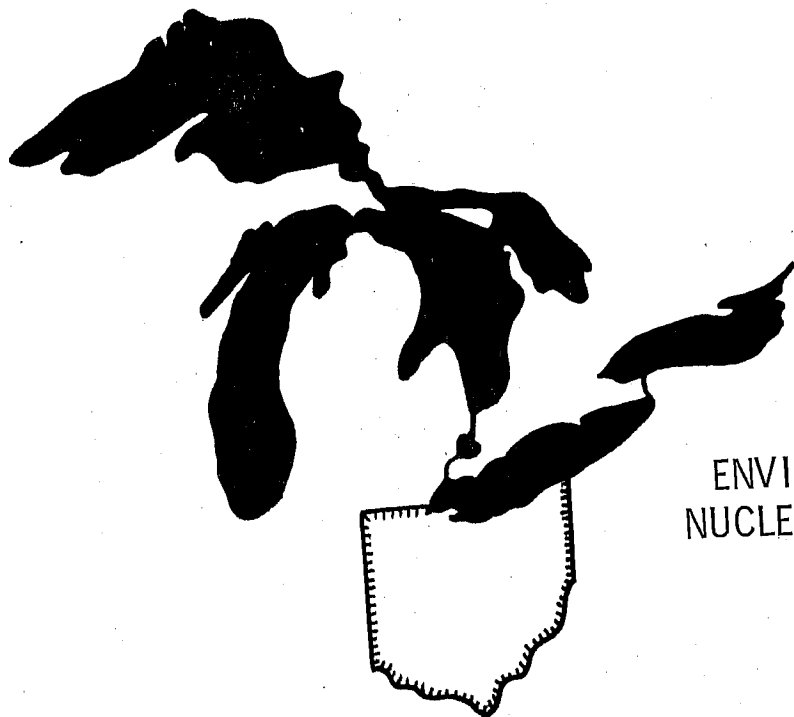




ENVIRONMENTAL EVALUATION OF A  
NUCLEAR POWER PLANT ON LAKE ERIE

ANNUAL REPORT - 1975  
STUDY I  
F-41-R-6

Prepared for

U. S. Fish and Wildlife Service  
and  
Ohio Department of Natural Resources  
Division of Wildlife

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COLUMBUS, OHIO

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ANNUAL PERFORMANCE REPORT

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Response of Fish and Invertebrates to  
the Heated Discharge from the Davis-  
Besse Reactor, Lake Erie, Ohio

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The Ohio State University  
Center for Lake Erie Area Research

ENVIRONMENTAL EVALUATION OF A NUCLEAR  
POWER PLANT ON LAKE ERIE  
Federal Aid Project F-41-R-6

Performance Report

State: Ohio Prepared by: Jeffrey M. Reutter  
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Date Prepared: 31 July 1975

Study Title: Response of Fish and Invertebrates to the Heated  
Discharge from the Davis-Besse Reactor, Lake  
Erie, Ohio

Period Covered: 1 June 1974 to 31 May 1975

ABSTRACT

The Toledo Edison Company and The Cleveland Electric Illuminating Company are currently building the Davis-Besse Nuclear Power Station on the south shore of Lake Erie near Locust Point. The first unit (906 MWe) of this station is scheduled to be operational in September 1976. Two additional units, each 906 MWe, have been proposed and are scheduled for completion in 1983 and 1985. This study is being carried out to characterize the lake's aquatic biota prior to the thermal discharge from Unit 1.

During 1974, fish, plankton, benthos and selected physical parameters were sampled from 25 stations within a 4000-ft. radius of the plant site. Where possible, comparisons have been made with 1972 and 1973 results. Seasonal trends have been developed. Benthic recolonization following the dredging of the intake and discharge pipelines appears to have been successful.

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## STUDY OBJECTIVE

The purpose of this investigation is to ascertain the existing character of the aquatic ecosystem at Locust Point, Lake Erie prior to operation of the Davis-Besse Nuclear Power Station, Unit 1. Included in the assessment are studies of existing plankton, benthos, and fish populations and water quality and recent trends in these parameters.

## PROCEDURES

### Sampling Station Location

Twenty-five stations, 18 along 4 transects in the open lake, 2 stations in the intake canal, 2 stations in the marshes, and 3 stations along the shoreline, were designated as sampling stations (Fig. 1). Of the 4 transects, one followed the intake conduit, one the discharge conduit, while control transects were set up on the east and west sides of the entire intake and discharge complex. Control west ran due north from the shore-end of the intake conduit with sampling stations located at 500 ft (Station 1), 1000 ft (Station 2), 2000 ft (Station 3), and 3000 ft (Station 4) from the shore line, sampling stations on the intake were located at 500 ft (Station 5), 1000 ft (Station 6), 2000 ft (Station 7), 3000 ft (Station 8, proposed intake), and 4000 ft (Station 9) from shore. Along the discharge transect sampling stations were at distances of 500 ft (Station 10), 1000 ft (Station 11), 1500 ft (Station 12, proposed discharge), 2000 ft (Station 13), and 3000 ft (Station 14) from shore. Additional stations were placed 500 ft due north of Station 12 (Station 15) and 500 ft south of Station 12 (Station 16). Control east ran perpendicular to the shoreline, parallel to the intake, and approximately 2500 ft east of the intake. Stations were located 500 ft (Station 17) and 1000 ft (Station 18) from shore. Station 19 was located in the center of the intake canal, 1000 ft from the lake shore. Station 20 was located in the center of the forebay, 2500 ft from shore. Stations 21 and 22 were located in the northwest and southeast marshes, respectively. Stations 23 - 25 were on the shoreline at the intersection of the intake conduit and 1500 ft to either side.

### Plankton

Plankton was sampled monthly, April through November, from 12 stations, 10 in the open lake and 2 in the intake canal and forebay (Table 1). Duplicate vertical tows, bottom to surface, were taken at each of the 12 stations with a Wisconsin plankton net (12 cm mouth;

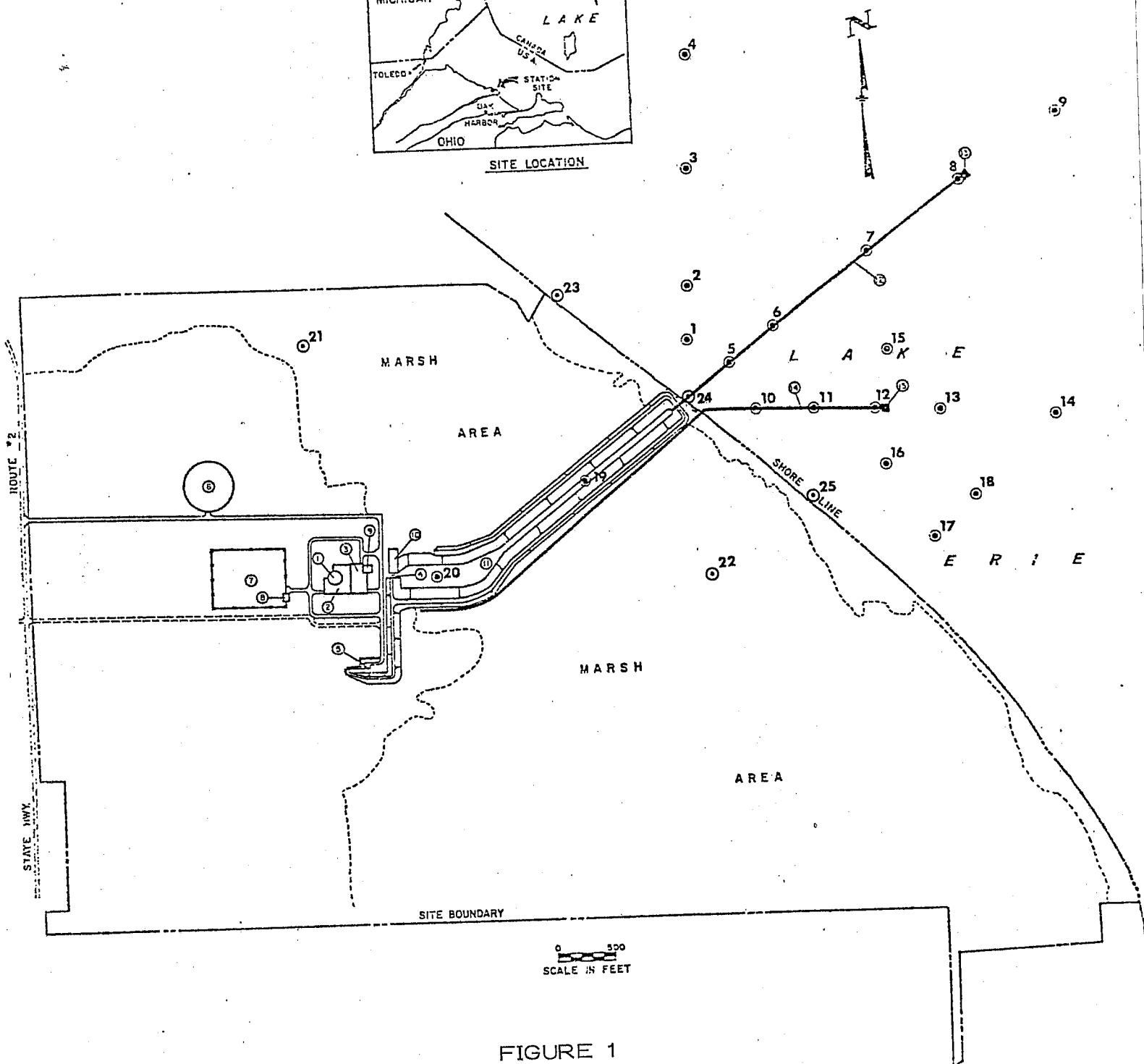
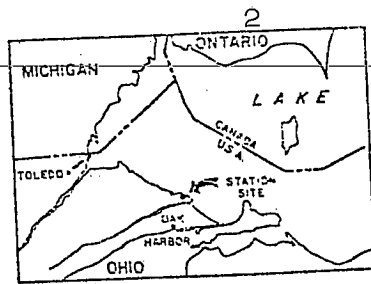


