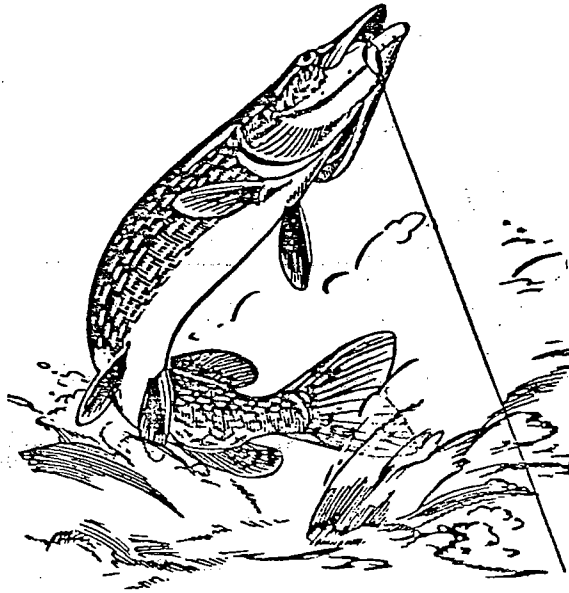


ELKHART RIVER SOUTH BRANCH  
FISHERY SURVEY  
1981



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# ELKHART RIVER SOUTH BRANCH FISHERY SURVEY

## Introduction

Most river systems in northeast Indiana contain native populations of northern pike (Esox lucius). However, little is known about local pike distribution and abundance within these rivers. Knowledge concerning specific habitat requirements of pike in these areas is also lacking.

The Indiana Department of Natural Resources initiated a northern pike management program in 1978 within the Elkhart River, South Branch Watershed. To date, the program has consisted of documenting pike distribution and abundance in several lakes within the watershed, evaluating pike migrations in various tributaries during the spring spawning season, monitoring wetland and stream alteration proposals, and informing the public of the management program. A major part of the pike management program has been the stocking of pike fingerlings at seven sites, including five sections of the South Branch mainstem and two upper watershed lakes (Bear and Miller Lakes).

In 1981, sampling was conducted along the South Branch mainstem to determine local distribution and abundance of pike in the river, to monitor pike stocking, to examine available pike habitat, and assess the current sport fishery. The following report is a summary of the findings.

## The Elkhart River South Branch

The Elkhart River South Branch drains a large portion of Noble County in northeast Indiana. Its headwaters begin at several natural lakes and flows to Port Mitchell Lake, located three miles southwest of Albion (Figure 1).

