

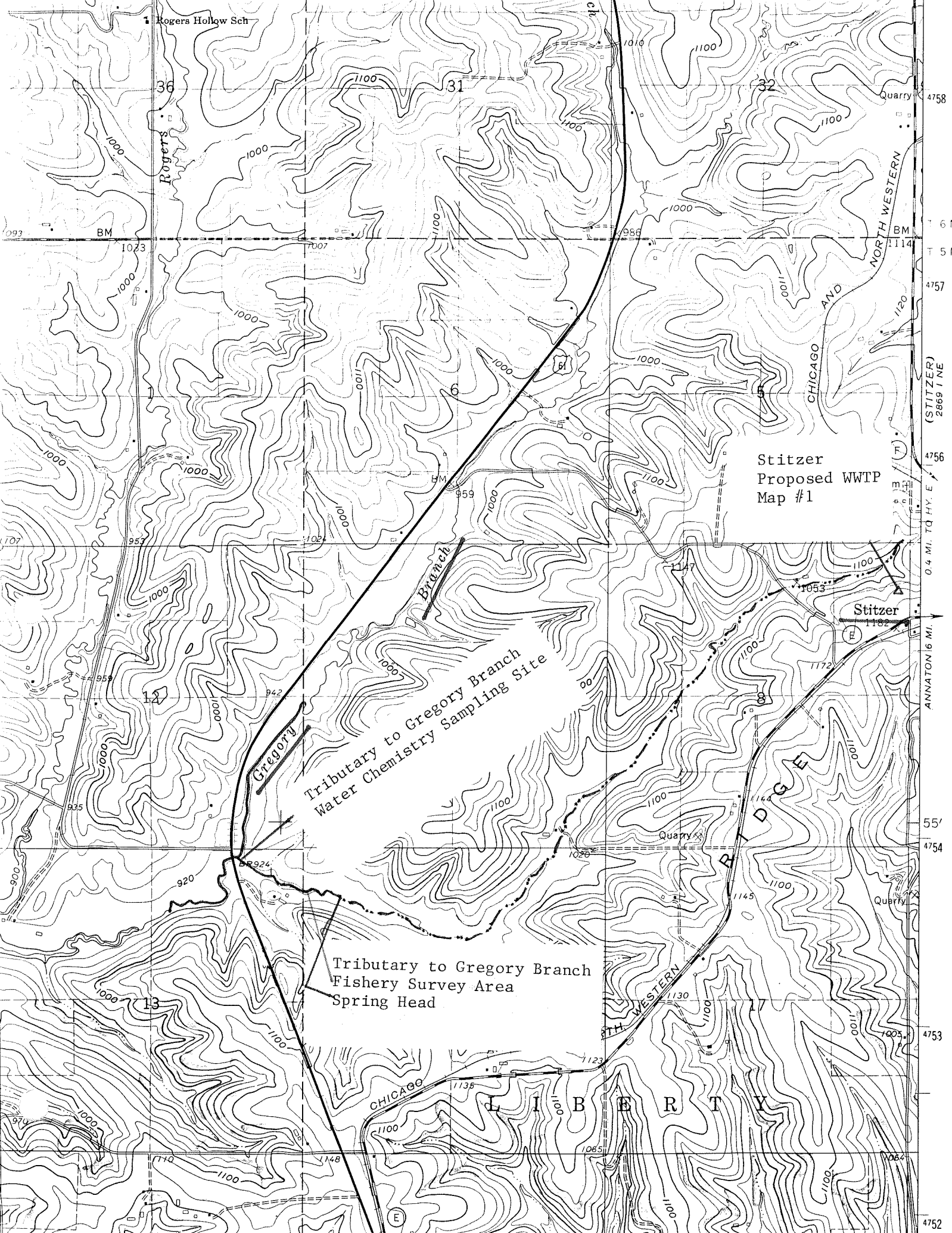
Stitzer-Grant County
Southern District
Stream Classification
Tributary to Gregory Branch
Proposed Discharge Site

5/17/85

A request for effluent limits from a proposed WWTP at Stitzer was received by the Department. A stream classification was conducted on a tributary to Gregory Branch (the proposed receiving stream) in May 1985. No WWTP presently exists in Stitzer.

