

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
SURFACE WATER QUALITY DIVISION
May, 1989

STAFF REPORT

A BIOLOGICAL SURVEY OF HANNAH CREEK
IN THE VICINITY OF MICHIGAN LIMESTONE
CEDARVILLE, MICHIGAN
MACKINAC COUNTY
AUGUST 2, 1988

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A biological survey of Hannah Creek was performed on August 2, 1988 in the vicinity of the Michigan Limestone - Cedarville outfall 002 discharge (quarry drainage and noncontact cooling water). The objective of the survey was to evaluate the effect of the discharge on water quality.

FINDINGS AND CONCLUSIONS

Good stream quality was present in Hannah Creek based on benthic macroinvertebrate and water chemistry results, and habitat conditions.

METHODS

One station (Station 1), located downstream of the Michigan Limestone outfall 002 discharge, was sampled on Hannah Creek (Figure 1). Data were collected on water quality, benthic macroinvertebrates and stream characteristics. An additional station (Station 2), located downstream of the Michigan Limestone outfall 001 discharge to Lake Huron, was sampled for water quality alone.

Macroinvertebrates were sampled using a triangular dip net and by hand picking all available substrates. Sampling was continued until no new taxa were found. Taxa were identified as collected with unknown forms preserved and returned to the Water Quality Appraisal Unit (WQAU) laboratory for identification.

Water samples were collected and preserved according to laboratory procedures. Samples were placed on ice and returned to the Environmental Laboratory in Lansing for analysis.

Stream observations were recorded on Stream Survey Cards (attached).

RESULTS AND DISCUSSION

The outfall 002 discharge from Michigan Limestone - Cedarville discharges into the headwaters of Hannah Creek. The headwater area is a wetland with no well defined stream channel until Swede Road, a distance of approximately 3/4 mile (Figure 1). The outfall 001 discharge, comprised of water used to improve screening of dolomitic limestone, passes through the wetland prior to discharge to Lake Huron.

The substrate of Hannah Creek at Swede Road was primarily sand and gravel. The stream was clear with a slight amber color, and an estimated flow of 4 cfs.

The benthic macroinvertebrate community of Hannah Creek was indicative of good stream quality (Table 1). A total of 13 macroinvertebrate taxa were identified, including mayflies and caddisflies. Although fish were not collected during this survey, creek chubs, and unidentified species of dace and sticklebacks were observed in a minnow trap at this location.

Water samples were collected at stations 1 and 2 for heavy metal analysis (Table 2). All heavy metal concentrations were very low or nondetectable at both sampling locations.

Field Work by: Brenda Sayles and William Taft
Aquatic Biologists

Report by: Brenda Sayles
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Figure 1. Sampling Station Locations for the Biological Survey
Conducted in the vicinity of Michigan Limestone -
Cedarville, Mackinac County, Michigan, August 2, 1988

