections.

Habitat: STREAM SYSTEM HABITAT RATING FORM (3200-68) was used for qualitative habitat assessment of Morrey Creek below Hwy 133.

Flow: A Swoffer Model 2100 was used for metered flow. The float method (Leitritz, 1959) was used when a meter was not available.

Dissolved oxygen/temperature: YSI Model 57.

Conductivity: YSI Model 3000 T-L-C meter.

Water samples: NH3, pH, hardness, alkalinity, and suspended solids were analyzed at State Laboratory of Hygiene.

1992 SURVEY RESULTS

Macroinvertebrates collected from Sites 1 and 2 indicated excellent water quality in the stream even though signs of nonpoint source pollution were visible. Low diversity of macroinvertebrates were found at both sites and were dominated by intolerant Brachycentridae and cool water scuds (Gammarus pseudolimneus). Slightly higher benthic diversity was found at Site 1 where a riffle, created by Highway 133 bridge, was sampled. Few riffles were found in the remainder of the reach which is mostly a run with shifting sand and moderate silt deposits.

Morrey Creek habitat scored 200 and rated "fair" using the qualitative rating form. A score of 200 barely ranks within the "fair" range of 130-200. Woody vegetation shades most of the stream reach which partly explained the overall low density of bank stabilizing grasses. Frequency of eroded banks was high.

Even though FBI values indicated excellent water quality, surprisingly low density and diversity of fish were collected near sites 1 and 2. Low fish densities were partly the result of marginal habitat in the reach, which had been agriculturally ditched. Best fish habitat was found where snags and eddies scoured pools. Unfortunately, few of these sites produced fish. Considering the diversity of species found during the Wisconsin Fish Distribution Study, perhaps seasonal factors influenced fish to migrate from the stream and contributed to the poor capture rate.

Important factors influencing the classifications of Morrey Creek and Marsh Creek included the close hydrological connection of both streams with the Wisconsin River, excellent water quality displayed by the macroinvertebrate community in Morrey Creek, adequate flow and habitat sustaining warm water sport fishes in Marsh Creek and history of high fish diversity found in both streams. WWFF and WWSF best characterize existing and potential stream uses.

REFERENCES

Ball, Joe. 1981. Stream Classification Guidelines for Wisconsin. WDNR Unpublished report.

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TABLE I: MORREY CREEK WATER QUALITY DATA

Site	Mile	Date	Temp (°C)	D.O. (mg/l)	Sus Solids (mg/l)	NH_3 (mg/l)	pH (SU)	Hardness (mg/l)	Alkalinity (mg/l)	Conductivity (UMHOS/CM)	Flow (CFS)	FBI	Habitat Rating
1	1.4	10-30-92	6.7	9.9								2.6	fair
		11-09-92	8.0	12.5	12	.051	8.2	270	262	505	3.5		
		11-11-92	6.1	13.0	16	.049	8.2	280	263	507	3.2		
2	0.8	11-06-92	4.1	11.4							4.5*	3.1	fair

*Float method (Leitritz, 1959)

Ave. gradient = 25.6 ft./mi. (entire stream)

Ave. width = 8 feet (WWFF section)

Ave. depth = 0.7 feet (WWFF section)

Table 2: Morrey Creek Macroinvertebrate Data
Site 1
October 30, 1992

Family	Number	Value	No. x Value
Baetidae	1	4	4
Brachycentridae	45	1	45
Hydropsychidae	2	4	8
Elmidae	2	4	8
Chironomidae	1	6	6
Tipulidae	1	3	3
Gammaridae	43	4	172
Total	95		246

FBI (246/95) = 2.59 Indicating "Excellent" water quality

Site 2
November 6, 1992

Brachycentridae	30	1	30
Chironomidae	1	6	6
Tipulidae	1	4	4
Gammaridae	65	4	260
Total	97		299

FBI (299/97) = 3.08 Indicating "Excellent" water quality

Table 3: Morrey Creek Fisheries Data
Site 1
October 30, 1992

Species	Common Name	Number
Salmo trutta	brown trout	3
Semotilus atromaculatus	creek chub	6
Cyprinidae	unidentified shiner	1

Site 2
November 6, 1992

Salmo trutta	brown trout	1
Semotilus atromaculatus	creek chub	1
Cyprinidae	unidentified shiner	1

Table 4: Previous Morrey Creek Fisheries Data
July 19, 1979
Mile 1.4

Species	Common name	Number
Umbra limi	central mudminnow	1
Esox lucius	northern pike	4
Notropis cornutus	common shiner	1
Catostomus commersoni	white sucker	61
Aphredoderus sayanus	pirate perch	1

July 26, 1979
Mile 5.5

Salmo trutta	brown trout	3
Campostoma sp.	stoneroller	25
Campostoma anomalum	central stoneroller	6
Notropis cornutus	common shiner	2
Phoxinus erythrogaster	s. redbelly dace	1
Rhinichthys atratulus	blacknose dace	4
Semotilus atromaculatus	creek chub	86
Catostomus commersoni	white sucker	>99

Table 5: Marsh Creek Fisheries Data
July 19, 1979
Mile 8.5

Umbra limi	central mudminnow	6
Esox lucius	northern pike	1
Lota lota	burbot	1
Lepomis cyanellus	green sunfish	1

Table 6: Avoca Lake Fisheries Data
July 19, 1979
Mile 2.9

Umbra limi	central mudminnow	1
Esox sp	pike family	3
Esox americanus verm.	grass pickerel	1
Esox lucius	northern pike	10
Cyprinus carpio	common carp	6
Notropis spilopterus	spotfin shiner	1
Pimephales notatus	bluntnose minnow	4
Pimephales vigilax	bullhead minnow	1
Carpiodes	carpsucker	2
Ictiobus	buffalo	2
Carpiodes carpio	river carpsucker	3
Carpiodes cyprinus	quillback	5
Carpiodes velifer	highfin carpsucker	3
Ictiobus cyprinellus	bigmouth buffalo	1
Minytrema melanops	spotted sucker	1
Lota lota	burbot	2
Lepomis gulosus	warmouth	1
Lepomis macrochirus	bluegill	30
Micropterus dolomieui	smallmouth bass	1
Micropterus salmoides	largemouth bass	25
Etheostoma caeruleum	rainbow darter	1
Etheostoma nigrum	johny darter	1
Perca flavescens	yellow perch	1
Stizostedion vitreum	walleye	3