

MINNESOTA DEPARTMENT OF NATURAL RESOURCES

RIVER OR STREAM SURVEY

DATE(S) OF FIELD WORK Various June, July, August 1985

Initial Survey   
Resurvey

LEADER Dale H. Sogla  
ASSISTANT(S) Rory Freiermuth, Mark Stopyro

NAME, LOCATION, AND FLOW CHARACTERISTICS

- (1) Stream Name Willow Creek
- (2) Alternate Name(s) none
- (3) Tributary Number M-34-73-1
- (4) Counties Olmsted
- (5) Watershed Name and Number Zumbro River - 35
- (6) Sequence of Waterways to Basin to Bear Creek to South Fork Zumbro River to Zumbro River to Mississippi River
- (7) Map(s) Used USGS Quadrangles: Salem Corners, Mn - 1974; Simpson, Mn - 1974
- (8) Length of Stream 11.3 miles
- (9) Average Width - Upper Station 8.7 feet Lower Station 10.8 feet
- (10) Mouth Location T. 106N. R. 14W. S. 12
- (11) Flow at Mouth 4.1 cfs, Date 060485
- (12) Flow at Gaging Station - Minimum \_\_\_\_\_ cfs Average \_\_\_\_\_ cfs
- (13) Location of Gaging Station none
- (14) Initial Source of Sustained Flow tile drainage NE 1/4 S.17, T.105N., R.14W.
- (15) Gradient 21 feet/mile
- (16) Sinuosity 1.5

WATERSHED DESCRIPTION AND USE

- (17) Description of Watershed (soil types, cover types, topography, land usage and ownership)
- a) Entire watershed The lower 3.3 miles of stream flow through flood plain consisting of nearly level, silty soils. This area is partially developed for commercial interests. From mile 3.3 to 9.3 the stream flows through gently sloping, well drained agricultural lands and a golf course with loam and silty loam soils. The upper area is nearly level, poorly drained agricultural land with silty loam soils.
- b) Land adjacent to stream Land use adjacent to the stream is 46% wild grasses and willow, 22% wooded, and 32% pasture and wooded pasture. All land is privately owned.

GENERAL INFORMATION ON THE STREAM

(18) Reason for Survey Initial survey for inventory and management purposes requested by Area Fisheries Supervisor.

(19) Previous Investigations and Surveys A Survey of the Fisheries Resources in South Zumbro Watershed Streams, Dodge and Olmsted Counties: Progress Report, Haugstad, April 1975.

(20) Special Problems or Conditions Residential development and some industrial development is increasing along the stream. Agricultural land use practices in the uplands and pasturing adjacent to the stream cause poor stream physical characteristics.

(21) Sources of Pollution

Source	Loc. (mi. from mouth)	Substance discharged
non-point - agriculture	4.0-11.3	animal wastes, herbicides

(22) Erosion

Type	Degree	Affected reach
bank	slight to moderate	entire stream length

(23) Stream Alterations (dredging, channeling) -- location and date Mile 1.5-2.0, May-June 1985. Mile 2.5-3.3 (date unknown)

(24) Dams and other obstructions (include beaver dams)

Type	No.	Mi. from Mouth	Head (ft.)	Length of Dam	Type of Control Structure	Use	Fish Barrier	Owner	Condition or Status
beaver	(8)	6.2-6.5	2-6		NA	NA	yes	NA	active
beaver	(3)	7.8	2-5		NA	NA	yes	NA	active
beaver	(2)	8.3	5		NA	NA	yes	NA	active
beaver	(1)	8.5	5		NA	NA	yes	NA	active

(25) Use of Water: Fishing \_\_\_\_\_ Recreation \_\_\_\_\_ Commercial navigation \_\_\_\_\_ Power \_\_\_\_\_ Irrigation \_\_\_\_\_  
 Livestock watering  Other (specify) \_\_\_\_\_

(26) Access (location and ownership) Access is from public right-of-ways.

(27) Shoreline Developments Willow Creek Country Club, mile 5.4 to mile 5.8. Development is in progress from the mouth to 3.5 miles from the mouth, mainly for commercial purposes.