The proposed discharge site is located on the west edge of Stitzer (Map #1). The effluent would flow into the headwater area of an intermittent tributary to Gregory Branch. The tributary is intermittent until a large spring enters it a short distance upstream of the west boundary of section 18. The spring is located on the John Batko farm.

The tributary above the spring normally only carries runoff water but may have minimal flow in some sections during wet periods of the year. A makeshift runoff control structure is located on the Maier property just below the boundary with the John Michel farm. Any flow above this point would be diverted into the earthen structure. It is unknown how much water could be handled by the structure before it would overflow or be bypassed. It looked like it was constructed to protect downstream



Rogers Hollow Sch

36

31

32

Quarry

4758

BM

1023

7007

986

BM

1114

T 5

4757

CHICAGO AND NORTH WESTERN

Stitzer
Proposed WWTP
Map #1

(STITZER)
2869 1 NE

4756

0.4 MI. TO HY. E

ANNATON 16 MI.

55'

4754

55'

4753

55'

4752

Gregory Branch

Tributary to Gregory Branch
Water Chemistry Sampling Site

Gregory

Tributary to Gregory Branch
Fishery Survey Area
Spring Head

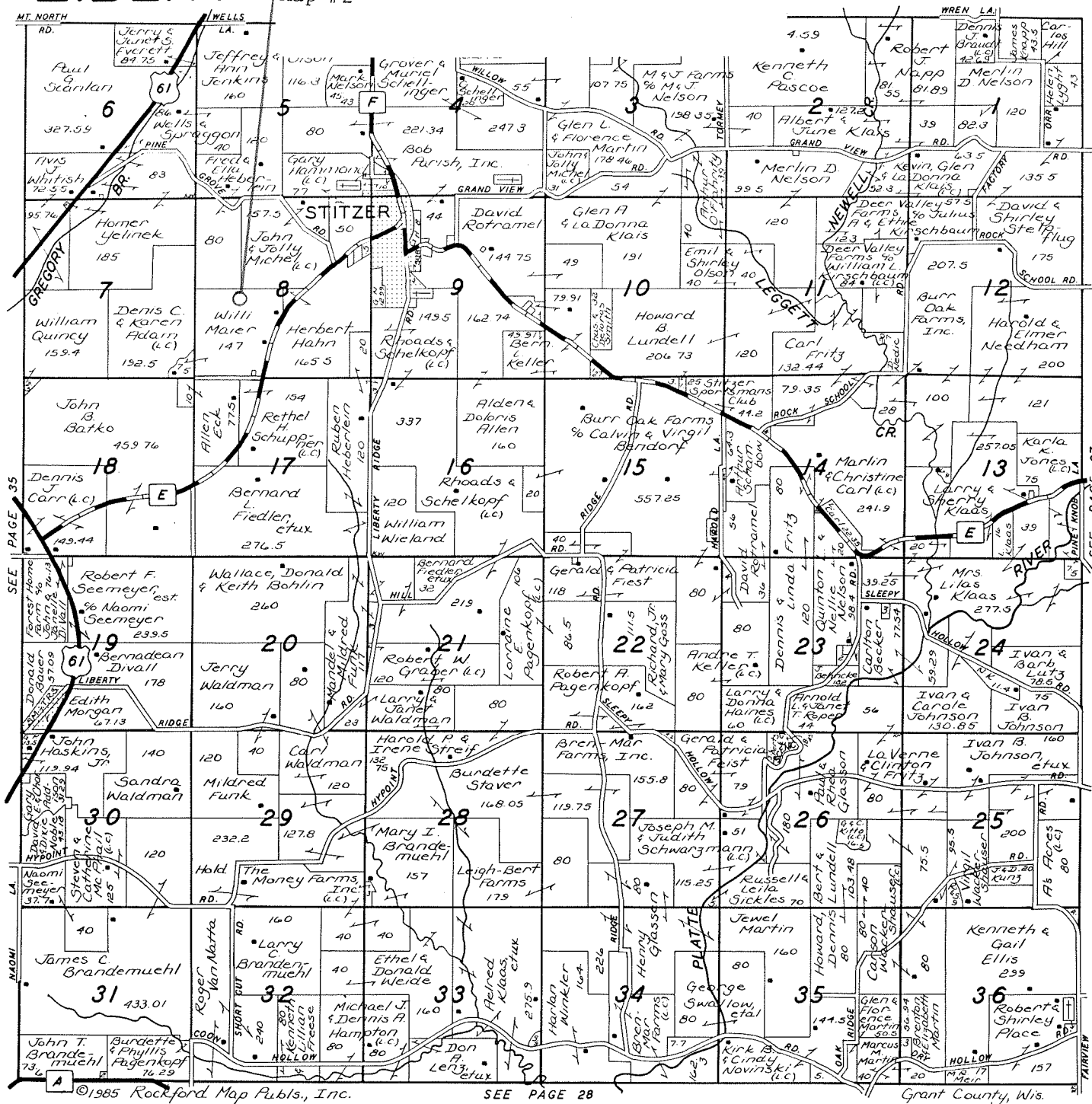
LIBERTY RIDGE

CHICAGO

LIBERTY

LIBERTY Stitzer Runoff Control Structure Map #2

T.5N.-R.2W.



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Stitzer, Wisconsin

cropland. A corn field was located below it on the day of the investigation.

The tributary's corridor has a multiple number of uses. Parts are pastured or in corn or hay fields. Runoff from these sources vary from light to heavy along with runoff from barnyards. Between the west boundary of the John Batko farm and the juncture with the Gregory Branch, a barnyard-pasture area has a significant impact on the tributary. Bank vegetation is sparse and soil erosion is heavy.

