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REPORT ON FISH POPULATION AND ENVIRONMENTAL CONDITIONS IN PADDYS RN AND THE GREAT MIAMI RIVER IN THE VICINITY OF THE FERNALD PLANT OF THE A.E.C. JULY 28, 1952

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ON

FISH POPULATION AND ENVIRONMENTAL CONDITIONS

IN PADDYS RUN AND THE GREAT MIAMI RIVER IN THE

VICINITY OF THE FERNALD PLANT OF THE A. E. C.

BY

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JULY 28, 1952

FOREWORD

Early in May 1951 Mr. Daniel L. Lynch of the U. S. Atomic Energy Commission contacted the Biology Section of the Environmental Health Center, Public Health Service, in regard to collecting fish from Paddys Run and the Great Miami River in the vicinity of the proposed Fernald Plant of the A.E.C. It was desired to secure these fish for background studies to determine natural radioactivity in the fish of the area previous to the operation of the Fernald Plant. It was agreed that the Biology Section could make these collections and the streams in question were examined early in May. It was found that Paddys Run dried up in its central portion and that the Great Miami River carried large amounts of organic wastes. In a letter dated May 17, 1951, to Mr. Lynch, it was suggested that some studies should be made of fish populations present in these streams prior to the operation of the plant. This was considered especially desirable for the Great Miami River because it carries a heavy pollution load which may increase in the future. Studies above the outfall from the Fernald plant prior to the operation of the plant would serve as a basis for detecting significant stream changes due to increased pollution entering the river upstream from the plant. In his letter of May 31, 1951, Mr. Merril Eisenbud indicated the desire of his organization to have these studies made by the Environmental Health Center, reimbursement to be made on the basis of a Form 1080 in the amount of $1500.00.

INTRODUCTION

A reconnaissance survey of environmental conditions and fish populations in Paddys Run and the Great Miami River were carried out during July, August, and early September, 1951. The aims of this investigation were as follows: to secure samples of the various species of fish present in the two streams for the determination of natural radioactivity or levels of radioactivity present in the local fish previous to the operation of the Fernald Plant; to secure some knowledge of environmental conditions in the streams prior to operation of the plant; and to learn something of the fish populations in these streams in the vicinity of the plant so that future marked changes in the composition of the population can be detected.

Description of Areas Studied and Procedures

Paddys Run

Three sections of Paddys Run, one above and two below the Fernald Plant area, were seined to gain a qualitative and quantitative measure of the fish population. The upper section is the bend of the stream lying between the highways in sections 30 and 31 T.3.N., R.2.E. Fish collection No. 1 was made in this area. This portion of the stream is fairly typical of a small warm water meadow stream. Riffle areas are short, shallow, and rather flat while the pools are wide and long with depths usually not exceeding two feet. The riffles are largely of fine gravel with a little rubble and the pools have clay or silt bottoms. The water in this area is turbid and warm.

Most of AEC Property

About one-fourth mile below the point where Paddys Run enters the north boundary of the project area, it entirely disappears and the stream bed is dry for a distance of over a mile. Just above and a short distance below the point where the railroad crosses the stream below the project area,

In AEC Property

All Weavers Property (Railway on AEC)

extensive springs enter the stream bed. They form a clear cold stream having the general appearance of a trout stream. Fish collection No. 2 was made in about a half mile portion of this stream section which lies in section 7, T.2.N., R.2.E. This section of stream is characterized by short gravel riffles, wide shallow runs, good pools, and clear cold water.

Fish collection No. 3 was taken from the lower half mile or more of stream between the lowest highway bridge and the junction of the stream with the Great Miami River which lies in section 18, T.2N., R.2.E. In this portion of the stream floods and erosion are much more severe. Even during periods of low flow the water is slightly turbid and it is considerably warmer than in the stream section just above. Flood and silting have rendered environmental conditions less favorable and the fish population is smaller. Fish collections in Paddys Run were made by means of tied twine seines of 1/4 to 3/8 inch square mesh. Seines used were a 10 and 25 foot straight seine and a 36 foot bag seine.