FIGURE 1

# LOCATION MAP OF SAMPLING STATIONS AT THE DAVIS-BESSE NUCLEAR POWER STATION

## LEGEND

### EXISTING BUILDING & STATION AREA

- ① CONTAINMENT BUILDING
- ② AUXILIARY BUILDING
- ③ TURBINE BUILDING
- ④ INTAKE STRUCTURE
- ⑤ SEWAGE TREATMENT PLANT
- ⑥ COOLING TOWER
- ⑦ SWITCH YARD
- ⑧ RELAY HOUSE
- ⑨ CIRCULATION WATER SYSTEM PUMP HOUSE
- ⑩ WATER TREATMENT BUILDING
- ⑪ FOREBAY & INTAKE CANAL

### PROPOSED WATER INTAKE AND DISCHARGE

- ⑫ 96" INTAKE CONDUIT
- ⑬ INTAKE CRIB
- ⑭ 72" DISCHARGE CONDUIT
- ⑮ DISCHARGE STRUCTURE

● Monitoring Stations

WATER INTAKE AND DISCHARGE  
DAVIS - BESSE NUCLEAR POWER STATION

no. 25, 0.064 mm mesh). Each sample was concentrated to 50 ml and preserved in 5% formalin. The volume of each sample was computed by multiplying the length of the tow by the area of the net mouth. The works of Chengalath, Fornando, and George (1971), Collins and Kalinsky (1972), Eddy and Hodson (1964), Jahoda (1948), Pennak (1953), Taft and Taft (1971), and Ward and Whipple (1959) were used in plankton identification.

TABLE 1

## AQUATIC MONITORING PROGRAM SAMPLING DATES-1974

| Sample          | Apr   | May   | Jun    | Jul   | Aug   | Sept  | Oct   | Nov   | Dec |
|-----------------|-------|-------|--------|-------|-------|-------|-------|-------|-----|
| PLANKTON        | 18    | 22    | 19     | 17    | 22    | 10    | 9     | 7     |     |
| BENTHOS         | 17-18 | 22-23 | 19-20  | 17    | 14    | 6     | 10    | 7     |     |
| FISH            |       |       |        |       |       |       |       |       |     |
| Gill Net        | 25-26 | 21-22 | 13-14  | 10-11 | 19-20 | 12-13 | 16-17 | 25-26 |     |
| Shore Seine     | 12    | 21    | 13     | 9     | 27    | 12    | 16    | 14    |     |
| Otter Trawl     |       |       |        |       |       |       |       |       |     |
| Lake            | 25    | 21    | 21     | 19    | 16    | 13    | 10    | 8     |     |
| Intake Canal    |       |       | 18     |       | 27    | 24    | 23    |       |     |
| Hoop Net        | 24-25 | 21-22 | 13-14  | 9-10  | 19-20 | 17-18 | 16-17 | 25-26 |     |
| Fry Net         |       |       |        |       |       |       |       |       |     |
| Lake            |       | 21    | 14     | 10    | 19    | 12    | 16    | 25    |     |
| Intake Canal    |       |       |        |       | 27    |       |       |       |     |
| WATER QUALITY   | 18    | 22    | 19     | 17    | 22    | 10    | 9     | 7     | 17  |
| CURRENTS        |       | 24    | 21     | 18    | 16    | 12    | 17    |       |     |
| SOLAR RADIATION | 25    |       | 1 & 29 | 26    |       | 7     | 31    |       |     |

Phytoplankton. Three 1-ml aliquots were withdrawn from each sample and placed in Sedgewick-Rafter cells. Twenty-five random Wipple Disk fields from each cell were counted for phytoplankton with a microscope at 100x. Identification was generally to the genus level. Results were reported as number per liter.

Zooplankton. Again, three 1-ml aliquots were withdrawn from each sample and placed in Sedgewick-Rafter cells. The entire cell was scanned under a microscope at 60x while counting and identifying all zooplankters. Individuals were identified as far as possible (generally to the genus or species level) and reported as number per liter.

## Benthos

Benthos was sampled monthly, April through November, from Stations 1 to 20 (Table 1). Three replicate samples were taken at each station with a Ponar grab ( $A = 0.055 \text{ m}^2$ ). Samples were sieved through a U.S. #40 sieve, preserved in 10% formalin and returned to the laboratory. Individuals were identified as far as possible (usually to genus; to species where possible) and reported as numbers of individuals per square meter. The works of Brinkhurst (1963), (1964), (1965), Brinkhurst, Hamilton, and Herrington (1968), Klemm (1972), Mason (1968), Pennak (1953), Stein (1962), Usinger (1956), Walter and Burch (1957), and Ward and Whipple (1959) were used for the benthos identification.

## Fish

Fish were sampled by 5 methods, gill nets, shore seine, otter trawl, hoop nets, and fry net, April through November (Table 1). All fish captured were weighed, measured, and identified to species (Trautman, 1957).

Gill nets. Two experimental gill nets were set parallel to and near the end of the intake and discharge pipelines (Stations 8 and 12, respectively). Each net (125 ft x 6 ft) consisted of five 25 ft x 6 ft contiguous panels (1/2", 3/4", 1", 1 1/2", and 2" bar mesh). The nets were fished for approximately 24 hours monthly.

Shore Seine. Shore seining was accomplished monthly with a 100 ft bag seine at Stations 23, 24, and 25. The seine was stretched perpendicular to the shoreline until the shore brail was at the water's edge. The far brail was then dragged through a 90° arc back to shore. Two hauls were made at each station.

Otter Trawl. Both a 16-ft and an 8-ft otter trawl were used to collect fish for estimates of relative abundance and to obtain live fish for stomach analysis. The 16-ft trawl was used in the open lake. Four 5-minute tows between the intake (Station 8) and the discharge (Station 12) were completed monthly.

The 8-ft trawl was used within the intake canal. Two tows of the entire canal length were conducted quarterly.

Hoop nets. Hoop nets (2.5 ft diameter, 1" bar mesh) were set at Stations 21 and 22 in the northwest and southeast marshes. The nets were fished for approximately 24 hours monthly. These fish were

identified, weighed, measured and released.

Fry Net. A 0.75-meter diameter oceanographic plankton net (no. 00, 0.75 mm mesh) was used to capture fry, larvae, and eggs (ichthyoplankton). Five-minute circular tows, surface and near bottom, around the intake (Station 8) and discharge (Station 12), were completed monthly. Additional tows, surface and bottom, were made within the intake canal in August. Ichthyoplankton was preserved in 5% formalin and analyzed under a dissecting microscope. Individuals were identified as far as possible (generally species) using the works of Fish (1932) and Norden (unpublished key to larval fishes).

#### Food Habits

Stomachs were taken from a representative number of fish collected in the monthly otter trawl. Each stomach was preserved in 5-10% formalin until its contents could be identified and enumerated in the laboratory.

#### Water Quality

Twenty water quality parameters were measured monthly during the entire period April - December at three stations in Lake Erie. These parameters and the analytical method employed are listed in Table 2.

Field Measurements. Water quality measurements were made monthly in the field at Station 1, 8, and 12 (Figure 1). Temperature, dissolved oxygen and conductivity were measured from a small survey boat with submerged sensors and shipboard readout meters. Dissolved oxygen was determined with a YSI model 54 meter and conductivity with a Beckman RB3-3341 solubridge temperature-compensated meter; each meter was equipped with a thermistor for temperature readings. Sensor readings were taken at the surface and approximately 50 cm above the bottom. Transparency was determined with a 30 cm diameter Secchi disk lowered on a marked line until it was no longer visible. Solar radiation was measured at Station 8 with a GM Mfg. and Instr. Corp. model 268WA-300 submarine photometer at the surface and at one-meter depth intervals until the illumination equalled 1.0% of the surface value. Current velocity and direction were measured at Stations 8 and 12 with a HydroProducts model 65-A meter and surface drogues.

Laboratory Determinations. Surface and bottom (50 cm above) water samples were taken at Stations 1, 8, and 12 with a 3-liter Kemmerer sampler at the same time that field measurements were being made. These samples were placed in polyethylene containers and taken to the laboratory for analysis; in most cases, analyses were completed within 24 hours of the sampling time. Fifteen water quality

TABLE 2

## ANALYTICAL METHODS FOR WATER QUALITY DETERMINATIONS

| Parameter                                    | Units           | Analytical Method                                 |
|----------------------------------------------|-----------------|---------------------------------------------------|
| 1. Temperature                               | °C              | Std. Methods, 13th Ed., 162 (1971)                |
| 2. Dissolved oxygen                          | ppm             | Std. Methods, 13th Ed., 218B (1971)               |
| 3. Conductivity                              | umhos/cm (25°C) | ASTM D1135-64 (1973)                              |
| 4. Transparency                              | meters          | Secchi disk (Welch, 1948)                         |
| 5. Solar radiation                           | u amps          | G.M. Mfg. & Instr. Corp.,<br>submarine photometer |
| 6. Current                                   | knots           | HydroProducts, A-65 current meter                 |
| 7. Calcium (Ca)                              | mg/l            | Std. Methods, 13th Ed., 110C (1971)               |
| 8. Magnesium (Mg)                            | mg/l            | Std. Methods, 13th Ed., 122B (1971)               |
| 9. Sodium (Na)                               | mg/l            | ASTM D1428-64 (1973)                              |
| 10. Chloride (Cl)                            | mg/l            | Std. Methods, 13th Ed., 112B (1971)               |
| 11. Nitrate (NO <sub>3</sub> )               | mg/l            | ASTM D992-71 (1973)                               |
| 12. Sulfate (SO <sub>4</sub> )               | mg/l            | ASTM D516-68C (1973)                              |
| 13. Phosphorous (Total as P)                 | mg/l            | Std. Methods, 13th Ed., 228F (1971)               |
| 14. Silica (SiO <sub>2</sub> )               | mg/l            | ASTM D 859-68B (1973)                             |
| 15. Alkalinity (total as CaCO <sub>3</sub> ) | mg/l            | Std. Methods, 13th Ed., 102 (1971)                |
| 16. Biochemical oxygen demand                | mg/l            | Std. Methods, 13th Ed., 219 (1971)                |
| 17. Suspended solids                         | mg/l            | Std. Methods, 13th Ed., 224C (1971)               |
| 18. Dissolved solids                         | mg/l            | USEPA, Chem. Analysis, Water (1971)               |
| 19. Turbidity                                | F.T.U.          | Std. Methods, 13th Ed., 163A (1971)               |
| 20. Hydrogen-ion conc.                       | pH units        | ASTM D1293-65 (1973)                              |

parameters (Table 2) were determined in the laboratory using the procedures prescribed in "Standard Methods for the Examination of Water, 13th Edition" (American Public Health Association, 1971) and in "ASTM Standards, Part 23, Water" (American Society for Testing and Materials, 1973).