The spring head on the Batko farm has to be one of the most impressive in Grant County. The stream is crystal clear below the spring and 50 percent of the streambed is covered with water cress. Gravel-rubble covered most of the streambed. But the stream changes dramatically below the Batko property line due to the barnyard-pasture area. Most of the watercress is gone, habitat is sparse, and the streambed is composed a lot more silt-sediment.

A macroinvertebrate sample was taken just east of the Batko property line. Macroinvertebrates were collected in only riffle areas with a D-frame net (1 mm² mesh). The net was held downstream and the substrate above it was disturbed, dislodging the macroinvertebrates, which were then carried into the net by the current. The riffles sampled consisted of primarily gravel-rubble, which provided for good macroinvertebrate attachment. After 100+ macroinvertebrates were collected, samples were deposited in a jar containing 95 percent ETOH for preservation and laboratory sorting.

Photographs were taken at each site along with the identification of flow characteristics, width, depth, bank type, aquatic vegetation, substrate, and surrounding land use.

Laboratory procedures consisted of completely mixing the macroinvertebrate sample and then evenly distributing it across a gridded tray. The sample was picked for a 100 count; or if there were not 100 organisms, until all the arthropods had been removed from the sample.

Chironomids were mounted on slides using Turtox CMCP 10 and identified to the lowest taxonomic level possible. A taxonomic list was prepared for the site (Table III) and a biotic index value was assigned. The Biotic Index used (which is an indicator of water quality) was developed by Dr. Hilsenhoff and is published in DNR Technical Bulletin Number 132. The Biotic Index was calculated from the formula:

$$B.I. = \frac{\sum (n \times a)}{N}$$

where (n) is the number of individuals in each species or genus, (a) is the index value for that species or genus and N is the total number of individuals in the sample which have assigned biotic index values.

Dr. Hilsenhoff's biotic index values range from 0-5 with 0 indicating very intolerant organisms and 5 indicating very tolerant organisms.