(28) Recreational Boating - a) Navigable reach None  
 b) Type of boating \_\_\_\_\_



(30) Stream Physical Characteristics

315                      316                      317                      317.1

a)	Station no.	1	2	3A	3B
b)	Date	060485	060485	060485	060485
c)	Loc. (mi. from mouth)	1.3	3.7	5.4	9.6
d)	Length of station (ft.)	1,000	700	1,056	801
e)	% of station in:				
	Pools	96		73	72
	Riffles and rapids	4		27	28
	Runs				
	Other (list) (flat)		100		
f)	Average width (ft.)	10.8	14.0	11.9	8.7
g)	Average depth (ft.)	1.3	0.4	0.9	0.7
h)	Flow (cfs)	3.7	2.5	2.6	0.4
i)	High water mark (ft.)	5.0	6.0	6.0	6.0
j)	Present stream stage (high, normal, low)	low	low	low	low
k)	Banks:				
	Average height (ft.)	4	6	7	5
	Height range (ft.)	1-6	2-12	2-12	1-6
	Erosion (lt., mod., severe)	light	moderate	moderate	moderate
	% grazed	15	0	0	75
	% ditched or channeled	34	0	0	0
l)	Shade <sup>1</sup>	moderate	heavy	moderate	moderate
m)	Pools <sup>2</sup>				
	Average width (ft.)	11.0		13.2	9.5
	Width range (ft.)	9.0-15.0		8.0-21.0	7.0-13.0
	Average depth (ft.)	1.3		1.1	0.8
	Maximum depth (ft.)	3.1		2.6	1.4
	Type - No. of each				
	A				
	B	1		3	
	C	1			
	D	1	1	9	5
	Bottom type - % <sup>3</sup>				
	rubble			8	8
	gravel	10		15	13
	sand	23		25	16
	silt	64		52	63
	clay	3			
n)	Riffles and rapids				
	Average width (ft.)	6.0		8.3	6.8
	Width range (ft.)	5.0-7.0		5.0-15.0	5.0-10.0
	Average depth (ft.)	0.5		0.5	0.3
	Maximum depth (ft.)	0.7		0.9	0.5
	Max. velocity range (fps)	ND		ND	ND
	Bottom type - %				
	rubble			24	31
	gravel	60		49	35
	sand	20		15	20
	silt	20		12	14

(30) Stream Physical Characteristics (continued)

o) Runs:				
Average width				
Width range				
Average depth				
Maximum depth				
Max. velocity range (fps)				
Bottom type -- %				
Other (describe)		flat		
Average width (ft.)		14.0		
Width range (ft.)		12.0-18.0		
Average depth (ft.)		0.4		
Maximum depth (ft.)		1.1		
Max. velocity range (fps)				
Bottom type -- %				
rubble		tr.		
gravel		2		
sand		91		
silt		7		

DATA PERTAINING TO SIMILAR REACH

q) Location (mi. to mi.)	0.0-3.3	3.3-4.4	4.4-11.3	4.4-11.3
r) Gradient (ft./mi.)	10.3	21.8	22.8	22.8
s) Sinuosity	1.5	2.6	1.7	1.7
t) Channel changes (slight, mod., exten.)	moderate	slight	slight	slight

Remarks \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

<sup>1</sup>Shade:

- light 0-25 percent shaded
- moderate 26-75 percent shaded
- heavy over 75 percent shaded

<sup>2</sup>Pool types:

- Type A - Good cover, 3 ft. or deeper
- B - Good cover, less than 3 ft.
- C - Poor cover, 3 ft. or deeper
- D - Poor cover, less than 3 ft.