Fish were also collected from a farm pond located on the project. Because this pond is so near the installations it was judged that it might give some indications of surface runoff and ground seepage. The pond exceeds 6 feet in depth and has a good stock of bluegill and large mouth bass. Some of these were collected by means of a 56 foot bag seine.

Great Miami River

The Great Miami River, exclusive of its largest branch, the Whitewater, drains an area of some 3900 square miles. Because the Whitewater joins the Great Miami just above its junction with the Ohio River, the majority of this drainage area is above the Fernald Plant. The section of the Great Miami River from Dayton to Hamilton, Ohio, receives the major portion of the organic wastes

entering the river. According to McDill (1950) the total amount of wastes entering the main stream from Tipp City to below Hamilton, expressed as population equivalents are as follows: domestic sewage and industrial wastes, 635,780, paper industry, 387,000, other industries, 128,000. This gives a total population equivalent of 1,150,780. The total sewage load of the stream is considerably larger, however, as the above total does not include wastes from Springfield, Urbana, Troy, Piqua, Sidney, Greenville, Bellefontaine, and several other small towns. The City of Hamilton and its associated industries lead all other communities in the amount of waste discharged into the Great Miami River.

The river is, therefore, noticeably polluted in the vicinity of the outlet from the Fernald Plant. Because this pollution may increase due to expansion in industry and growth of population it is desirable to have some check on stream conditions above the Fernald Plant. This is essential if changes in the stream due to pollution added above the plant are to be distinguished and assessed in order to obtain a correct evaluation of changes actually produced by the Fernald plant.

Studies of the fish populations were made in three areas or stations on the Great Miami River, one above and two below the plant outlet. The upper station is located at and just below the bridge where bypass U. S. 50 crosses the river near Venice, Ohio, section 3, T.2.N, R.2.E. One downstream station is located below New Baltimore, sections 4 and 18, T.2.N., R.2.E., and the other just above Miamitown. All fish were collected by means of two bag seines, one being 36 feet long, and the other 160 feet long. The smaller seine was used to sample populations along the bank in shallow water while the large seine was used to sample the deep pools. It was set from a boat and pulled with

ropes. These seines had a mesh of 1/4 and 3/8 and 3/8 and 1/2 inches and a depth of 6 and 8 feet respectively. All seining was done during July and August which is the usual period of low flow. Stream flows at Hamilton, Ohio, during the month of August are listed in Table 1.

RESULTS

PADDYS RUN

Fish were collected from three sections of Paddys Run, one above and two below the Fernald Plant Area. The fish taken in each area are considered as one collection. Collection No. 1 was made on July 23, 1951, in the bend of the stream between the roads adjoining the Morris Farm in sections 30 and 31, T.3.N., R.2.E. Collection No. 2 was made on July 25, 1951, in section 7, T.2.N., R.2.E., and Collection No. 3 was made in section 18, T.2.N., R.2.E. The species of fish taken in each of these sections and their relative abundance are shown in Table 2. Green sunfish were taken in considerable numbers at Station 1. The long eared sunfish and hybrids between it and the green sunfish reached a size suitable for angling. They were taken in all pools and could provide some angling. In the middle section, Station 2, no fish of recreational importance were taken. Just below the entrance of the springs the stream had a fauna characteristic of a trout stream. Cottus, common suckers, blacknosed dace, and stonerollers were common to abundant. After travelling for a short distance the water began to warm up and other species appeared.

at Winton Rd

The lower portion of the stream, section 3, is subject to severe floods, the banks are eroded, silt and sand have collected in the pools, and conditions are less favorable for fish. The fish population was much smaller

than in the sections above, and no fishes of recreational importance were taken.

A collection was made in the farm pond which is on the west side of the project area near Paddys Run, on August 2, 1951, and only two species of fish were taken, bluegills and largemouthed bass. These were fairly abundant and in fine condition. The largemouthed bass are evidently of good size as several weighing two to three pounds were caught and released. A few fish were preserved for radiological studies.

GREAT MIAMI RIVER

Several seine hauls were made at the various stations on the Great Miami River. At Station 1, located just below the Venice Bridge, section 3, T.2.N., R.2.E., five hauls were made with the 160 foot seine. The number and weight of fish taken in each of these hauls are summarized in Table 3. A total of 228 fish, weighing 62.5 pounds, were taken. This was an average catch per haul of 45.6 fish, weighing 12.5 pounds.