Water quality determinations from biotic index values are listed in Table I.

Table I - Water Quality Determinations from Biotic Index Values

<u>Biotic Index</u>	<u>Category</u>	<u>Evaluation</u>
0 - 1.75	Excellent	No Organic Pollution
1.76 - 2.25	Very Good	Possible Slight Organic Pollution
2.26 - 2.75	Good	Some Organic Pollution
2.76 - 3.50	Fair	Significant Organic Pollution
3.51 - 4.25	Poor	Very Significant Organic Pollution
4.26 - 5.00	Very Poor	Severe Organic Pollution

The macroinvertebrate results are contained in Table III. According to the Biotic Index the site had "Very Good Water Quality".

The stream was evaluated using the "Stream Classification Guidelines for Wisconsin" developed by Joe Ball. The streams habitat was assessed with the "Stream System Habitat Rating Form". The Stream System Habitat Rating Form is located in the appendix. The section of stream from the proposed discharge site downstream to the spring head received a reach score of 241 and was considered to have poor habitat.

Table II - Tributary to Gregory Branch, Water Chemistry Sample

Date: 6/10/85

Time: 11:45

<u>Parameter</u>	<u>Test results</u>
Temp. (°C)	11.0
D.O. (mg/l)	9.7
Field pH (su)	7.6
BOD ₆ (mg/l)	1.2
S.S. (mg/l)	46
Lab. pH (su)	7.7
NH ₃ -N (mg/l)	0.02
NO ₂ -N+NO ₃ -N (mg/l)	3.7
TKN (mg/l)	0.4

Recommendations

The tributary above the spring head in Section 18 normally only carries runoff water but may have minimal flow in some sections during wet periods of the year. No fish are present and at the most a minimal tolerant macroinvertebrate community. Also, the stream channel directly below the runoff control structure was planted in corn. For these reasons the tributary from the discharge site downstream to the spring head should be classified as "Marginal" (E).

From the spring head downstream to the juncture with the Gregory Branch the stream contains a fair number of trout. Also, the spring has to be one of the nicest in Grant county. This section of stream should be classified as "Full Fish and Aquatic Life" (A).

Fishery information was collected with a backpack shocker from the Batko property line east to the spring head. Fish captured included sticklebacks, johnny darters, white suckers, sculpins, and the following trout:

Brown Trout	9"
Brown Trout	8"
Brook Trout	13"
Brown Trout	8"
Brown Trout	11"
Brown Trout	9"
Brown Trout	10"
Dead Brook Trout	15"

The fish were all in excellent condition and had vivid coloration. The dead brook trout had several puncture wounds and was probably killed by a heron or similar bird. The fish migrate into the tributary from Gregory Branch which is presently managed as a trout stream.

Water chemistry samples were collected in the tributary just before the juncture with the Gregory Branch. Sample results are contained in Table II. According to the results the stream has good water quality.

Table III Taxonomic list of macroinvertebrates for ST 1

Date: 5/17/85 (Tributary to Gregory Branch)

(TSN; R2W; Sec. 1B; 1/4 1/4, NWNW) (Below Batko Spring)

ORDER	FAMILY	GENUS/SPECIES	NUMBER OF INSECTS (n)	BIOTIC INDEX VALUE (a)	a x n
DIPTERA	CHIRONOMIDAE	Diamesa spp.	35	2	70
EPHEMEROPTERA	BAETIDAE	Baetis brunneicolor	4	2	8
AMPHIPODA	GAMMARIDAE	Gammarus pseudolimneus	67	2	134
Totals			106		212

Biotic Index = $212 / 106 = 2.00$ Very Good

Tributary to Gregory

Stream Branch Reach Location Proposed Discharge Site Downstream Reach Score/Rating 241/Poor
to the Spring Head
 unty Grant Date 5/17/85 Evaluator Roger Schlessner Classification Marginal/F

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 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:	0	0	73	168

Column Scores E 0 +G 0 +F 73 +P 168 = 241 = Score

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



Stitzer

Headwater area of
Tributary to Gregory Br.,
possible discharge area.