<sup>3</sup>Bottom types:

- Ledge rock - large mass of solid rock
- Boulder - over 10" in diameter
- Rubble - 3" to 10" in diameter
- Gravel - 1/8" to 3" in diameter
- Sand - less than 1/8" in diameter
- Silt - fine material with little grittiness
- Clay - compact, sticky material
- Muck - decomposed organic material, usually black
- Detritus - organic material composed of sticks, leaves, decaying plants, etc.
- Marl - calcareous material

(31) Characteristics of Water

a) Station no.	3A			
b) Date	080685			
c) Loc. (mi. from mouth)	5.4			
d) Length of station (ft.)	1,056			
e) Time	1130			
f) Air temp. °F.	81			
g) Water temp. °F.	71			
h) Color	clear			
i) Cause of color				
j) Secchi disc. (ft.)	2.0(max.depth)			
FIELD DETERMINATIONS:				
Diss. oxygen (ppm)	:			
Free carbon dioxide (ppm)				
FIELD DETERMINATION OR LABORATORY ANALYSIS				
(Indicate by F or L)	L			
Total alkalinity (ppm)	255			
Conductivity (micromhos/cm)				
pH	7.9			
LABORATORY ANALYSIS				
Total nitrogen (ppm)				
NH <sub>3</sub> (ppm)				
NO <sub>2</sub> (ppm)				
NO <sub>3</sub> (ppm)				
Total phosphorus (ppm)	0.075			
Orthophosphates (ppm)				
Sulfate ion (ppm)				
Chloride ion (ppm)				
B.O.D. (ppm)				
or C.O.D. (ppm)				
Turbidity (JTU)				
Tot. diss. solids (ppm)	360			

Remarks \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



(33) Biological Characteristics

a) Station' no.	1	2	3A	3B
b) Date	060485	060485	060485	060485
c) Loc. (miles from mouth)	1.3	3.7	5.4	9.6
d) Length of station (ft.)	1,000	700	1,056	801
e) Aquatic plants or filamentous algae: <sup>1</sup> *				
Species	Abundance	Abundance	Abundance	Abundance
Filamentous algae	C		P	
Potamogeton spp.		P	P	
Ranunculus spp.				O
Lemna minor				O
Typha latifolia				P
Sagittaria latifolia				P

f) Distribution of aquatic plants The upper 1.7 miles of stream supports most of the aquatic vegetation.

g) Common invertebrates: \*  
 order or family (check blank if present)

Decapoda	X	X	X	X
Plecoptera	X		X	X
Ephemeroptera	X		X	X
Trichoptera	X		X	X
Gastropoda	X		X	X

Remarks \*Invertebrate sampling was done qualitatively by visual inspection; therefore, lists may be incomplete.

<sup>1</sup>Plant or algae abundance:

- A - abundant
- C - common
- O - occasional
- R - rare
- P - present



(34) Fishery Characteristics

a)	Station no.	1		2		3A		3B	
b)	Date	060585		060585		060785		060585	
c)	Loc. (miles from mouth)	1.3		3.7		5.4		9.6	
d)	Length of station (ft.)	1,000		700		350		801	
e)	Gear	Two backpack shockers						One backpack shocker	
f)	Amt. of sampling effort	One upstream run				*		One upstream run	
g)	Species Present	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
	Central stoneroller	Abundant		Occasional		569	14.6	Occasional	
	Carp	Present							
	Brassy minnow	Rare				1	tr.		
	Common shiner	Common		Occasional		59	1.8		
	Bigmouth shiner					81	0.4	Present	
	Southern redbelly dace					1	tr.		
	Bluntnose minnow	Common		Rare		19	0.2	Abundant	
	Fathead minnow	Common		Rare		2	tr.	Abundant	
	Bullhead minnow	Present							
	Blacknose dace	Common		Occasional		186	1.2	Common	
	Longnose dace	Rare		Occasional		129	0.8		
	Creek chub	Abundant		Common		241	5.7	Common	
	White sucker	Abundant		Occasional		114	8.5	Occasional	
	Golden redbelly	Occasional							
	Brook stickleback					9	tr.	Occasional	
	Fantail darter			Occasional		98	0.4	Occasional	
	Johnny darter	Common		Occasional		133	0.3	Abundant	

h) Gamefish young-of-year

Species:

none									

Remarks \*Station 3A was blocked with a seine and two upstream electrofishing runs were made. The initial run produced 84% of the total fish captured and the second run 16%. The low number of fish captured during the second run indicated a very high percentage of fish present were captured.