## FINDINGS

### Plankton

Phytoplankton. Phytoplankters collected April through November 1974 were divided into 54 taxa, generally to the genus level (Table 3). Thirteen taxa were in the class Bacillariophyceae, 27 in the class Chlorophyceae, 1 in the class Chrysophyceae, 3 in the class Dinophyceae, 2 in the class Euglenophyceae, 6 in the class Myxophyceae, 1 consisted of unidentified bacteria, and 1 consisted of unidentified phytoplankters.

The range of the total phytoplankton population per liter per station was 5,510 - 13,288 in April; 5,753 - 240,929 in May; 361 - 4,205 in June; 56 - 6,855 in July; 410 - 2,274 in August; 1,385 - 9,543 in September; 11,757 - 38,151 in October; and 13,955 - 48,815 in November (Table 4).

Zooplankton. Zooplankters collected April through November 1974 were divided into 51 taxa, 27 under Rotifera, 8 under Copepoda, 9 under Cladocera, and 7 under Protozoa (Table 5). Twenty-four taxa were identified to the species level, 22 to the genus level, 2 consisted of unidentified rotifers, and 3 contained immature copepods.

The total zooplankton population per liter per station ranged from 40.5 - 152.0 in April; 38.4 - 1,270.1 in May; 83.6 - 1,495.9 in June; 246.7 - 2,202.2 in July; 224.8 - 431.3 in August; 213.1 - 1,018.3 in September; 92.3 - 394.0 in October; and 208.0 - 372.4 in November (Table 6).

### Benthos

Benthic macroinvertebrates collected at Locust Point April through November 1974 were divided into 40 taxa (Table 7). The population was dominated by Oligochaetes. The total benthic macroinvertebrate population per square meter per station ranged from 19 - 5,857 in April; 44 - 3,998 in May; 115 - 4,170 in June; 51 - 3,185 in July; 89 - 7,659 in August; 83 - 7,175 in September; 38 - 3,737 in October; and 0 - 4,291 in November (Table 8).

TABLE 3

# PHYTOPLANKTON POPULATIONS AT LOCUST POINT 1974 MONTHLY MEANS

| TAXA                                     | April<br>18 | May<br>22 | June<br>19 | July<br>17 | Aug<br>22 | Sept<br>10 | Oct<br>9 | Nov<br>7 |
|------------------------------------------|-------------|-----------|------------|------------|-----------|------------|----------|----------|
| <b>BACILLARIOPHYCEAE</b><br>(Diatoms)    |             |           |            |            |           |            |          |          |
| <i>Asterionella</i> sp.                  | 1735        | 1600      | 551        | 11         | 2         | 2          | 65       | 105      |
| Centric diatom                           |             |           |            | 10         |           | 0          | 49       | 53       |
| <i>Cyclotella</i> sp.                    | 4           |           |            | 2          |           | 43         | 0        | 0        |
| <i>Cymatopleura</i> sp.                  | 14          | 25        | 3          |            | 6         | 0          | 6        | 9        |
| <i>Fragilaria</i> sp.                    | 435         | 4556      | 63         |            | 21        | 38         | 368      | 2160     |
| <i>Gyrodinium</i> sp.                    | 1           |           |            | 2          | 6         | 6          | 5        | 10       |
| <i>Melosira</i> sp.                      | 3990        | 85597     | 350        | 238        | 719       | 754        | 3600     | 3398     |
| Naviculoid                               | 12          |           | 21         | 9          | 16        | 43         | 58       | 120      |
| <i>Stephanodiscus</i> sp.                |             |           |            | 1          |           | 0          | 1710     | 4780     |
| <i>Surirella</i> sp.                     |             | 12        | 19         | 4          |           | 0          | 1        | 7        |
| <i>Synedra</i> sp.                       | 5           | 23        |            | 2          |           | 20         | 23       | 39       |
| <i>Tabellaria</i> sp.                    | 1335        | 6259      | 81         | 6          | 2         | 1          | 18       | 66       |
| Unidentified Diatom                      |             |           |            |            |           |            | 55       |          |
| <b>CHLOROPHYCEAE</b><br>(Green Algae)    |             |           |            |            |           |            |          |          |
| <i>Actinastrum</i> sp.                   |             |           |            |            |           | 9          | 68       | 34       |
| <i>Ankistrodesmus</i> sp.                |             |           |            |            |           |            | 36       | 17       |
| <i>Binuclearia</i> sp.                   |             |           |            |            |           | 22         | 384      | 628      |
| <i>Chlamydomonas</i> sp.                 |             |           |            |            |           | 38         |          |          |
| <i>Closteriopsis</i> sp.                 | 43          | 11        |            | 2          | 25        | 0          | 185      | 832      |
| <i>Closterium</i> sp.                    |             |           |            |            |           | 245        | 10       | 23       |
| <i>Coelastrum</i> sp.                    |             | 3         |            | 62         |           | 56         | 32       | 21       |
| <i>Cosmarium</i> sp.                     |             |           |            | 4          |           | 4          | 5        | 11       |
| <i>Crucigenia</i> sp.                    |             |           |            |            |           |            | 24       |          |
| <i>Cruciginia</i> sp.                    |             |           |            |            |           | 4          |          |          |
| <i>Dictyosphaerium</i> sp.               |             |           |            |            |           | 6          | 111      | 124      |
| <i>Dimorphococcus</i> sp.                |             |           |            |            |           |            | 9        | 8        |
| <i>Eudorina</i> sp.                      |             |           |            | 61         | 107       | 19         | 3        | 0        |
| <i>Lagerheimia</i> sp.                   |             |           |            |            |           |            | 3        |          |
| <i>Micractinium</i> sp.                  | 2           |           |            |            |           | 0          | 55       | 36       |
| <i>Mougeotia</i> sp.                     | 6           |           |            |            | 2         | 935        | 4140     | 17776    |
| <i>Oocystis</i> sp.                      |             |           |            |            |           |            | 47       |          |
| <i>Pandorina</i> sp.                     | 2           | 12        | 27         | 26         |           | 64         | 47       | 39       |
| <i>Pediastrum</i> sp.                    | 37          | 392       | 841        | 774        | 557       | 1400       | 1982     | 1351     |
| <i>Platydorina</i> sp.                   |             |           |            |            |           | 6          |          |          |
| <i>Rhizoclonium</i> sp.                  |             |           |            | 3          |           |            | 2        | 0        |
| <i>Scenedesmus</i> sp.                   | 1           | 9         | 10         | 7          | 9         | 29         | 113      | 162      |
| <i>Selenastrum</i> sp.                   |             |           |            |            |           |            | 3        |          |
| <i>Spirogyra</i> sp.                     | 4           |           | 3          |            |           | 0          | 0        | 0        |
| <i>Staurostrum</i> sp.                   |             |           | 5          | 82         | 90        | 83         | 74       | 129      |
| <i>Ulothrix</i> sp.                      |             |           |            |            |           |            |          | 3        |
| <i>Volvox</i> sp.                        | 7           | 5         | 18         | 3          | 3         | 1          | 33       | 4        |
| <b>CHRYSTOPHYCEAE</b>                    |             |           |            |            |           |            |          |          |
| <i>Dinobryon</i> sp.                     |             |           |            |            |           |            | 3        |          |
| <b>DINOPHYCEAE</b><br>(Dinoflagellates)  |             |           |            |            |           |            |          |          |
| <i>Ceratium hirundinella</i>             | 3           | 14        | 6          | 1757       | 17        | 23         | 11       | 3        |
| <i>Glenodinium</i> sp.                   |             |           |            | 41         |           | 0          | 0        | 0        |
| <i>Peridinium</i> sp.                    |             |           |            |            |           | 14         |          |          |
| <b>EUGLENOPHYCEAE</b>                    |             |           |            |            |           |            |          |          |
| <i>Euglena</i> sp.                       |             |           |            |            |           | 8          | 23       | 26       |
| <i>Trachelomonas</i> sp.                 |             |           |            |            | 4         | 0          | 4        | 0        |
| <b>MYXOPHYCEAE</b><br>(Blue-green algae) |             |           |            |            |           |            |          |          |
| <i>Anabeana</i> sp.                      |             |           |            |            | 7         | 8          | 23       | 29       |
| <i>Aphanizomenon</i> sp.                 |             |           |            |            | 204       |            | 1547     | 5444     |
| <i>Chroococcus</i> sp.                   |             |           |            |            | 61        | 14         | 46       | 22       |
| <i>Merismopedia</i> sp.                  |             |           |            |            | 2         |            | 0        | 0        |
| <i>Microcystis</i> sp.                   |             |           |            | 99         | 39        | 13         | 265      | 307      |
| <i>Spirulina</i> sp.                     |             |           |            |            |           |            |          | 124      |
| Unidentified Bacteria                    | 182         |           |            |            |           |            | 0        | 6        |
| Unidentified Phytoplankton               |             |           |            |            | 26        |            | 0        | 0        |
| <b>TOTAL</b>                             | 7860        | 98517     | 2092       | 3460       | 1603      | 5751       | 19232    | 33499    |

Data presented as number/liter.