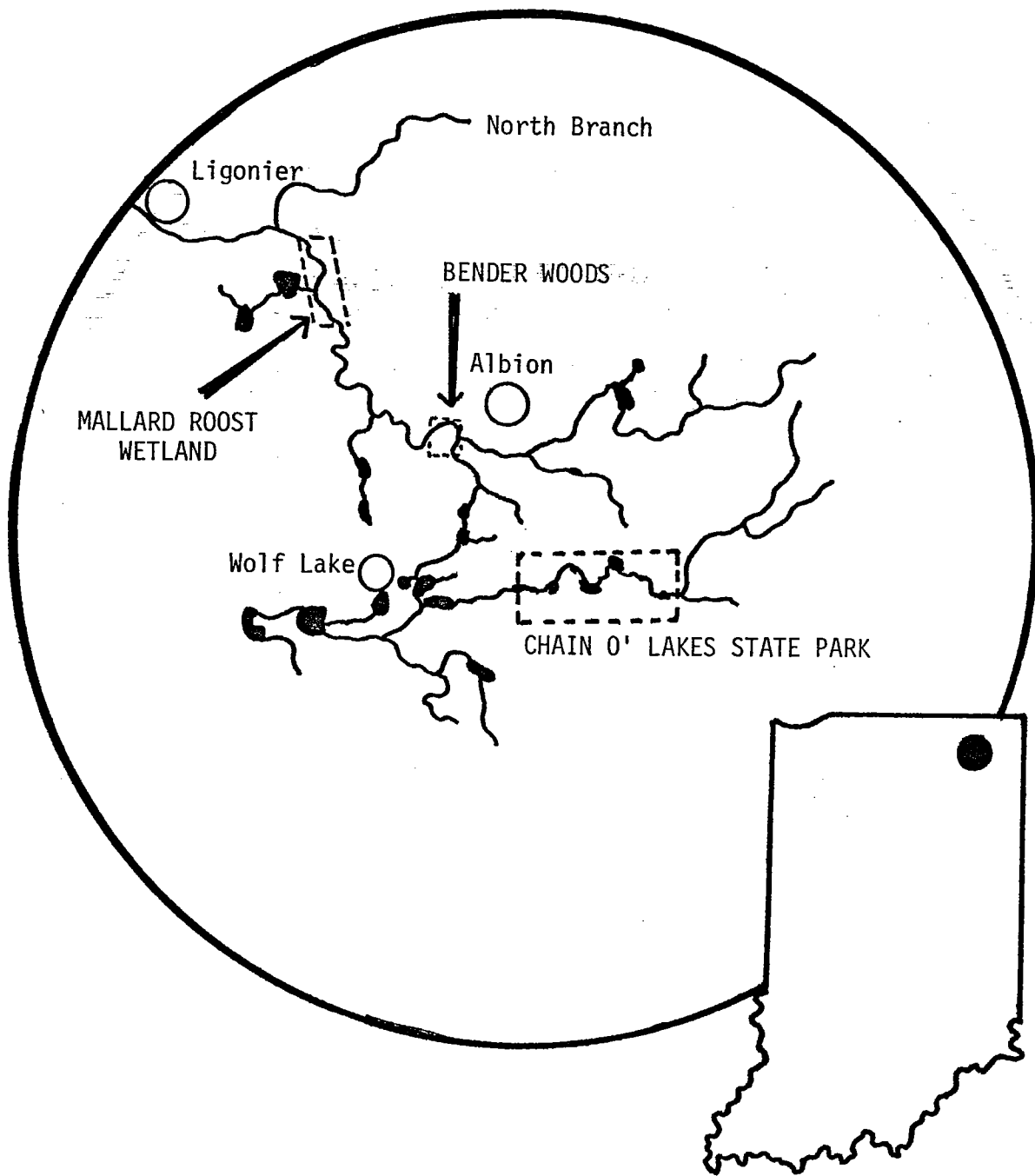
Upstream from Port Mitchell Lake, the river is a legal drain known locally as Thumma Ditch. Downstream from Port Mitchell Lake, the South Branch meanders in a northerly direction through woodlands (Benders Woods Nature Preserve) and through extensive wetlands (Mallard Roost Wetland Area). This section is currently under consideration for inclusion in Indiana's Natural Rivers Program.