The smaller fishes which are usually found in the shallow water were sampled by means of a 36 foot bag seine. Six hauls each 100 feet long were made at station 1 with the seine. This collection of fishes has been designated as Collection IA. The numbers and size of the different species taken in this collection are summarized in Table 4.

At station 2 which is just below New Baltimore, three collections were made. Five hauls were made with the 160 foot seine. The fishes taken in these hauls have been designated as Collection No. 3. Two collections were made at this station with the 36 foot seine. The first one, designated as 3A, consisted of four 100 foot hauls, and the second, 3B, comprised five 100 foot hauls, made a short distance below 3A, in the vicinity of the B and O Railroad

Bridge. The species of fish taken in these two collections, their size, and number are summarized in Table 4. The number and weight of fishes taken in each of the seine hauls of collection No. 3 are tabulated in Table No. 5. The average catch per haul was 141 fish weighing almost 13 pounds.

Three fish collections were also made at station 3, which is just above Miamitown. Four hauls were made with the 160 foot seine. Fish taken in these hauls were designated as Collection No. 2. Collections 2A and 2B each consisted of six 100 foot hauls with the 36 foot bag seine. These hauls were made along the shallow side of the stream at and just below the area where the collection was made with the 160 foot seine. Species, size, and number of fishes taken in collections 2A and 2B are summarized in Table 4. Fish taken in each of the four seine hauls made for collection No. 2, are listed in Table 6. The average catch per haul was 35 fishes, weighing 11.3 lbs.

DISSOLVED OXYGEN STUDIES

Investigations made on other streams polluted with organic wastes have shown that there is a considerable diurnal variation in dissolved oxygen content and the pH of the stream water. In order to determine the extent of such variations at the three stations under study on the Great Miami River, a 24-hour sampling run was carried out on September 6-7, 1951. Samples were taken hourly at each of the three stations over a 24-hour period. The DO, pH, and air and water temperature at each station each hour are listed in Table 7. It will be noted that there is considerable diurnal variation in the dissolved oxygen and pH at each of the stations. It is probable that these variations were even greater during July and early August when the nights were warm. On warm nights when the temperature does not go below 75° F., it is probable that there is

very little dissolved oxygen at Station 1, between 4 and 6 o'clock in the morning. Hourly variations of dissolved oxygen at each station over the 24-hour period are shown graphically in Figure 1.

PLANKTON STUDIES

Hourly plankton samples were taken at each station at the same time the water samples were taken. Ten of the seventy two samples have been counted. Genera and average numbers of plankton organisms per ml taken at each of the stations at certain sampling hours are listed in Table 8.