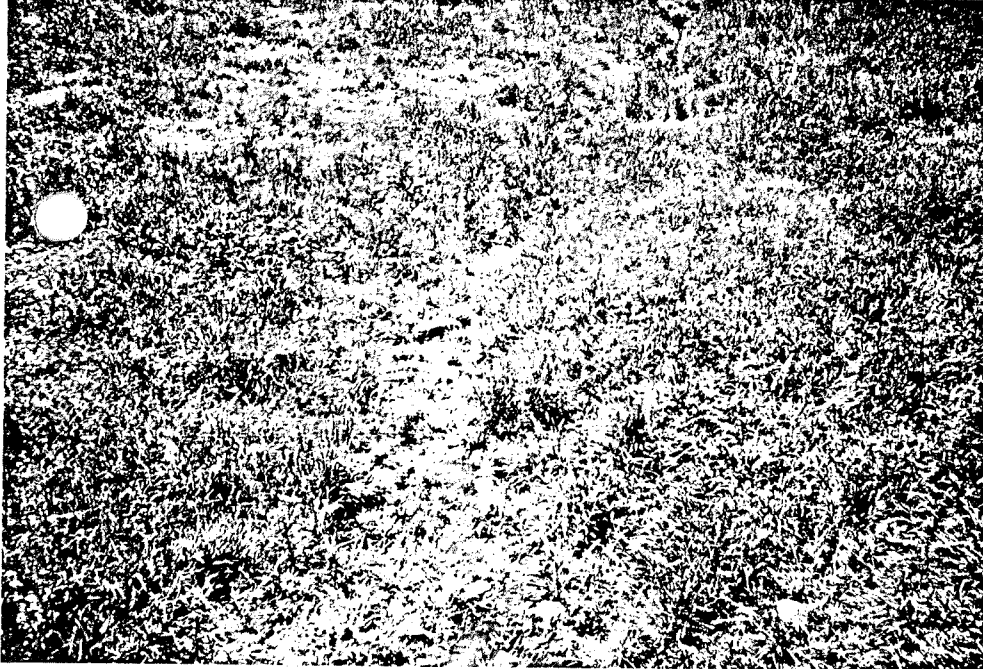
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Tributary to Gregory Br.,
above Pine Grove Road,
John Michel Farm.



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Tributary to Gregory Br.,
above Pine Grove Road.



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Tributary to Gregory Br.,
below Pine Grove Rd.



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Tributary to Gregory Br.,
below Pine Grove Road.



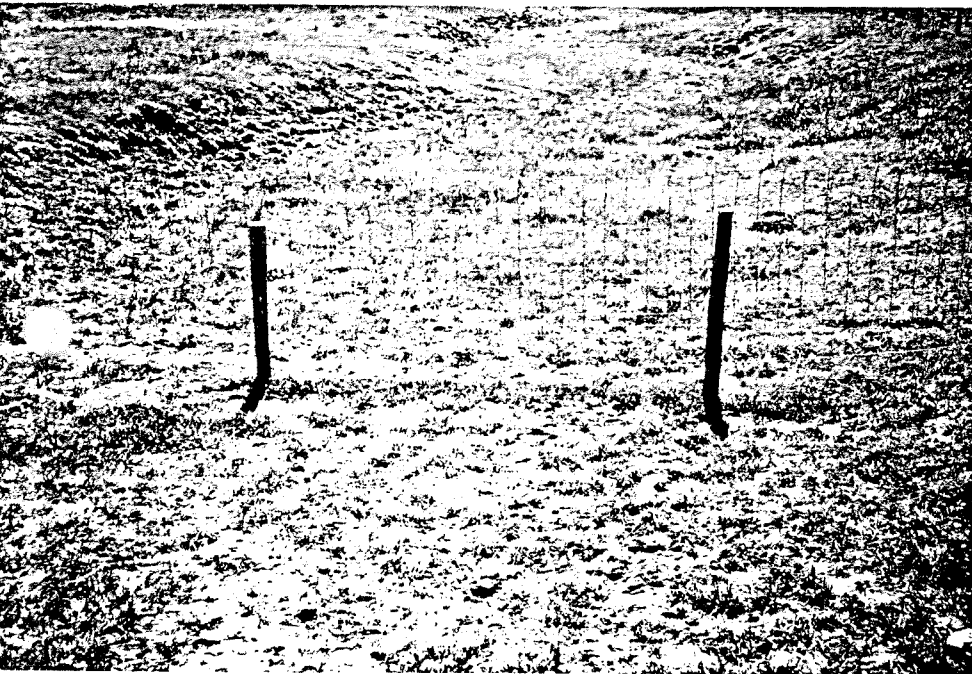
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Tributary to Gregory Br.,
above private drive to
Willi Maier Farm, Sec. 7.