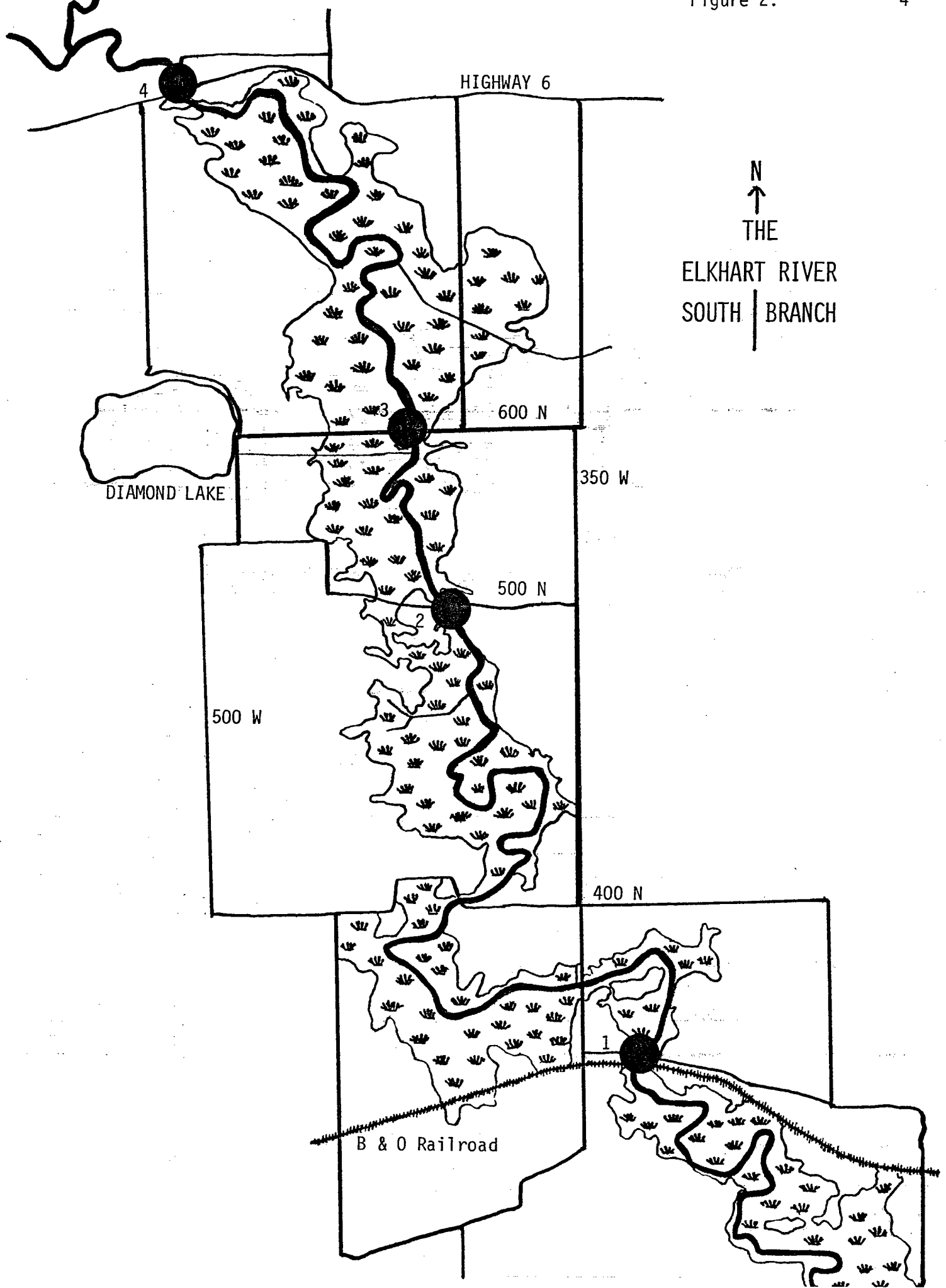
The terrain of the South Branch basin varies from flat farmland to rolling hills. Local relief approaches 100 feet in some places. The surrounding knobs are glacial till, composed of sand and gravel. However, the drop in elevation from Port Mitchell Lake to the North Branch confluence, a distance of about 16 river miles, is only 10 feet.

The South Branch joins the North Branch near Ligonier. From this point, the Elkhart River mainstem flows northwesterly to the St. Joseph River at Elkhart, which eventually empties into Lake Michigan.

Previous fishery work on the Elkhart River included a fishery survey in 1971. However, only two sites were sampled on the South Branch and sampling consisted only of electrofishing. On September 26, 1980, a total of 425 northern pike fingerlings were stocked at five locations along the South Branch. Two hundred pike were stocked within the Mallard Roost Area and 100 pike were stocked off the Albion Road bridge. At County Road 350 North and the Long Lake Road, 75 and 50 pike were stocked. The pike ranged from 6 to 14 inches long and averaged 8 inches long. The pike were marked with fin clips prior to release.

Figure 1. The Elkhart River, South Branch Watershed.