DISCUSSION

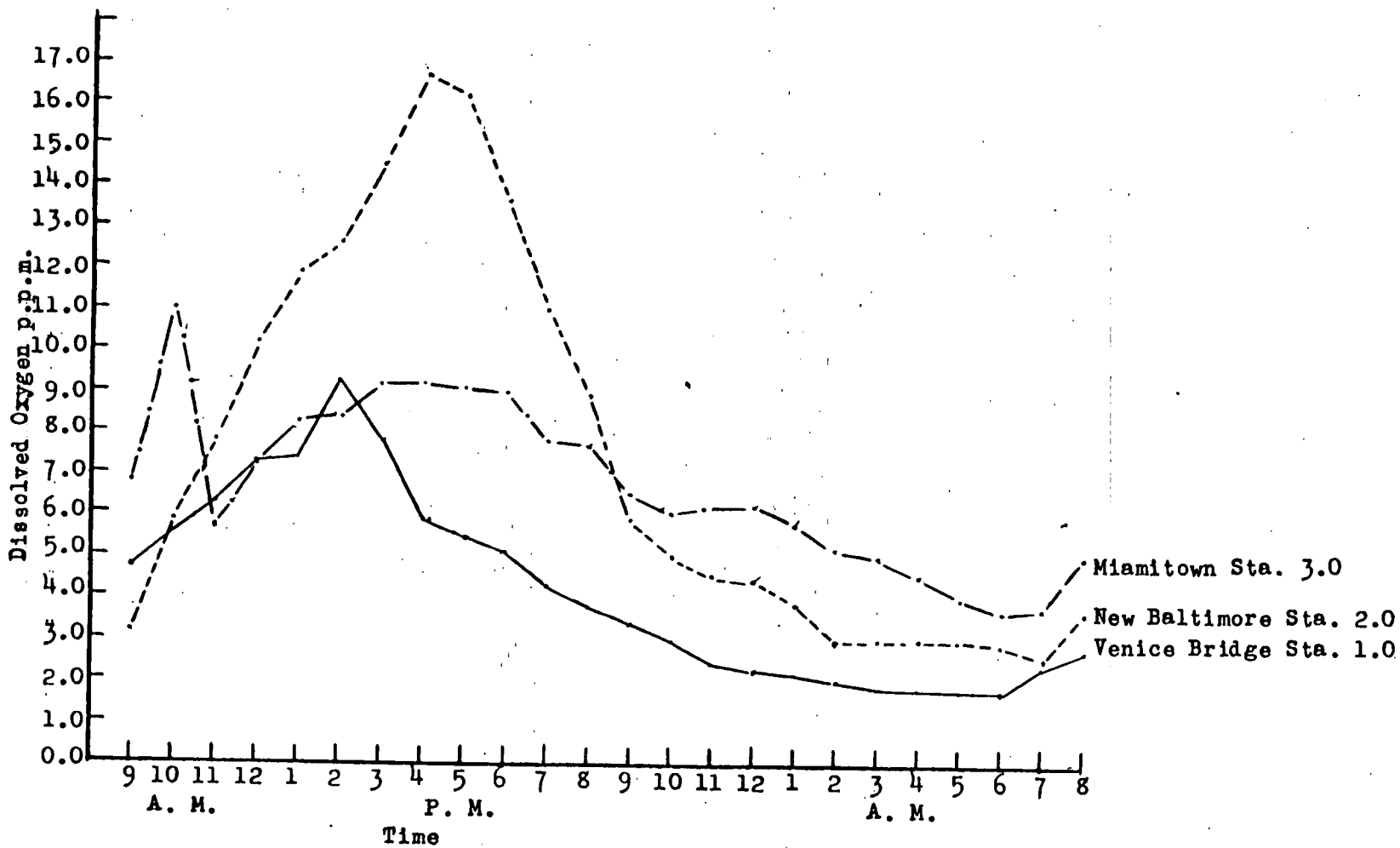
The studies in Paddys Run indicate that fish suitable for sport fishing are largely confined to the area of the stream above the Fernald Plant. Fishes below the plant while abundant are largely forage species.

Fish taken with the large seine in the Great Miami River are mainly coarse or rough fish which are tolerant of pollution. The relative abundance of the principal species in the catch at each station are shown in Table 9. Carp ranked first in weight at stations 1 and 2, while the common white sucker was first at station 3. These two species are outstandingly tolerant of organic pollution. The common white sucker ranked first in number at stations 1 and 3, while the gizzard shad was most abundant at station 2.

The catches with the small seine are not so indicative of pollutional conditions. As a group the minnows were dominant in the population, Notropis spilopterus being the most abundant species. More small mouthed bass were taken at station 1 than at any of the other stations. This is the reverse of what would be expected as the dissolved oxygen becomes very low in this area. It may be these fish were planted or they have moved down from Indian Creek which enters a short distance upstream. Also it is possible that flow from Indian Creek follows along the north bank of the stream where the bass were taken.

Figure 1

Range in Dissolved Oxygen Content
Great Miami River
September 6-7, 1951



As indicated in Table 4, on the basis of individual collections the number of species of fish taken in each section proceeding downstream was 14, 17, and 18. However, if all collections are considered, the greatest variety of species was taken at station 2, below New Baltimore, where 20 different species were collected. In general, the number of species in a polluted stream increases with distance from the source of pollution.