TABLE 4

## TOTAL PHYTOPLANKTON POPULATION PER LITER - 1974

| Station | April<br>18 | May<br>22 | June<br>19 | July<br>17 | August<br>22 | September<br>10 | October<br>9 | November<br>7 |
|---------|-------------|-----------|------------|------------|--------------|-----------------|--------------|---------------|
| 1       | 13282       | 12628     | 4205       | 6178       | 1393         | 7755            | 38151        | 35848         |
| 3       | 5929        | 78687     | 2047       | 2737       | 1329         | 3891            | 12016        | 33484         |
| 6       | 5510        | 84172     | 2276       | 3198       | 1680         | 5917            | 19424        | 27413         |
| 8       | 8250        | 100329    | 1593       | 2313       | 1562         | 5528            | 14883        | 43947         |
| 9       | 6227        | 57674     | 1657       | 1980       | 1727         | 4917            | 13456        | 48815         |
| 10      | 11758       | 240929    | 3357       | 6650       | 1977         | 9543            | 29853        | 35775         |
| 12      | 8097        | 118453    | 2335       | 6855       | 2274         | 6985            | 14540        | 32662         |
| 13      | 6657        | 103316    | 1892       | 2139       | 1679         | 6444            | 17977        | 26408         |
| 14      | 5904        | 76162     | 1314       | 3440       | 1353         | 4258            | 16030        | 33901         |
| 18      | 8510        | 91900     | 1976       | 2513       | 2252         | 6638            | 23463        | 36280         |
| 19      | 6333        | 5753      | 361        | 56         | 410          | 1385            | 11757        | 13955         |
| 20*     |             |           |            |            |              |                 |              |               |

\* This station had been drained of all water for further construction.

TABLE 5

# ZOOPLANKTON POPULATIONS AT LOCUST POINT 1974 MONTHLY MEANS

| TAXA                            | April<br>18 | May<br>22 | June<br>19 | July<br>17 | Aug<br>22 | Sept<br>10 | Oct<br>9 | Nov<br>7 |
|---------------------------------|-------------|-----------|------------|------------|-----------|------------|----------|----------|
| ROTIFERA                        |             |           |            |            |           |            |          |          |
| <i>Asplanchna giroidi</i>       | 0.3         |           |            |            |           |            |          |          |
| <i>A. priodonta</i>             | 0.0         | 2.2       | 1.8        | 2.6        | 57.3      | 29.8       | 3.1      | 2.2      |
| <i>Brachionus angularis</i>     | 9.0         | 3.7       | 8.8        | 25.4       | 46.4      | 3.1        | 2.2      | 1.1      |
| <i>B. calyciflorus</i>          | 3.7         | 5.2       |            | 0.3        | 0.1       | 1.6        | 9.5      | 27.4     |
| <i>B. havanaensis</i>           |             |           | 0.1        | 0.2        | 1.3       | 1.0        | 0.1      |          |
| <i>B. (Platylas) patulus</i>    |             |           |            |            |           | 0.2        |          |          |
| <i>B. urceolaris</i>            | 1.2         | 0.1       |            |            |           |            | 0.0      |          |
| <i>Chromogaster ovalis</i>      | 1.0         |           |            |            |           | 2.3        |          | 0.0      |
| <i>Conochiloides</i> sp.        |             |           | 34.9       | 7.3        | 0.3       | 0.2        | 5.8      | 2.5      |
| <i>Euchlanis</i> sp.            |             |           |            |            |           | 0.1        | 0.0      | 0.0      |
| <i>Filinia terminalis</i>       | 1.8         | 12.7      | 0.4        | 5.4        | 0.7       | 0.3        | 0.3      | 0.1      |
| <i>Hexarthra mira</i>           |             |           |            |            |           | 0.4        | 0.1      |          |
| <i>Kellicottia longispina</i>   | 0.6         | 4.6       | 3.2        |            |           |            |          | 0.1      |
| <i>Keratella cochlearis</i>     | 3.1         | 155.0     | 26.1       | 16.8       | 11.6      | 21.6       | 12.4     | 90.2     |
| <i>K. quadrata</i>              | 3.9         | 35.4      | 8.1        | 1.1        | 2.0       | 0.5        | 1.0      | 9.3      |
| <i>Lecane (Monostyla) bulla</i> |             |           |            |            |           |            | 0.0      |          |
| <i>L. (Monostyla) lunaris</i>   |             |           |            | 0.0        |           | 0.1        |          |          |
| <i>Notholca squamula</i>        | 6.5         | 13.1      |            |            |           |            | 0.3      |          |
| <i>Pleosoma</i> sp.             |             |           |            |            |           |            |          |          |
| <i>Polyarthra</i> sp.           | 5.8         | 73.1      | 128.5      | 512.8      | 106.5     | 215.0      | 37.1     | 33.1     |
| <i>Pompholyx sulcata</i>        |             |           |            |            |           | 1.1        |          |          |
| <i>Synchaeta</i> sp.            | 1.8         |           |            |            |           |            | 0.1      | 0.1      |
| <i>Testudinella</i> sp.         | 0.1         |           |            |            |           | 0.7        | 0.2      |          |
| <i>Trichocerca cylindrica</i>   |             | 0.0       |            | 0.4        |           | 0.7        | 0.2      |          |
| <i>T. multicrinis</i>           |             | 1.1       | 7.1        | 0.2        | 11.8      | 8.2        | 0.1      |          |
| Unidentified Rotifer A          | 0.1         | 1.8       |            |            | 2.7       | 39.1       | 0.3      | 27.5     |
| Unidentified Rotifer B          |             |           |            |            |           | 7.9        |          |          |
| COPEPODA                        |             |           |            |            |           |            |          |          |
| Calanoid copepods               |             |           |            |            |           |            |          |          |
| <i>Diaptomus</i> sp.            | 0.5         | 15.5      | 13.1       | 5.1        | 1.0       | 0.9        | 1.0      | 0.6      |
| <i>Eurytemora</i> sp.           |             |           |            |            |           |            |          | 0.0      |
| Immatures                       | 0.1         | 5.2       | 1.3        | 2.4        | 0.7       | 1.3        | 4.2      | 1.0      |
| Cyclopoid copepods              |             |           |            |            |           |            |          |          |
| <i>Cyclops</i> sp.              | 1.2         | 12.4      | 115.1      | 55.0       | 18.4      | 3.2        | 1.4      | 1.5      |
| <i>Mesocyclops</i> sp.          | 0.1         | 0.4       | 0.1        | 0.0        | 0.4       | 0.1        | 0.1      | 0.0      |
| <i>Tropocyclops prasinus</i>    |             |           |            |            |           |            |          | 0.1      |
| Immatures                       | 1.3         | 18.4      | 13.8       | 27.9       | 9.3       | 8.1        | 6.5      | 5.3      |
| Nauplius                        | 28.5        | 180.7     | 268.1      | 128.6      | 48.1      | 78.8       | 59.3     | 15.0     |
| CLADOCERA                       |             |           |            |            |           |            |          |          |
| <i>Bosmina</i> sp.              | 0.0         | 3.3       | 155.7      | 49.1       | 17.0      | 19.0       | 54.3     | 7.4      |
| <i>Ceriodaphnia</i> sp.         |             |           |            |            | 0.0       | 0.2        |          |          |
| <i>Chydorus</i> sp.             | 0.1         | 0.1       | 0.1        |            | 0.0       | 4.8        | 12.8     | 15.1     |
| <i>Daphnia galeata</i>          |             |           | 0.1        | 0.4        | 0.0       | 0.0        |          |          |
| <i>D. pulex</i>                 | 0.0         | 10.5      | 0.1        | 0.3        |           |            |          |          |
| <i>D. retrocurva</i>            |             |           | 74.5       | 137.8      | 2.8       | 2.2        | 0.1      |          |
| <i>Diaphanosoma</i> sp.         |             |           |            | 0.0        | 0.0       | 1.4        | 0.2      |          |
| <i>Holopedium</i> sp.           |             |           | 0.0        | 0.2        | 0.1       | 1.2        |          |          |
| <i>Leptodora kindtii</i>        |             |           | 0.1        | 0.2        | 0.1       | 0.2        |          |          |
| PROTOZOA                        |             |           |            |            |           |            |          |          |
| <i>Actineta</i> sp.             | 0.1         |           |            |            |           |            |          |          |
| <i>Amphileptus</i> sp.          | 0.1         |           |            |            |           |            |          |          |
| <i>Diffugia</i> sp.             |             |           |            | 69.6       | 26.9      | 99.3       | 42.2     | 15.8     |
| <i>Orphryodendron</i> sp.       | 0.1         |           |            |            |           |            |          |          |
| <i>Staurophrya</i> sp.          | 5.6         |           |            |            |           |            | 0.6      | 0.5      |
| <i>Vorticella</i> sp.           |             |           |            |            |           | 0.4        | 0.8      | 0.4      |
| <i>Zoothamnium</i> sp.          |             |           |            |            |           |            |          |          |
| TOTAL                           | 75.1        | 522.8     | 787.8      | 1131.8     | 364.5     | 556.3      | 259.2    | 256.0    |

Data presented as number/liter.