(37) Escape Cover for Gamefish

Similar reach	Type <sup>1</sup> and Amount <sup>2</sup> of Cover
0.0-3.3	LJ-S OV-0
3.3-4.4	none
4.4-11.3	OV-0 UB-0

<sup>1</sup>Cover types:

- LJ -- log jam
- B -- boulders
- OV -- overhanging vegetation
- UB -- undercut bank
- IV -- instream vegetation

<sup>2</sup>Amount of cover:

- S -- scarce
- O -- occasional
- F -- frequent

(38) Portion of Stream Suitable for Gamefish      None.

Species	Suitable Reach (mi. to mi.)

(39) History of Stream and Fishing Conditions

a) Comparisons with past investigations and surveys. Comparison of electrofishing results in station 3A between 1975 and 1985 show similar species composition (Table 1 - attached). Several species were more abundant during 1985 sampling including stoneroller spp., common shiner, blacknose dace, longnose dace, creek chub, white sucker, fantail darter, and johnny darter.

b) History of fishing conditions: No evidence of fishing pressure was noted during the survey.

Table 1. Comparison of electrofishing results in station 3A, 1975 and 1985, Willow Creek.

<u>Species</u>	<u>Number</u>		<u>Weight (lbs.)</u>	
	<u>1975</u>	<u>1985</u>	<u>1975</u>	<u>1985</u>
Stoneroller spp.	19	569	1.0	14
Brassy minnow	1	1	tr.	tr.
Common shiner	20	59	0.7	1.8
Bigmouth shiner	96	81	0.6	0.4
Southern redbelly dace	0	1	0	tr.
Bluntnose minnow	19	19	0.2	0.2
Fathead minnow	2	2	tr.	tr.
Blacknose dace	21	186	0.3	1.2
Longnose dace	28	129	0.4	0.8
Creek chub	89	241	3.9	5.7
White sucker	45	114	10.7	8.5
Brook stickleback	2	9	tr.	tr.
Fantail darter	12	98	0.1	0.4
Johnny darter	26	133	0.1	0.3



(40) Discussion of Fishery (continued)

b) Fish management problems Poor physical characteristics limit potential for game fish management in Willow Creek.

(41) Ecological Classification of Waterway Class IV - Rough fish-forage fish

(42) Summary Willow Creek has poor physical characteristics limiting game fish management potential. Residential and industrial development and agricultural land use create marginal fish habitat.

(43) Credits and Signatures

a) Funding F-29-R-5

b) Field work by

Name of crew leader Dale Sogla

Name of aide(s) Rory Freiermuth  
Mark Stopyro

c) Completed report by

Name Dale Sogla

Title N.R. Technician

Approved by

William M. Johnson  
Regional Fisheries Manager

Date

4/30/86

Typist's Initials: bkd

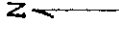
Station descriptions for Willow Creek -

- Station 1 - Begins at the confluence of tributary M-34-73-1-1 and continues upstream 1,000 feet. T.106N.,R.14W.,S.13
- Station 2 - Begins at 40th St. bridge and continues upstream 700 feet to the foot of a temporary island. T.106N.,R.14W.,S.23
- Station 3A - Begins at the bridge on the east side of Willow Creek Golf Course and continues upstream 1,056 feet to the head of a pool where a black tile line enters on the right ascending bank. T.106N.,R.14W.,S.34
- Station 3B - Begins at the fenceline above Co. Rd. 16 and continues upstream 801 feet. T.105N.,R.14W.,S.9

Stream Name (Alternate Name in parenthesis) Willow Creek	Upper End I.R.S. 105N.,14W.,17	Lower End I.R.S. 106N.,14W.,12	Tributary Number M-34-73-1
Reach (mile to mile) 0.0-11.3	Ecological Classification Class IV	Counties Olmsted	
Management Goal: No management other than environmental protection is warranted.			
Stocking Recommendations: None.			
Habitat Improvement Recommendations: None.			
Land Acquisition Recommendations: None.			
Other Recommendations: None.			
Additional Survey Work Recommended: None.			
Area Fisheries Supervisor's Signature <i>Gay L. Bates</i>		Date 04/18/86	
Regional Fisheries Supervisor's Signature <i>William D. Johnson</i>		Date 4/30/86	



WILLOW CREEK  
M-34-73-1  
OLMSTED COUNTY



SCALE 2 5/8" = 1 Mile