As indicated in Table 7, dissolved oxygen becomes very low at station 1 during the night. On a hot night during low flow it would probably virtually disappear at this station in mid channel. Diurnal variations in dissolved oxygen and pH indicate pollution and large algae populations which through photosynthesis cause a supersaturation of oxygen in the afternoon. The plankton studies reveal a very large population of algae in the water. As a whole the studies indicate a progressive self purification of the stream with distance below the Venice Bridge.

REFERENCES

McDill, Bruce M. 1950. Mobile Laboratory Survey of the Miami River Sewage and Industrial Wastes, Vol. 22, No. 11, pp 1464-1474.

TABLE 1

FLOWS IN THE GREAT MIAMI RIVER AT HAMILTON, OHIO, DURING AUGUST 1951

DATE	DISCHARGE IN CFS	DATE	DISCHARGE IN CFS
1	737	17	630
2	793	18	615
3	721	19	548
4	682	20	548
5	652	21	608
6	675	22	578
7	785	23	534
8	761	24	570
9	745	25	548
10	761	26	443
11	713	27	506
12	682	28	615
13	660	29	592
14	690	30	608
15	668	31	600
16	622		

TABLE 2

PADDYS RUN FISHES

SPECIES	COLLECTION No. 1	No. 2	No. 3
Catostomus c. commersonnii Common white sucker	C	A	C
Notropis cornutus chrysocephalus Common shiner	C	C	F
Notropis umbratilis cyanocephalus Northern red-finned shiner	C	F	F
Semotilus a. atromaculatus Horned dace or Northern creek chub	A	C	C
Campostoma a. anomalum Stone roller	A	A	C
Rhinichthys atratulus meleagris Western black-nosed dace	A	A	F
Pimephales promelas promelas Northern fat-headed minnow	C	C	-
Hybopsis notatus Blunt-nosed minnow	F	F	R
Notropis buccata Silver-jawed minnow	F	-	F
Chrosomus erythrogaster Red-bellied dace	F	C	F
Ameiurus natalis natalis Northern yellow bullhead	F	-	-
Boleosoma nigrum nigrum Central johnny darter	F	A	F
Poecilichthys s. spectabilis Northern orange throated darter	F	C	F
Etheostoma f. flabellaris Barred fan-tailed darter	F	A	-
Lepomis cyanellus Green sunfish	A	R	F
Lepomis megalotis megalotis Central long-eared sunfish	C	-	-
Micropterus d. dolomieu Small-mouthed bass	-	-	R
Cottus bairdii bairdii Mottler or millers thumb	R	A	F
TOTAL NUMBER OF SPECIES	17	14	14

A=Abundant
C=Common
F=Few
R=Rare

TABLE 3

Fishes Taken in Collection No. 1 in the Great Miami River at Station 1 Below Venice Bridge, August 3, 1951

SPECIES	SEINE HAULS 1			2			3			4			5			TOTAL		
	NO.	WT. Lb.	WT. Oz.	NO.	WT. Lb.	WT. Oz.	NO.	WT. Lb.	WT. Oz.	NO.	WT. Lb.	WT. Oz.	NO.	WT. Lb.	WT. Oz.	NO.	WT. Lb.	WT. Oz.
Catostomus c.commersonnii Common white sucker	37	6	12	23	4	8	17	3	10	16	2	4	32	6	8	125	23	10
Cyprinus carpio Carp	7	12	2	5	14	14	4	4	6				4	2	6	20	33	12
Dorosoma cepedianum Gizzard shad	9		4	44	1	2							25		12	78	2	2
Notemigonus crysoleucas auratus Golden shiner				1						1		2				2		2
Carpiodes cyprinus cyprinus Quillback carp sucker							2	2	10							2	2	10
Moxostoma erythrurum Golden redhorse sucker										1		4				1		4
TOTALS	53	19	2	73	20	8	23	10	10	18	2	10	62	9	10	228	62	8

2990

[illegible] 4

[illegible]cies, [illegible] in size and [illegible] of fishes taken with a 36 foot hag seine from shallow water along [illegible] length of shore at three stations in the [illegible] Miami [illegible]