TABLE 6

## TOTAL ZOOPLANKTON POPULATION PER LITER - 1974

| Station | April<br>18 | May<br>22 | June<br>19 | July<br>17 | August<br>22 | September<br>10 | October<br>9 | November<br>7 |
|---------|-------------|-----------|------------|------------|--------------|-----------------|--------------|---------------|
| 1       | 152.0       | 598.8     | 83.6       | 1746.3     | 235.9        | 1018.3          | 394.0        | 265.7         |
| 3       | 53.5        | 414.5     | 639.7      | 1211.2     | 416.7        | 487.7           | 213.5        | 253.3         |
| 6       | 51.7        | 38.4      | 722.3      | 984.0      | 383.2        | 494.3           | 285.1        | 246.1         |
| * 8     | 55.6        | 265.0     | 732.5      | 917.6      | 424.2        | 361.1           | 256.2        | 256.2         |
| 9       | 44.7        | 269.5     | 721.8      | 992.3      | 431.0        | 343.7           | 228.3        | 372.4         |
| 10      | 144.8       | 1270.1    | 1495.9     | 2202.2     | 224.8        | 962.3           | 375.3        | 286.4         |
| 12      | 79.9        | 566.6     | 634.5      | 1027.6     | 387.5        | 694.4           | 209.9        | 234.2         |
| 13      | 62.5        | 453.9     | 829.0      | 1243.3     | 431.3        | 532.6           | 282.0        | 237.0         |
| 14      | 40.5        | 331.8     | 751.2      | 923.2      | 398.0        | 462.7           | 244.6        | 244.6         |
| 18      | 71.6        | 529.7     | 1067.7     | 954.9      | 319.8        | 549.5           | 270.1        | 208.0         |
| 19      | 69.4        | 1012.1    | 987.2      | 246.7      | 356.6        | 213.1           | 92.3         | 211.9         |
| 20*     |             |           |            |            |              |                 |              |               |

\* This station had been drained of all water.

TABLE 7

BENTHIC MACROINVERTEBRATE POPULATIONS  
AT LOGUST POINT - 1974 MONTHLY MEANS

| TAXA                        | April<br>17-18 | May<br>22-23 | June<br>19-20 | July<br>17 | Aug<br>14 | Sept<br>6 | Oct<br>10 | Nov<br>7 |
|-----------------------------|----------------|--------------|---------------|------------|-----------|-----------|-----------|----------|
| COELENTERATA                | 2              | 7            | 54            |            | 1         | 0         | 4         | 6        |
| Hydra sp. (budding polyp)   |                | 5            | 68            |            | 1         | 1         | 11        | 11       |
| Hydra sp. (single polyp)    |                |              |               |            |           | 3         | 4         |          |
| NEMATODEA                   |                |              |               |            |           |           |           |          |
| ANNELIDA                    |                |              |               |            |           |           |           |          |
| Hirudinea                   |                |              |               |            |           | 2         | 2         |          |
| Helobdella elongata         |                | 1            |               |            | 1         |           | 2         | 0        |
| H. stagnalis                |                |              |               | 21         |           |           |           |          |
| Oligochaeta (unidentified)  | 3              |              |               | 5          | 1         |           | 4         | 1        |
| Immatures (hair setae)      | 1168           | 1109         | 634           | 688        | 1071      | 941       | 870       | 750      |
| Immatures (no hair setae)   | 13             | 14           | 6             | 2          | 7         | 12        | 14        | 15       |
| Branchiura sowerbyi         |                | 4            | 3             | 7          | 39        | 21        | 3         | 10       |
| Limnodrilus cervix          |                | 10           | 33            | 15         | 22        | 11        | 4         | 6        |
| L. clapparedeanus           | 1              |              |               | 1          | 1         | 13        | 5         | 11       |
| L. clapparedeanus-cervix    |                | 1            |               |            |           |           |           |          |
| L. hoffmeisteri             | 0              | 3            |               | 0          | 1         | 1         |           | 1        |
| L. maumeensis               |                | 1            |               |            |           |           |           |          |
| L. udekemianus              | 2              | 10           |               |            |           |           | 1         | 5        |
| Nais sp.                    | 9              | 0            | 21            | 24         | 31        | 11        | 11        |          |
| Potamothrix moldaviensis    | 2              | 1            |               |            |           | 0         | 7         |          |
| P. vejovskyi                |                |              |               |            |           |           |           |          |
| Stylaria sp.                |                |              |               |            |           |           |           |          |
| ARTHROPODA                  |                |              |               |            |           |           |           |          |
| Cladocera                   |                |              | 16            | 136        | 40        | 186       | 14        | 0        |
| Leptodora kindtii           |                |              |               |            |           |           |           |          |
| Amphipoda                   | 3              | 0            | 9             | 13         | 6         | 10        | 22        | 36       |
| Gammarus fasciatus          |                |              |               | 1          |           |           |           |          |
| Hyalella azteca             |                |              |               |            |           |           |           |          |
| Decapoda                    |                |              | 0             |            |           |           |           |          |
| Orconectes sp.              |                |              |               |            |           |           |           |          |
| Chironomidae                |                |              |               |            |           |           |           |          |
| Chironomus (chironomus) sp. | 111            | 40           | 69            | 29         | 199       | 67        | 45        | 23       |
| Chironomus pupa             |                | 0            |               |            | 20        | 2         | 3         | 1        |
| Coelotanytus sp.            |                |              |               |            |           |           |           | 1        |
| Cricotopus sp.              | 4              | 6            | 3             | 3          | 8         | 2         | 13        | 17       |
| Cryptochironomus sp.        |                | 1            | 1             | 1          |           |           | 1         |          |
| Polypedilum sp.             | 23             | 18           | 32            | 6          | 57        | 8         | 12        | 31       |
| Procladius sp.              |                | 2            | 0             | 1          | 0         |           |           |          |
| Procladius pupa             | 0              | 1            | 0             |            |           | 1         |           |          |
| Pseudochironomus sp.        |                | 1            |               |            |           |           |           |          |
| Tanypodinae pupa            | 8              |              | 568           | 52         | 17        | 202       | 160       | 62       |
| Tanytarsus sp.              |                |              | 2             |            |           |           |           |          |
| Tanytarsus pupa             |                |              |               |            |           |           |           |          |
| Ephemeroptera               |                |              | 2             |            | 1         |           | 0         |          |
| Caenis sp.                  |                |              |               |            |           |           |           |          |
| Trichoptera                 | 0              |              |               |            |           |           |           |          |
| Hydropsychidae              |                |              |               |            |           |           |           |          |
| MOLLUSCA                    |                |              |               |            |           |           |           |          |
| Gastropoda                  | 0              | 0            | 0             |            |           |           |           |          |
| Bulimus sp.                 |                |              |               |            |           |           | 1         |          |
| Pelecypoda                  |                |              | 1             |            |           | 2         |           |          |
| Amblema plicata             |                | 3            | 1             | 3          | 2         |           | 2         | 1        |
| Sphaerium sp.               |                |              |               |            |           |           |           | 3        |
| Station Total               | 1355           | 1216         | 1528          | 954        | 1527      | 1543      | 1209      | 992      |

Data presented as number/m<sup>2</sup>.

TABLE 8

## TOTAL BENTHOS POPULATION PER SQUARE METER - 1974

| Station | April<br>17-18 | May<br>22-23 | June<br>19-20 | July<br>17 | August<br>14 | September<br>6 | October<br>10 | November<br>7 |
|---------|----------------|--------------|---------------|------------|--------------|----------------|---------------|---------------|
| 1       | 19             | 44           | 1700          | 127        | 592          | 83             | 579           | 210           |
| 2       | 96             | 516          | 147           | 76         | 102          | 274            | 528           | 210           |
| 3       | 1541           | 1662         | 4170          | 3185       | 2776         | 1191           | 2903          | 3247          |
| 4       | 3228           | 2375         | 2693          | 1910       | 2782         | 1738           | 3737          | 1745          |
| 5       | 312            | 140          | 115           | 127        | 127          | 115            | 1904          | 32            |
| 6       | 166            | 2941         | 191           | 204        | 7659         | 478            | 1413          | 548           |
| 7       | 3763           | 2413         | 433           | 267        | 624          | 834            | 471           | 255           |
| 8       | 3361           | 255          | 1585          | 458        | 535          | 1394           | 1445          | 751           |
| 9       | 898            | 1414         | 936           | 1770       | 1343         | 4564           | 1643          | 2095          |
| 10      | 57             | 57           | 191           | 51         | 185          | 127            | 185           | 38            |
| 11      | 382            | 382          | 3361          | 471        | 8152         | 439            | 102           | 586           |
| 12      | 1178           | 2808         | 802           | 458        | 102          | 643            | 560           | 1159          |
| 13      | 1293           | 465          | 337           | 987        | 89           | 1827           | 337           | 1490          |
| 14      | 5857           | 3998         | 3769          | 3018       | 3890         | 5004           | 3444          | 4291          |
| 15      | 357            | 89           | 1452          | 1464       | 1388         | 840            | 1700          | 745           |
| 16      | 401            | 134          | 1101          | 1292       | 1127         | 1821           | 802           | 255           |
| 17      | 57             | 3082         | 2840          | 337        | 102          | 210            | 331           | 83            |
| 18      | 3635           | 204          | 3056          | 1770       | 2184         | 7175           | 840           | 1108          |
| 19      | 325            | 618          | 146           | 153        | 261          | 567            | 38            | 0             |
| 20      | 178            | *            | *             | *          | *            | *              | *             | *             |

\* This station had been drained of all water for further construction.

## Fish

The five fishing methods employed yielded 31,405 fish of 34 species during the period April through November 1974. A summary of these results is contained in Tables 9 and 10.

Gill Net. Gill netting from April through November yielded 4,824 fish representing 21 species. The catch at Station 8 (intake) totaled 2,570 fish of 13 species, while at Station 12 (discharge) 2,554 fish of 18 species were captured (Tables 11 and 12).

Shore Seine. The yield from shore seines during the period April through November was 18,992 fish of 120 species. The monthly catches ranged from 259 - 13,150 fish (Tables 13 - 20).

Otter Trawl. Trawling in the lake during the period April through November yielded 1,460 fish of 14 species (Table 21). Scheduled trawling within the intake canal yielded 34 fish of 4 species during the summer and autumn quarters (Table 22). Twenty-two plus trawls, yielding 411 fish of 18 species, were made in September to remove as many fish as possible prior to poisoning<sup>1</sup> the canal (Table 23).