## Fish Sampling and Water Quality Analysis

Fish were collected at four sites along the South Branch July 6 to 10, 1981 (Figure 2). Public Access Sites are available at stations 2, 3, and 4. Access to station 1 was via a B & O Railroad right-of-way. Access along County Roads 350W and 400N is poor. The only other bridge crossing upstream from station 1 and downstream from Benders Woods is along the Long Lake Road. However, access is limited to small boats.

Sampling consisted of one electrofishing hour using AC gear during daylight, two trap nets set for 24 hours each, and one gill net set for 24 hours. All fish collected were identified, measured, and weighed.

Water temperature was recorded at each site, as well as pH, dissolved oxygen content, and alkalinity (Table 1). Stream size, bottom material, cover, and other comments concerning each site are presented in the Appendix.

Table 1. Water quality along the Elkhart River, South Branch, July 1981.

Station	Temperature( <sup>o</sup> F)	Oxygen(ppm)	pH	Alkalinity(ppm)
1	77	3.5	8.0	188
2	79	4.0	8.0	222
3	81.5	1.8	7.5	171
4	82	1.0	8.0	205

## Catch Composition

During the survey, 191 fish weighing 339 pounds were collected. Twenty-three species were represented. Carp dominated the catch by number (25%) and by weight (74%). Golden shiner, common shiner, and bowfin accounted for an additional 41% of the numerical catch and 20% of the poundage. Collectively, these four nongame species made up 66% of the catch by number and 94% by weight.

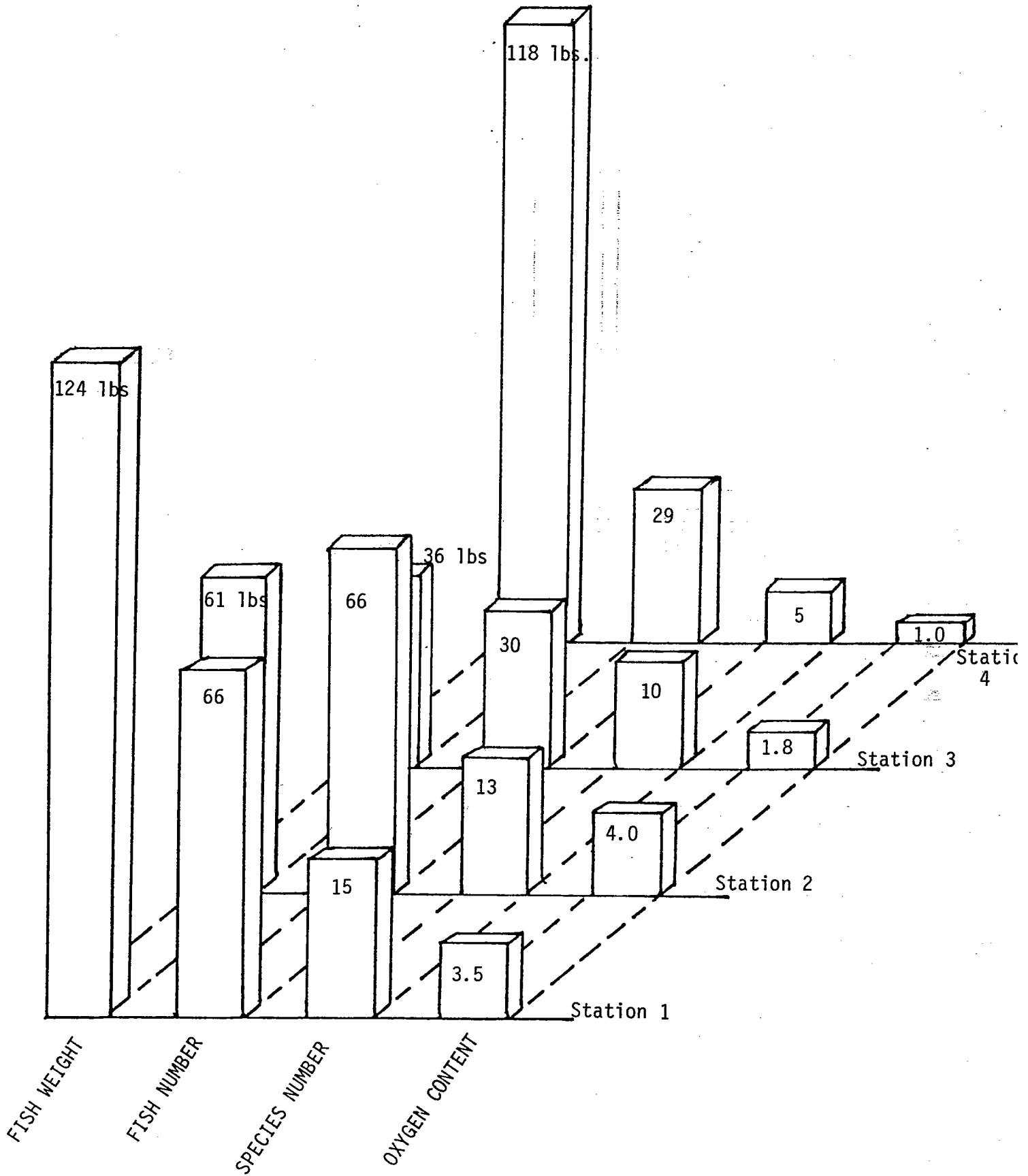
Major game species included yellow perch, black crappie, largemouth bass, and white crappie. However, each species made up less than 10% of the catch and less than 1% of the weight. Other minor game species were northern pike, smallmouth bass, redear, bluegill, and brown bullhead.