	Station 1-Venice Bridge Coll. 1A 6-100 ft hauls Size-Inches	No.	Station 2-below New Baltimore Coll. 3A 4-100 ft hauls Size	No.	Coll. 3B 5-100 ft hauls Size	No.	Station 3-above Miamitown Coll. 2A 6-100 ft hauls Size	No.	Coll. 2B 6-100 ft hauls Size	No.
Dorosoma cepedianum Gizzard shad	3-1/2-4-1/2	8					2-3/4-4	42	3-1/2-5-1/2	98
Catostomus c. commersonnii Common white sucker	2-1/3-3	31	2-3	2	3	1	2-1/4-3-1/4	6		
Moxostoma erythrurum Golden redhorse sucker		54	1-3/4-2-1/4	3	2-1/2-3	3	2-4	6		
Hypentelium nigricans Hogsucker			2	4						
Quillback carp sucker					[illegible]	1	1-1/4-3	3	1-3/4-3-1/8	12
Cyprinus carpio Carp			1-1/4-2	23			2-1/4-4	79	1-1/8-3-1/2	14
Nocomis micropogon River Chub							3-3/4	1		
Notropis cornutus chrysocephalus Common shiner	1-1/2-3-1/2	217	1-1/2-2-1/4	22	1-3/4-2-3/4	46 6375	1-3/4	1	1-3/4-2-1/4	7
Notropis spilopterus Steel colored shiner	1-1/2-3-1/2	370	2-3-1/2	23	1-1/2-3-1/2	228	1-1/2-3	192	1-1/2-2-3/4	966
Notropis deliciosus Sand shiner	1-1/2	2			1-1/4-2-1/4		1-1/4-2-1/4	7	1-1/4-2-1/2	89
Notropis atherinoides Emerald shiner	1-1/4	2	2-1/2	2	2-3	27	1-3/4-2-3/4	11	1-1/2-2-7/8	65
Notropis blennius River shiner					2-1/4	1		1		
Notropis whipplii Satin-finned shiner							2-2-1/2	15		
Semotilus a. atromaculatus Creek chub	1-1/2-3-1/4	188	1-2	13	2-3	177	1-3/8-3-1/8	51	1-1/4-1-3/4	3
Pimephales p. promelas Fat headed minnow	1-1/2-2-1/2	93	1-2	76	1-1/2-2-1/2	12	1-1/4-2	68	1-1/4-2	134
Kricymba buccata Silver jawed minnow	1-1/2	1	1-1/2	1	1-3/4-2-1/4	4				
Hybophyschus notatus Blunt nosed minnow	1-1/2	1	1-3	66	1-1/2-2-1/4	6	1-1/2-2	10	1-1/4-2-1/2	40
Campostoma a. anomalum Stone roller minnow	1-1/2-4	266	1-1/2-2	2	1-1/2-3-1/8	24		1	1-1/2-2-3/4	22
Ameiurus m. melas Black bullhead	6	1	1-1/2	2						
Boleosoma n. nigrum Johnny darter			1-1/2	4						
Lepomis cyanellus Green sunfish			1-1/4-1-1/2	9				1	5/8	1
Micropterus d. dolomieu Small-mouthed bass	2-1/4-4	50	1-1/2-4-1/2	7	7	1	3-3-1/4	2		
TOTALS		1284		255		6706		497		1471

TABLE 5

Species, Number, and Weight of Fish Taken in Collection No. 3 at Station 2 just Below New Baltimore, Ohio, August 8, 1951

SPECIES	SEINE HAULS 1 NO.	1 WT. Lb.	1 WT. Oz.	2 NO.	2 WT. Lb.	2 WT. Oz.	3 NO.	3 WT. Lb.	3 WT. Oz.	4 NO.	4 WT. Lb.	4 WT. Oz.	5 NO.	5 WT. Lb.	5 WT. Oz.	TOTAL NO.	TOTAL WT. Lb.	TOTAL WT. Oz.
Dorosoma cepedianum Gizzard shad	15	1	8	36	1	7	479	12	8	29	3	8	35	2		594	20	15
Catostomus c. commersonnii Common white sucker	5		12	4		12	6	2		9	2	2	1		8	27	6	2
Carpiodes c. cyprinus Quillback carp sucker				1		12	2	2	8	2	1		4	2	4	9	6	8
Moxostoma erythrurum Golden redhorse sucker										1		10				1		10
Cyprinus carpio Carp				3	4	8	1	1	6	47	41	12	3	6	4	54	53	14
Hybognathus notatus Blunt nosed minnow	2															2		
Notemigonus crysoleucas auratus Golden shiner													1		2	1		2
Ameiurus n. melas Black bullhead				1		1	1		3	10	1	2				12	1	6
Boleosoma n. nigrum Johnny darter	1															1		
Lepomis cyanellus Green sunfish				4												4		
TOTALS	23	2	4	49	7	8	491	18	9	98	50	2	44	11	2	705	89	9