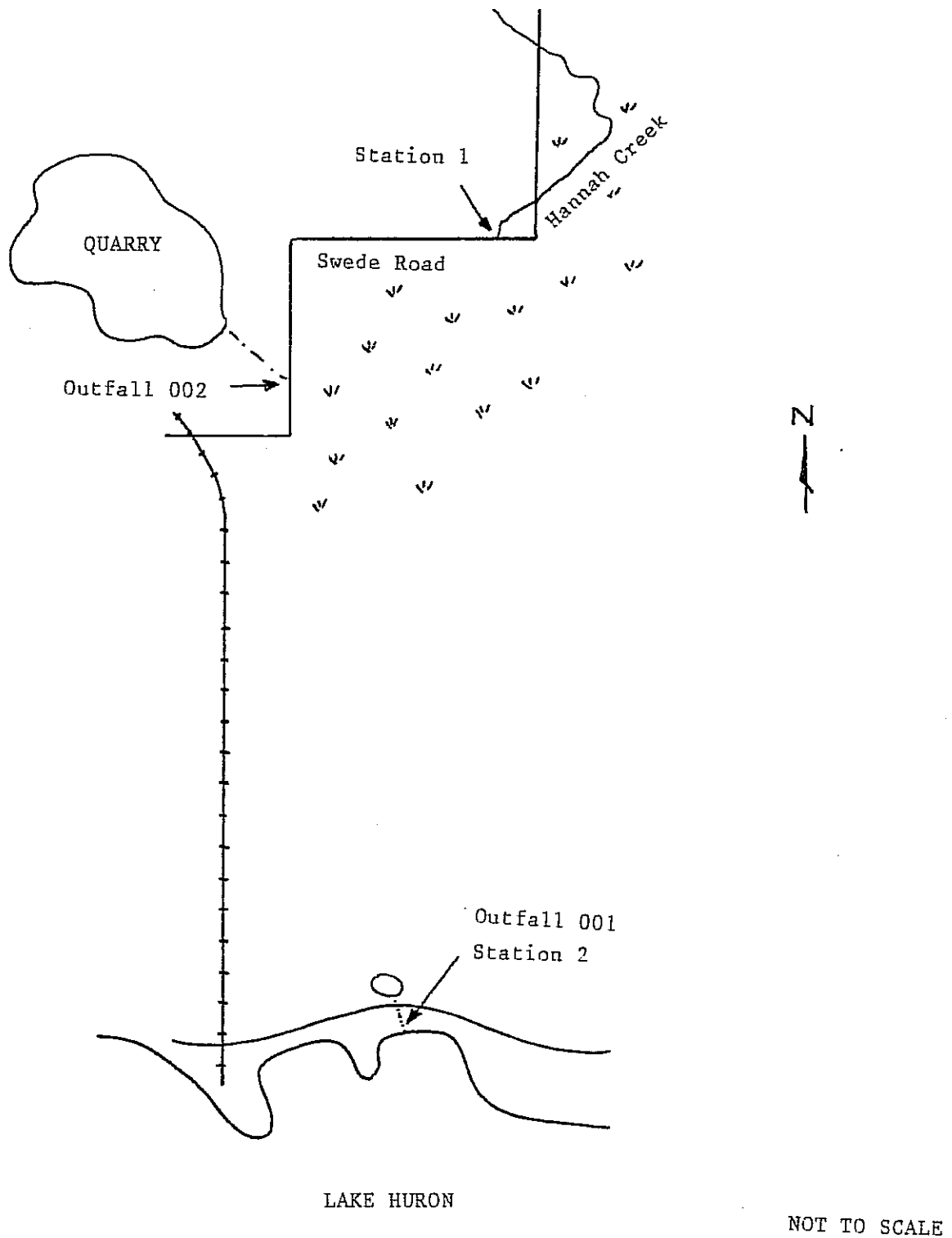


Table 1. Qualitative Macroinvertebrate Sampling Results for Hannah Creek, Mackinac County, Michigan, August 2, 1988

Station	1
Location	Swede Road
Taxa	

Hirudinea (leeches)	S
Gastropoda (snails)	
<u>Ferrissia</u> sp.	S
Pelecypoda (clams)	
Sphaeriidae	S
Isopoda (sowbugs)	M
Decapoda (crayfish)	M
Ephemeroptera (mayflies)	
Caenidae	S
Heptageniidae	M
Anisoptera (dragonflies)	S
Zygoptera (damselflies)	M
Megaloptera (alderflies)	
<u>Sialis</u> sp.	S
Trichoptera (caddisflies)	
Limnephilidae	S
Coleoptera (beetles)	
Elmidae (larvae)	S
Diptera (flies, midges)	
Chironomidae	S

Total No. of Taxa	13
Overall macroinvertebrate abundance	moderate
overall habitat quality	medium
S = sparse	
M = moderate	
A = abundant	

Table 2. Water Analysis Results of Hannah Creek and a Marsh Discharge to Lake Michigan in the vicinity of Michigan Limestone - Cedarville, Mackinac County, Michigan, August 2, 1988

Station	1	2
Location	Hannah Creek Swede Road	Marsh discharge to Lake Huron
Parameter		
Cadmium (ug/l)	< 0.2	< 0.2
Chromium (ug/l)	< 50	< 50
Copper (ug/l)	< 20	< 20
Lead (ug/l)	< 1	1.1
Mercury (ug/l)	< 0.5	< 0.5
Nickel (ug/l)	< 50	< 50
Selenium (ug/l)	< 1	1.6
Silver (ug/l)	< 0.5	< 0.5
Zinc (ug/l)	< 50	< 50
Suspended Solids (mg/l)	4	15
Total Dissolved Solids (mg/l)	420	300

MICHIGAN DNR
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STREAM SURVEY CARD

STORET NO.:

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STREAM:	Hannah Creek	SAMPLERS:	Sayles, Taft	DATE:	8/2/88
STATION:	1	LOCATION:	Swede Road	TIME:	9:34 AM
TYPE:	warmwater	LAND USE:	wet sedge meadow	REACH LENGTH(FT):	
WEATHER:	sunny	AIR TEMP(F):	78	WATER TEMP(F):	66
SHADING(%):	0	DAM U/S:	no	CHANNELIZED:	no

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VEGETATION:	<u>GRASS</u>	<u>HERBACEOUS</u>	<u>BRUSH</u>	<u>DECIDUOUS</u>	<u>CONIFER</u>
(%)	95		5		
(HEIGHT-FT)	4		6		

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DISCH. STABILITY:	moderately stable	BANK STABILITY:	stable	UNDERCUT BANKS:	yes
WIDTH(FT):	4	DEPTH(FT):	2	VELOCITY(FPS):	0.5
BANKFUL WIDTH(FT):	4	BANKFUL HGT.(FT):	3	EST DISCH(CFS):	4
CHANNEL SLOPE(%):		BANK SLOPE(%):			
CHANNEL SHAPE:	irregular	TURBIDITY:	none	WATER COLOR:	amber
WATER OILS:	none	WATER ODORS:	normal		
SED OILS:	none	SED ODORS:	normal	RUBBLE BLACK?	no

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SUBSTRATE:	<u>INORGANIC</u>	<u>(%)</u>	<u>IMBEDDEDNESS</u>	<u>ORGANIC</u>	<u>(%)</u>
	BOULDERS	5		MUCK-MUD	
	RUBBLE	5		PULPY PEAT	10
	GRAVEL	30		FIBROUS PEAT	40
	SAND	60		DETRITUS	50
	SILT			LOGS,LIMBS	
	CLAY				
TOTAL INORGANIC(%):		85	TOTAL ORGANIC(%):		15