Hoop Net. Hoop nets set in the northwest marsh (Station 21) April through November yielded 57 fish of 5 species and 10 turtles (Table 24). Nets set in the southeast marsh (Station 22) during the same period caught 68 fish of 6 species, and 5 turtles (Table 25).

Fry Net. The catch during April through November from the lake totaled 5,524 fish of 8 species (Table 26). Fry netting within the intake canal on 27 August 1974, yielded 4 Notropis a. atherinoides (emerald shiner - mean length 77 mm) and 2 Morone chrysops (white bass - mean length 15 mm). These shiners are probably too large to be called fry. No sampling was done in the fall due to the poisoning of the canal in September.

## Food Habits

The stomach contents of 183 fish of 12 species collected April through November were analyzed (Table 27). Fifty-six percent of these stomachs contained food. The food items were identified as far as possible and placed into 23 taxa. Crustaceans were the most frequently observed food items.

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1. Poisoning of the intake canal took place on 25 September 1974 in order to remove fish from this area prior to plant operation. Continued monitoring of the canal will permit an assessment of fish movements, if any, through the intake crib.

TABLE 9

## SUMMARY OF FISHING RESULTS AT LOCUST POINT: APRIL - NOVEMBER 1974

| METHOD OF CAPTURE | APRIL       |                | MAY         |                | JUNE        |                | JULY        |                | AUGUST      |                | SEPTEMBER   |                | OCTOBER     |                | NOVEMBER    |                | TOTAL       |                |
|-------------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|
|                   | No. of Fish | No. of Species | No. of Fish | No. of Species | No. of Fish | No. of Species | No. of Fish | No. of Species | No. of Fish | No. of Species | No. of Fish | No. of Species | No. of Fish | No. of Species | No. of Fish | No. of Species | No. of Fish | No. of Species |
| Gill Net          | 177         | 7              | 3458        | 7              | 164         | 8              | 179         | 13             | 260         | 11             | 408         | 10             | 168         | 9              | 10          | 5              | 4824        | 21             |
| Shore Seine       | 491         | 9              | 259         | 9              | 298         | 6              | 13150       | 9              | 458         | 7              | 697         | 7              | 1555        | 4              | 2084        | 4              | 18992       | 20             |
| Otter Trawl       |             |                |             |                |             |                |             |                |             |                |             |                |             |                |             |                |             |                |
| Lake              | 24          | 5              | 27          | 5              | 134         | 5              | 18          | 8              | 88          | 9              | 64          | 10             | 67          | 3              | 1038        | 6              | 1460        | 14             |
| Intake Canal      |             |                |             |                | 31          | 5              |             |                | 33          | 4              | 411*        | 18             | 1           | 1              |             |                | 476         | 18             |
| Hoop Net          | 9           | 4              | 24          | 2              | 26          | 6              | 17          | 3              | 5           | 2              | 17          | 4              | 1           | 1              | 24          | 2              | 125         | 7              |
| Fry Net           |             |                | 242         | 2              | 726         | 3              | 4481        | 3              | 6           | 2              | 4           | 2              | 9           | 1              | 56          | 1              | 5524        | 8              |
| Lake              |             |                |             |                |             |                |             |                | 6           | 2              |             |                |             |                |             |                | 6           | 2              |
| Intake Canal      |             |                |             |                |             |                |             |                | 856         | 19             | 1601        | 24             | 1801        | 12             | 3212        | 11             | 31405       | 31             |
| TOTAL             | 701         | 16             | 4010        | 15             | 1379        | 17             | 17845       | 19             |             |                |             |                |             |                |             |                |             |                |

\* This was the total of more than 22 trawls made in an effort to remove as many fish (alive) as possible before poisoning the canal.

TABLE 10  
SPECIES FOUND IN THE LOCUST POINT AREA 1963 - 1974

| 1972 | 1973 | 1974 | Scientific Name                            | Common Name               |
|------|------|------|--------------------------------------------|---------------------------|
| *    |      | *    | Amiidae                                    |                           |
|      |      |      | <u>Amia calva</u>                          | bowfin                    |
|      |      | *    | Atherinidae                                |                           |
|      |      |      | <u>Labidesthes sicculus</u>                | brook silversides         |
|      |      |      | Catostomidae                               |                           |
|      | *    | *    | <u>Carpionodes cyprinus</u>                | quillback carpsucker      |
|      | *    | *    | <u>Catostomus c. commersoni</u>            | common white sucker       |
|      | *    | *    | <u>Minytrema melanops</u>                  | spotted sucker            |
| *    | *    |      | <u>Moxostoma erythrurum</u>                | golden redhorse           |
| *    |      |      | <u>Ictiobus cyprinellus</u>                | bigmouth buffalo fish     |
|      |      | *    | Centrarchidae                              |                           |
|      | *    | *    | <u>Ambloplites rupestris</u>               | northern rockbass         |
|      | *    | *    | <u>Lepomis cyanellus</u>                   | green sunfish             |
|      | *    | *    | <u>L. gibbosus</u>                         | pumpkinseed sunfish       |
|      | *    | *    | <u>L. humilis</u>                          | orangespotted sunfish     |
|      | *    | *    | <u>L. macrochirus</u>                      | northern bluegill sunfish |
|      | *    | *    | <u>L. microlophus</u>                      | redear sunfish            |
| *    | *    | *    | <u>Micropterus d. dolomieu</u>             | smallmouth bass           |
|      | *    | *    | <u>M. s. salmoides</u>                     | largemouth bass           |
|      | *    | *    | <u>Pomoxis annularis</u>                   | white crappie             |
| *    | *    | *    | <u>P. nigromaculatus</u>                   | black crappie             |
|      |      | *    | Clupeidae                                  |                           |
| *    | *    | *    | <u>Alosa pseudoharengus</u>                | alewife                   |
| *    | *    | *    | <u>Dorosoma cepedianum</u>                 | gizzard shad              |
|      |      | *    | Cyprinidae                                 |                           |
|      | *    | *    | <u>Carassius auratus</u>                   | goldfish                  |
|      | *    | *    | <u>C. auratus</u> x <u>Cyprinus carpio</u> | carp x goldfish hybrid    |
|      | *    | *    | <u>Cyprinus carpio</u>                     | carp                      |
|      | *    | *    | <u>Hybopsis storeriana</u>                 | silver chub               |
| *    | *    | *    | <u>Notropis a. atherinoides</u>            | emerald shiner            |
| *    | *    | *    | <u>N. hudsonius</u>                        | spottail shiner           |

TABLE 10 (CON'T.)  
SPECIES FOUND IN THE LOCUST POINT AREA 1963 - 1974

| 1972 | 1973 | 1974 | Scientific Name                 | Common Name           |
|------|------|------|---------------------------------|-----------------------|
|      | *    |      | <u>N. spilopterus</u>           | spotfin shiner        |
|      | *    |      | <u>N. v. volucellus</u>         | northern mimic shiner |
|      |      |      | Esocidae                        |                       |
|      |      |      | <u>Esox lucius</u>              | northern pike         |
|      |      |      | <u>Esox lucius</u>              | northern pike         |
|      |      |      | Ictaluridae                     |                       |
|      | *    | *    | <u>Ictalurus melas</u>          | black bullhead        |
| *    | *    | *    | <u>I. natalis</u>               | yellow bullhead       |
| *    | *    | *    | <u>I. nebulosus</u>             | brown bullhead        |
| *    | *    | *    | <u>I. punctatus</u>             | channel catfish       |
|      |      |      | <u>Noturus flavus</u>           | stonecat madtom       |
|      |      |      | Lepisosteidae                   |                       |
|      | *    |      | <u>Lepisosteus osseus</u>       | longnose gar          |
|      |      |      | Osmeridae                       |                       |
| *    | *    | *    | <u>Osmerus eperlanus mordax</u> | American smelt        |
|      |      |      | Percidae                        |                       |
|      | *    | *    | <u>Perca flavescens</u>         | yellow perch          |
|      | *    | *    | <u>Percina caprodes</u>         | logperch parter       |
| *    | *    | *    | <u>Stizostedion v. vitreum</u>  | walleye               |
|      |      |      | Percichthyidae                  |                       |
| *    | *    | *    | <u>Morone chrysops</u>          | white bass            |
|      |      |      | Percopsidae                     |                       |
|      | *    | *    | <u>Percopsis omiscomaycus</u>   | troutperch            |
|      |      |      | Petromyzontidae                 |                       |
|      |      | *    | <u>Petromyzon marinus</u>       | sea lamprey           |
|      |      |      | Salmonidae                      |                       |
| *    | *    | *    | <u>Oncorhynchus kisutch</u>     | coho salmon           |
|      |      |      | Sciaenidae                      |                       |
| *    | *    | *    | <u>Aplodinotus grunniens</u>    | freshwater drum       |