2990

TABLE 6

Species, Number, and Weight of Fish Taken in Collection No. 2 at Station 3 just above Hamilton, Ohio, August 7, 1951

SPECIES	SEINE HAULS 1 NO.	1 WT. Lb.	1 WT. Oz.	2 NO.	2 WT. Lb.	2 WT. Oz.	3 NO.	3 WT. Lb.	3 WT. Oz.	4 NO.	4 WT. Lb.	4 WT. Oz.	TOTAL NO.	TOTAL WT. Lb.	TOTAL WT. Oz.
Dorosoma cepedianum Gizzard shad	1		2	1						12		5	14		7
Catostomus c. commersonii Common white sucker	19	5	2	18	6		15	4	8	35	9		87	24	10
Moxostoma erythrurum Golden redhorse sucker							1		15				1		15
Carpiodes c. cyprinus Quillback carp sucker	8	14	9				2		2				10	14	11
Cyprinus carpio Carp				6	2	14	11	11	2				17	14	
Megastomatobus cyprinella Largemouthed buffalo							1	2	4				1	2	4
Nocomis micropogon River chub										1	2	2	1		2
Ameiurus m. melas Black bullhead							5		2	3		4	8		6
Ictalurus lacustris punctatus Channel cat							1	1	9				1	1	9
TOTALS	28	19	13	25	8	14	36	20	10	51	9	11	140	59	

0667

TABLE 8

Plankton Studies of the Big Miami River

Figures indicate organisms/ml - counted with Sedgwick-Rafter Slide

TABLE 7

Results of Hourly Sampling for a 24-Hour Period at Three Stations on the Great Miami River, Sept. 6-7, 1951

	VENICE BRIDGE				NEW BALTIMORE				MIAMITOWN			
			Temp.				Temp.				Temp.	
TIME	D.O.	pH	Air	Water	D.O.	pH	Air	Water	D.O.	pH	Air	Water
9:00 AM	4.7	7.4	73	75	3.2	7.6	75.2	72.5	6.0	8.4	74	77
10:00	5.6	7.5	74	75	5.9	7.8	76.1	74.3	11.0	8.0	74	77
11:00	6.3	7.5	75	76	7.8	8.0	76.1	77.0	5.7	7.8	74	77
12:00	7.3	7.7	78	77	10.2	8.2	78.8	78.8	7.2	8.0	76	78
1:00 PM	7.4	7.9	80	77	11.9	8.3	77.0	77.0	8.3	7.8	80	78
2:00	9.3	8.0	82	78	12.6	8.5	78.8	77.0	8.4	7.9	83	79
3:00	7.8	8.0	80	78	14.5	8.6	77.9	78.8	9.2	8.2	80	79
4:00	5.9	7.8	79	77	16.7	8.6	78.8	78.8	9.2	8.3	80	78
5:00	5.5	7.7	78	76	16.2	8.6	79.7	77.0	9.1	8.2	78	78
6:00	5.1	7.5	76	76	13.6	8.5	76.1	76.1	9.0	8.2	79	78
7:00	4.3	7.7	69	75	11.0	8.3	69.8	73.4	7.8	8.2	74	79
8:00	3.8	7.7	67	74	8.9	8.0	68.9	73.4	7.7	8.2	72	77
9:00	3.4	7.7	67	74	5.9	7.9	64.4	71.6	6.5	8.1	64	74
10:00	3.0	7.7	63	74	5.0	7.6	61.7	69.8	6.1	8.1	64	72
11:00	2.5	7.7	62	69	4.5	7.7	61.7	69.8	6.2	8.0	62	74
12:00	2.3	7.5	62	70	4.4	7.7	60.8	69.8	6.2	8.1	59	73
1:00 AM	2.2	7.5	60	70	3.9	7.7	59.0	68.0	5.8	8.0	57	72
2:00	2.0	7.4	58	69	3.0	7.7	59.0	68.0	5.2	8.0	56.5	73
3:00	1.9	7.5	58	70	3.0	7.6	58.1	68.0	5.0	8.0	56	73
4:00	1.9	7.5	56	70	3.0	7.7	55.4	68.0	4.5	8.0	54	70
5:00	1.8	7.5	55	70	3.0	7.7	53.6	68.0	4.0	7.9	53.5	71
6:00	1.8	7.6	55	69	2.9	7.7	53.6	68.0	3.7	7.9	54	69
7:00	2.4	7.5	58	70	2.6	7.7	58.1	68.0	3.8	7.9	54.5	70
8:00	2.8	7.5	64	69	3.7	7.7	64.4	69.8	5.0	7.9	59.5	71.5