Unlike most other Indiana streams, suckers were extremely rare in the South Branch. Only one white sucker, spotted sucker, and northern hog-sucker were collected. Three lake chubsuckers were caught. The remaining nongame species included grass pickerel, bluntnose minnow, spotted gar, pirate perch, spotfin shiner, and topminnow.

The quality of the fishery declined with distance downstream from station 1 and was related to the oxygen content of the water (Figure 3). The maximum number of species, fish numbers, and weight were present at station 1. The only two pike collected in the river were captured here. The larger pike (22.1 inches long) was a stocked fish that had been released at the site. The smaller pike (4.9 inches long) was from natural pike reproduction.

At station 2, the number of fish remained constant but the number of species and weight dropped. Stations 3 and 4 had the poorest fishing quality. Dissolved oxygen content at these two sites was less than 2 ppm. Only 10 species were present at Station 3 and five species were present at station 4. Most of the fish collected at station 4 were carp, taken

Figure 3. Relationship between catch composition and oxygen content at four sites along the Elkhart River, South Branch, 1981.



in the area around the North Branch confluence. Only five bowfin were captured at station 4 upstream from the confluence.

There were substantial differences in the catches at stations 3 and 4 compared to the 1971 survey. In 1971, 18 species were collected at station 3, compared to 10 species in 1981. At station 4, 12 species were found in 1971 but only five in 1981. The 1971 catch at station 3 consisted of 233 fish weighing 56 pounds. By 1981, the catch dropped to 30 fish weighing 36 pounds. At station 4, 57 fish were taken in 1971 compared to 29 fish in 1981. However, the poundage collected at station 4 increased from 51 pounds in 1971 to 118 pounds in 1981. But most of the weight (111 pounds) consisted of 20 carp, compared to only 7 carp weighing 33 pounds in 1971.

#### Summary

The Elkhart River, South Branch supports an extremely poor quality fishery. The river provides virtually no sport-fishing opportunities. Even non-sport species such as carp, bowfin, and suckers are not abundant.

Water quality, especially in the Mallard Roost Wetland Area, is very poor. While the river "appears" cleaner after it passes through the Wetland, the organic load and oxygen demand are high. Consequently, oxygen content drops to levels not tolerated by most fish.

The exact causes of poor water quality are not known. However, several factors may be contributing to the low oxygen content in the South Branch:

1. decay of natural wetland vegetation.
2. lack of riffle areas in the river.
3. organic decay of municipal and agricultural effluents.
4. photosynthesis reduction by canopy shading and turbidity.