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Tributary to Gregory Br.,
above private drive to
Willi Maier Farm, Sec. 7.



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Tributary to Gregory Br.,
below private drive to
Willi Maier Farm, Sec. 7.



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Tributary to Gregory Br.,
above Spring Head.



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Tributary to Gregory Br.,
Spring Head on John Batko
farm.



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Tributary to Gregory Br.,
Spring Head.



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Tributary to Gregory Br.,
fish survey Brown Trout.



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Tributary to Gregory Br.,
fish survey Brook Trout



Stitzer

Tributary to Gregory Br.,
below Spring Head.



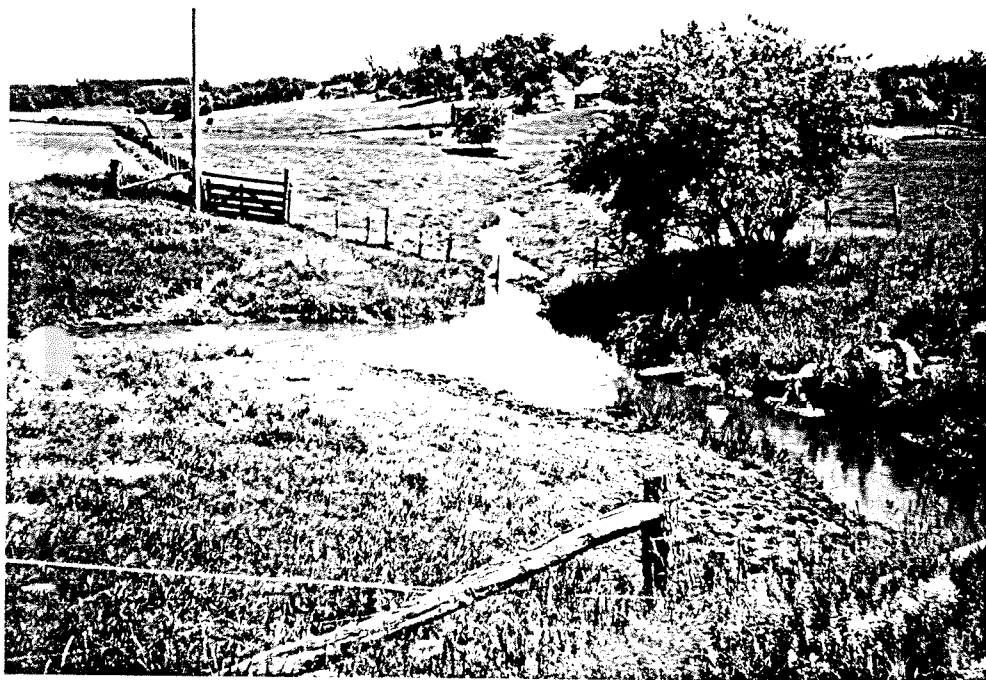
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Tributary to Gregory Br.,
below Spring Head.



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Tributary to Gregory Br.,
dead Brook Trout.



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Juncture of Tributary and
Gregory Branch.