TABLE 8

Plankton Studies of the Big Miami River

Figures indicate organisms/ml - counted with Sedgwick-Rafter Slide

ORGANISMS	STATION 1 VENICE Average	STATION 2 NEW BALTIMORE Average	STATION 3 MIAMITOWN Average
DIATOMS			
Cyclotella	345	126	222
Cymbella	3		
Fragilaria	93		42
Gomphonema	3		6
Melosira	78	36	72
Navicula	9		24
Nitzschia	288	36	216
Rhoicosphenia	3		
Stephanodiscus	18		42
Synedra	162	72	42
Tabellaria	6		
GREEN ALGAE			
Actinastrum	12		18
Arkistrodesmus	105	36	114
Arthrodesmus	3		
Chlorella	99	108	60
Chlorococcum	57	108	36
Chlorobotrys	6	54	
Closteriopsis	15	18	
Closterium	9		30
Coelastrum	24	18	12
Cosmarium	9		
Crucigenia		18	
Dictyosphaerium	36		30
Echinosphaerella	3		6
Elaktothrix	3		18
Gloeocystis			12
Kirchneriella	3		
Micractinium	75	18	12
Oocystis	36	18	42
Pediastrum	24		12
Selenastrum	15		
Schroederia	15		6
Sphaerella			30
Spirogyra	15		12
Sphaerocystis	9		
Stigeoclonium	3		
Tetradesmus	9		6
Westella	21		
Scenedesmus	762	360	639

TABLE 8 (Cont'd.)

ORGANISMS	STATION 1 VENICE Average	STATION 2 NEW BALTIMORE Average	STATION 3 WILMITOWN Average
BLUE-GREEN ALGAE			
Anabaena	15		
Aphanocapsa	3		
Chroococcus type	114	54	240
Holopedium	6		
Microcystis	3		
Oscillatoria type	30		13
PIGMENTED FLAGELLATES			
Chlamydomonas	69	36	120
Cryptoglena	3		
Euglena	90		
Phacus	15		
Trachelomonas	3		
UNPIGMENTED FORMS			
Protozoan cyst	9		6
Fungus-spore	9		
TOTALS	2745	1116	2115

Station 1 - Average for 6 samples
Station 2 - 1 Sample
Station 3 - Average for 3 samples

TABLE 9

Species composition of the catch made at each station with the 160 foot bag seine expressed as a percentage of the total number and weight

FISHES	PERCENTAGE OF THE TOTAL CATCH					
	STATION 1		STATION 2		STATION 3	
	No.	Wt.	No.	Wt.	No.	Wt.
Gizzard Shad	34.2	3.4	84.2	23.4	10.0	0.7
Common Sucker	54.8	37.8	3.8	6.8	62.1	41.7
Carp Sucker	0.9	4.2	1.3	7.2	7.1	24.8
Carp	8.3	54.0	7.6	60.2	12.1	23.7
Black Bullhead			1.7	1.5	5.7	0.6