An investigation is needed to determine how each factor influences water quality in the river.

The 1980 fingerling northern pike stockings failed to improve the pike population in the river. The pike probably emigrated from the stocking sites because of low oxygen levels, despite the fact that northern pike can tolerate relatively low oxygen levels. Lack of suitable cover and adequate forage may also have caused pike to move. Apparently, the only area in the mainstem where some pike habitat exists is upstream from the Mallard Roost Wetland Area. No further pike stockings should be made in the river.

The Elkhart River, South Branch corridor has aesthetic and outdoor recreational values (boating, photography, etc.). However, justifying preservation of the river's existing natural character to maintain fishing and water quality is inappropriate. This information should be presented to the Indiana Division of Outdoor Recreation.

Submitted by: Jed Pearson, Fisheries Biologist  
Date: 12/10/81

Approved by: Gary Hudson  
Gary Hudson, Fisheries Supervisor

Approved by: William D. James  
William D. James, Chief of Fisheries  
Date: 12/18/81

NAME, NUMBER, PERCENTAGE, SIZE, AND WEIGHT OF FISHES  
COLLECTED FROM THE ELKHART RIVER, SOUTH BRANCH

COMMON NAME	SCIENTIFIC NAME	NUMBER	%	SIZE RANGE (INCHES)	TOTAL WEIGHT (POUNDS)	%	OCCURRENCE INDEX
Carp	<i>Cyprinus carpio</i>	47	24.6	11.5-28.1	250.80	74.1	4
Golden shiner	<i>Notemigonus crysoleucas</i>	31	16.2	3.3-6.6	.85	0.3	3
Common shiner	<i>Notropis cornutus</i>	26	13.6	2.0-6.0	.76	0.2	3
Bowfin	<i>Amia calva</i>	24	12.6	5.8-27.4	65.54	19.4	4
Yellow perch	<i>Perca flavescens</i>	15	7.9	4.0-5.9	.87	0.3	3
Black crappie	<i>Pomoxis nigromaculatus</i>	9	4.7	5.8-7.2	1.29	0.4	3
Largemouth bass	<i>Micropterus salmoides</i>	8	4.2	5.5-11.6	2.34	0.7	2
White crappie	<i>Pomoxis annularis</i>	7	3.7	1.3-7.4	.84	0.2	2
Grass pickerel	<i>Esox americanus</i>	4	2.1	4.4-8.2	.36	0.1	2
Lake chubsucker	<i>Erimyzon sucetta</i>	3	1.6	3.6-6.0	.25	0.1	2
Bluntnose minnow	<i>Pimephales notatus</i>	3	1.6	2.1-3.0	.03	-	2
Spotted gar	<i>Lepisosteus oculatus</i>	2	1.0	14.5-28.5	6.91	2.0	2
Northern pike	<i>Esox lucius</i>	2	1.0	4.9-22.1	2.30	0.7	1
White sucker	<i>Catostomus commersoni</i>	1	0.5	15.2	1.59	0.5	1
Spotted sucker	<i>Minytrema melanops</i>	1	0.5	14.5	1.44	0.4	1
Northern hogsucker	<i>Hypentelium nigricans</i>	1	0.5	13.0	.92	0.3	1
Smallmouth bass	<i>Micropterus dolomieu</i>	1	0.5	11.5	.85	0.3	1
Redear	<i>Lepomis microlophus</i>	1	0.5	7.7	.35	0.1	1
Brown bullhead	<i>Ictalurus nebulosus</i>	1	0.5	7.0	.19	0.1	1
Bluegill	<i>Lepomis macrochirus</i>	1	0.5	4.4	.07	-	1
Pirate perch	<i>Aphredoderus sayanus</i>	1	0.5	3.3	.04	-	1
Spotfin shiner	<i>Notropis spilopterus</i>	1	0.5	3.0	.01	-	1
Topminnow	<i>Fundulus spp.</i>	1	0.5	1.9	-	-	1
23 species	Total	191			338.60		