TABLE 11

ANALYSIS OF GILL NET CATCH AT LOCUST POINT,  
STATION 8 - APRIL - NOVEMBER, 1974

| Date              | Taxa                            | No.  | Length (mm) |         | Weight (g) |       |
|-------------------|---------------------------------|------|-------------|---------|------------|-------|
|                   |                                 |      | Mean        | Range   | Mean       | Total |
| April 25-26, 1974 |                                 |      |             |         |            |       |
|                   | <u>Aplodinotus grunniens</u>    | 3    | 259         | 228-304 | 198        | 593   |
|                   | <u>Cyprinus carpio</u>          | 1    | 666         |         | 4767       | 4767  |
|                   | <u>Morone chrysops</u>          | 1    | 322         |         | 481        | 481   |
|                   | <u>Notropis hudsonius</u>       | 4    | 116         | 113-120 | 15         | 61    |
|                   | <u>Perca flavescens</u>         | 8    | 195         | 165-304 | 123        | 983   |
|                   | Subtotal                        | 17   |             |         |            | 6885  |
| May 21-22, 1974   |                                 |      |             |         |            |       |
|                   | <u>Aplodinotus grunniens</u>    | 2    |             |         |            |       |
|                   | <u>Dorosoma cepedianum</u>      | 25   |             |         |            |       |
|                   | <u>Ictalurus punctatus</u>      | 2    |             |         |            |       |
|                   | <u>Morone chrysops</u>          | 10   |             |         |            |       |
|                   | <u>Notropis hudsonius</u>       | 2038 | 111         | 87-128  | 15         | 29964 |
|                   | Subtotal                        | 2077 |             |         |            | 29964 |
| June 13-14, 1974  |                                 |      |             |         |            |       |
|                   | <u>Alosa pseudoharengus</u>     | 26   | 173         | 152-204 | 44         | 1143  |
|                   | <u>Cyprinus carpio</u>          | 1    | 236         |         | 192        | 192   |
|                   | <u>Dorosoma cepedianum</u>      | 9    | 359         | 321-410 | 487        | 4383  |
|                   | <u>Notropis hudsonius</u>       | 25   | 117         | 102-127 | 16         | 400   |
|                   | <u>Osmerus eperianus mordax</u> | 1    | 171         |         | 29         | 29    |
|                   | <u>Perca flavescens</u>         | 17   | 176         | 153-207 | 71         | 1202  |
|                   | Subtotal                        | 79   |             |         |            | 7349  |
| July 10-11, 1974  |                                 |      |             |         |            |       |
|                   | <u>Alosa pseudoharengus</u>     | 4    | 184         | 173     | 58         | 232   |
|                   | <u>Ambloplites rupestris</u>    | 1    | 196         |         | 166        | 166   |
|                   | <u>Aplodinotus grunniens</u>    | 8    | 169         | 107-307 | 138        | 1104  |
|                   | <u>Catostomus c. commersoni</u> | 1    | 320         |         | 410        | 410   |
|                   | <u>Cyprinus carpio</u>          | 5    | 327         | 238-377 | 497        | 2485  |
|                   | <u>Ictalurus punctatus</u>      | 4    | 301         | 213-374 | 322        | 1288  |
|                   | <u>Morone chrysops</u>          | 1    | 333         |         | 588        | 588   |
|                   | <u>Notropis a. atherinoides</u> | 3    | 111         | 110-112 | 7          | 21    |
|                   | <u>N. hudsonius</u>             | 7    | 114         | 93-126  | 10         | 70    |
|                   | <u>Perca flavescens</u>         | 51   | 160         | 105-207 | 54         | 2754  |
|                   | Subtotal                        | 85   |             |         |            | 9118  |

TABLE 11 (CON'T.)

ANALYSIS OF GILL NET CATCH AT LOCUST POINT  
STATION 8 - APRIL - NOVEMBER, 1974

| Date                  | Taxa                            | No.  | Length (mm) |         | Weight (g) |       |
|-----------------------|---------------------------------|------|-------------|---------|------------|-------|
|                       |                                 |      | Mean        | Range   | Mean       | Total |
| August 19-20, 1974    |                                 |      |             |         |            |       |
|                       | <u>Aplodinotus grunniens</u>    | 1    | 250         |         | 170        | 170   |
|                       | <u>Carassius auratus</u>        | 2    | 243         | 240-245 | 215        | 430   |
|                       | <u>Cyprinus carpio</u>          | 5    | 287         | 230-333 | 373        | 1863  |
|                       | <u>Dorosoma cepedianum</u>      | 25   | 195         | 111-320 | 145        | 3624  |
|                       | <u>Ictalurus nebulosus</u>      | 2    | 151         | 137-165 | 55         | 110   |
|                       | <u>Morone chrysops</u>          | 1    | 223         |         | 175        | 175   |
|                       | <u>Notropis hudsonius</u>       | 2    | 103         | 102-105 | 10         | 21    |
|                       | <u>Perca flavescens</u>         | 56   | 174         | 95-207  | 75         | 4193  |
|                       | <u>Pomoxis annularis</u>        | 4    | 144         | 118-165 | 44         | 176   |
|                       | Subtotal                        | 98   |             |         |            | 10762 |
| September 12-13, 1974 |                                 |      |             |         |            |       |
|                       | <u>Alosa pseudoharengus</u>     | 72   | 103         | 93-184  | 12         | 864   |
|                       | <u>Dorosoma cepedianum</u>      | 14   | 153         | 91-341  | 81         | 1140  |
|                       | <u>Ictalurus nebulosus</u>      | 2    | 146         | 141-150 | 42         | 84    |
|                       | <u>Morone chrysops</u>          | 1    | 90          |         | 10         | 10    |
|                       | <u>Notropis hudsonius</u>       | 11   | 108         | 100-112 | 14         | 152   |
|                       | <u>Perca flavescens</u>         | 40   | 190         | 137-213 | 85         | 3414  |
|                       | <u>Pomoxis annularis</u>        | 5    | 177         | 155-215 | 85         | 426   |
|                       | <u>Stizostedion v. vitreum</u>  | 1    | 199         |         | 70         | 70    |
|                       | Subtotal                        | 146  |             |         |            | 6160  |
| October 16-17, 1974   |                                 |      |             |         |            |       |
|                       | <u>Alosa pseudoharengus</u>     | 27   | 99          | 93-111  | 9          | 247   |
|                       | <u>Dorosoma cepedianum</u>      | 2    | 146         | 135-156 | 34         | 67    |
|                       | <u>Notropis hudsonius</u>       | 19   | 113         | 104-128 | 15         | 287   |
|                       | <u>Osmerus eperianus mordax</u> | 1    | 159         |         | 21         | 21    |
|                       | <u>Perca flavescens</u>         | 14   | 181         | 147-211 | 75         | 1046  |
|                       | <u>Stizostedion v. vitreum</u>  | 1    | 220         |         | 107        | 107   |
|                       | Subtotal                        | 64   |             |         |            | 1775  |
| November 25-26, 1974  |                                 |      |             |         |            |       |
|                       | <u>Notropis hudsonius</u>       | 3    | 108         | 101-112 | 14         | 43    |
|                       | <u>Perca flavescens</u>         | 1    | 180         |         | 79         | 79    |
|                       | Subtotal                        | 4    |             |         |            | 122   |
| TOTAL                 |                                 | 2570 |             |         |            | 72135 |

TABLE 12.

ANALYSIS OF GILL NET CATCH AT LOCUST POINT,  
STATION 12 - APRIL - NOVEMBER, 1974

| Date              | Taxa                            | No.  | Length (mm) |         | Weight (g) |       |
|-------------------|---------------------------------|------|-------------|---------|------------|-------|
|                   |                                 |      | Mean        | Range   | Mean       | Total |
| April 25-26, 1974 |                                 |      |             |         |            |       |
|                   | <u>Minytrema melanops</u>       | 1    | 172         |         | 50         | 50    |
|                   | <u>Notropis hudsonius</u>       | 124  | 112         | 102-128 | 16         | 2015  |
|                   | <u>Perca flavescens</u>         | 34   | 170         | 130-215 | 54         | 1838  |
|                   | <u>Percopsis omiscomaycus</u>   | 1    | 106         |         | 12         | 12    |
|                   | Subtotal                        | 160  |             |         |            | 3915  |
| May 21-22, 1974   |                                 |      |             |         |            |       |
|                   | <u>Alosa pseudoharengus</u>     | 40   |             |         |            |       |
|                   | <u>Ictalurus punctatus</u>      | 1    |             |         | 13         | 17706 |
|                   | <u>Notropis hudsonius</u>       | 1331 | 108         | 88-123  |            |       |
|                   | <u>Perca flavescens</u>         | 9    |             |         |            | 17706 |
|                   | Subtotal                        | 1381 |             |         |            |       |
| June 13-14, 1974  |                                 |      |             |         |            |       |
|                   | <u>Alosa pseudoharengus</u>     | 43   | 172         | 155-214 | 43         | 1868  |
|                   | <u>Aplodinotus grunniens</u>    | 3    | 127         | 125-130 | 22         | 67    |
|                   | <u>Cyprinus carpio</u>          | 1    | 220         |         | 166        | 166   |
|                   | <u>Dorosoma cepedianum</u>      | 9    | 261         | 210-377 | 241        | 2166  |
|                   | <u>Ictalurus punctatus</u>      | 1    | 377         |         | 453        | 453   |
|                   | <u>Notropis hudsonius</u>       | 25   | 122         | 105-176 | 18         | 454   |
|                   | <u>Perca flavescens</u>         | 3    | 147         | 97-180  | 44         | 131   |
|                   | Subtotal                        | 85   |             |         |            | 5305  |
| July 10-11, 1974  |                                 |      |             |         |            |       |
|                   | <u>Alosa pseudoharengus</u>     | 72   | 172         | 142-207 | 47         | 3638  |
|                   | <u>Aplodinotus grunniens</u>    | 3    | 209         | 144-338 | 186        | 558   |
|                   | <u>Dorosoma cepedianum</u>      | 7    | 282         | 137-365 | 349        | 2443  |
|                   | <u>Hybopsis storeriana</u>      | 1    | 181         |         | 62         | 62    |
|                   | <u>Ictalurus punctatus</u>      | 2    | 241         | 196-285 | 148        | 296   |
|                   | <u>Notropis a. atherinoides</u> | 1    | 110         |         | 10         | 10    |
|                   | <u>N. hudsonius</u>             | 1    | 125         |         | 22         | 22    |
|                   | <u>Perca flavescens</u>         | 5    | 160         | 115-197 | 46         | 230   |
|                   | <u>Pomoxis annularis</u>        | 2    | 136         | 121-151 | 36         | 72    |
|                   | Subtotal                        | 94   |             |         |            | 7331  |

TABLE 12 (CON'T.)

ANALYSIS OF GILL NET CATCH AT LOCUST POINT,  
STATION 12 - APRIL - NOVEMBER, 1974

| Date                  | Taxa                            | No. | Length (mm) |         | Weight (g) |       |
|-----------------------|---------------------------------|-----|-------------|---------|------------|-------|
|                       |                                 |     | Mean        | Range   | Mean       | Total |
| August 19-20, 1974    |                                 |     |             |         |            |       |
|                       | <u>Carassius auratus</u>        | 3   | 308         | 292-321 | 436        | 1307  |
|                       | <u>Cyprinus carpio</u>          | 18  | 292         | 123-398 | 454        | 8181  |
|                       | <u>Dorosoma cepedianum</u>      | 63  | 116         | 82-302  | 30         | 1886  |
|                       | <u>Ictalurus nebulosus</u>      | 4   | 146         | 136-167 | 48         | 190   |
|                       | <u>I. punctatus</u>             | 1   | 162         |         | 30         | 30    |
|                       | <u>Morone chrysops</u>          | 4   | 104         | 94-130  | 16         | 63    |
|                       | <u>Notropis hudsonius</u>       | 7   | 111         | 102-120 | 13         | 94    |
|                       | <u>Perca flavescens</u>         | 56  | 180         | 115-230 | 86         | 4847  |
|                       | <u>Pomoxis annularis</u>        | 5   | 149         | 130-165 | 48         | 241   |
|                       | <u>P. nigromaculatus</u>        | 1   | 150         |         | 52         | 52    |
|                       | Subtotal                        | 162 |             |         |            | 16891 |
| September 12-13, 1974 |                                 |     |             |         |            |       |
|                       | <u>Alosa pseudoharengus</u>     | 146 | 103         | 90-200  | 14         | 2044  |
|                       | <u>Cyprinus carpio</u>          | 2   | 323         | 320-326 | 489        | 977   |
|                       | <u>Dorosoma cepedianum</u>      | 67  | 135         | 81-335  | 54         | 3641  |
|                       | <u>Morone chrysops</u>          | 6   | 226         | 130-257 | 202        | 1212  |
|                       | <u>Notropis hudsonius</u>       | 6   | 116         | 105-130 | 18         | 107   |
|                       | <u>Perca flavescens</u>         | 32  | 187         | 150-217 | 81         | 2590  |
|                       | <u>Pomoxis annularis</u>        | 2   | 147         | 139-154 | 42         | 83    |
|                       | <u>P. nigromaculatus</u>        | 1   | 174         |         | 90         | 90    |
|                       | Subtotal                        | 262 |             |         |            | 10744 |
| October 16-17, 1974   |                                 |     |             |         |            |       |
|                       | <u>Alosa pseudoharengus</u>     | 25  | 104         | 94-189  | 10         | 246   |
|                       | <u>Carassius auratus</u>        | 2   | 267         | 229-304 | 314        | 629   |
|                       | <u>Dorosoma cepedianum</u>      | 24  | 128         | 84-320  | 40         | 952   |
|                       | <u>Morone chrysops</u>          | 1   | 136         |         | 187        | 187   |
|                       | <u>Notropis hudsonius</u>       | 31  | 110         | 100-130 | 15         | 452   |
|                       | <u>Oncorhynchus kisutch</u>     | 1   | 642         |         | 2321       | 2321  |
|                       | <u>Osmerus eperlanus mordax</u> | 1   | 176         |         | 37         | 37    |
|                       | <u>Perca flavescens</u>         | 18  | 182         | 143-210 | 77         | 1387  |
|                       | <u>Stizostedion v. vitreum</u>  | 1   | 234         |         | 115        | 115   |
|                       | Subtotal                        | 104 |             |         |            | 6326  |

TABLE 12 (CON'T.)

ANALYSIS OF GILL NET CATCH AT LOCUST POINT,  
STATION 12 - APRIL - NOVEMBER, 1974

| Date                 | Taxa                            | No.  | Length (mm) |         | Weight (g) |       |
|----------------------|---------------------------------|------|-------------|---------|------------|-------|
|                      |                                 |      | Mean        | Range   | Mean       | Total |
| November 25-26, 1974 |                                 |      |             |         |            |       |
|                      | <u>Cyprinus carpio</u>          | 1    | 540         |         | 2973       | 2973  |
|                      | <u>Dorosoma cepedianum</u>      | 1    | 325         |         | 390        | 390   |
|                      | <u>Osmerus eperlanus mordax</u> | 3    | 146         | 138-156 | 22         | 65    |
|                      | <u>Perca flavescens</u>         | 1    | 190         |         | 90         | 90    |
|                      | Subtotal                        | 6    |             |         |            | 3518  |
| TOTAL                |                                 | 2554 |             |         |            | 71736 |

TABLE 13  
ANALYSIS OF SHORE SEINE CATCH FROM LOCUST POINT  
APRIL 12, 1974

| Station | Taxa                            | No. | Length (mm) |         | Weight (g) |       |
|---------|---------------------------------|-----|-------------|---------|------------|-------|
|         |                                 |     | Mean        | Range   | Mean       | Total |
| 23      |                                 | 3   | 152         | 89-203  | 46         | 137   |
|         | <u>Dorosoma cepedianum</u>      | 3   | 70          | 65-73   | 1          | 4     |
|         | <u>Labidesthes sicculus</u>     | 1   | 50          |         | 2          | 2     |
|         | <u>Lepomis humilis</u>          | 1   | 129         |         | 25         | 25    |
|         | <u>Minytrema melanops</u>       | 106 | 59          | 43-99   | 2          | 196   |
|         | <u>Notropis a. atherinoides</u> | 1   | 91          |         | 8          | 8     |
|         | <u>N. hudsonius</u>             | 115 |             |         |            | 372   |
|         | Subtotal                        |     |             |         |            |       |
| 24      |                                 | 2   | 134         | 116-152 | 50         | 100   |
|         | <u>Carassius auratus</u>        | 2   | 635         | 533-737 |            |       |
|         | <u>Cyprinus carpio</u>          | 18  | 202         | 101-381 | 23         | 162   |
|         | <u>Dorosoma cepedianum</u>      | 2   | 65          | 64-65   | 1          | 2     |
|         | <u>Labidesthes sicculus</u>     | 1   | 82          |         | 11         | 11    |
|         | <u>Lepomis humilis</u>          | 2   | 35          | 32-37   | 1          | 2     |
|         | <u>Micropterus d. dolomieu</u>  | 260 | 59          | 47-94   | 2          | 419   |
|         | <u>Notropis a. atherinoides</u> | 6   | 122         | 112-133 | 22         | 129   |
|         | <u>N. hudsonius</u>             | 293 |             |         |            | 825   |
|         | Subtotal                        |     |             |         |            |       |
| 25      |                                 | 82  | 60          | 45-88   | 2          | 144   |
|         | <u>Notropis a. atherinoides</u> | 1   | 93          |         | 8          | 8     |
|         | <u>N. hudsonius</u>             | 83  |             |         |            | 152   |
|         | Subtotal                        | 491 |             |         |            | 1349  |
| TOTAL   |                                 |     |             |         |            |       |

TABLE 14  
ANALYSIS OF SHORE SEINE CATCH FROM LOCUST POINT  
MAY 21, 1974

| Station | Taxa                            | No. | Length (mm) |         | Weight (g) |       |
|---------|---------------------------------|-----|-------------|---------|------------|-------|
|         |                                 |     | Mean        | Range   | Mean       | Total |
| 23      |                                 | 1   | 770         |         | 821        | 821   |
|         | <u>Lepisosteus osseus</u>       | 5   | 60          | 55-68   | 2          | 8     |
|         | <u>Notropis a. atherinoides</u> | 2   | 72          | 68-76   | 5          | 10    |
|         | <u>N. hudsonius</u>             | 8   |             |         |            | 839   |
|         | Subtotal                        |     |             |         |            |       |
| 24      |                                 | 1   | 177         |         | 54         | 54    |
|         | <u>Alosa pseudoharengus</u>     | 1   | 495         |         | 1472       | 1472  |
|         | <u>Cyprinus carpio</u>          | 4   | 308         | 155-380 | 339        | 1354  |
|         | <u>Dorosoma cepedianum</u>      | 30  | 61          | 50-80   | 2          | 49    |
|         | <u>Notropis a. atherinoides</u> | 1   | 232         |         | 34         | 34    |
|         | <u>Petromyzon marinus</u>       | 1   | 335         |         | 453        | 453   |
|         | <u>Morone chrysops</u>          | 38  |             |         |            | 3416  |
|         | Subtotal                        |     |             |         |            |       |
| 25      |                                 | 1   | 95          |         | 23         | 23    |
|         | <u>Lepomis cyanellus</u>        | 212 | 59          | 46-110  | 2          | 342   |
|         | <u>Notropis a. atherinoides</u> | 213 |             |         |            | 365   |
|         | Subtotal                        | 259 |             |         |            | 4620  |
| TOTAL   |                                 |     |             |         |            |       |

TABLE 15  
ANALYSIS OF SHORE SEINE CATCH FROM LOCUST POINT  
JUNE 13, 1974

| Station | Taxa                            | No. | Length (mm) |         | Weight (g) |       |
|---------|---------------------------------|-----|-------------|---------|------------|-------|
|         |                                 |     | Mean        | Range   | Mean       | Total |
| 23      |                                 | 41  | 20          | 16-23   |            |       |
|         | <u>Dorosoma cepedianum</u>      | 12  | 71          | 60-97   | 4          | 43    |
|         | <u>Notropis a. atherinoides</u> | 16  | 102         | 81-126  | 12         | 191   |
|         | <u>N. hudsonius</u>             | 69  |             |         |            | 234   |
|         | Subtotal                        |     |             |         |            |       |
| 24      |                                 | 1   | 22          |         |            |       |
|         | <u>Dorosoma cepedianum</u>      | 14  | 73          | 60-100  | 4          | 58    |
|         | <u>Notropis a. atherinoides</u> | 11  | 91          | 80-122  | 44         | 484   |
|         | <u>N. hudsonius</u>             | 26  |             |         |            | 542   |
|         | Subtotal                        |     |             |         |            |       |
| 25      |                                 | 3   | 580         | 462-677 | 3207       | 9620  |
|         | <u>Cyprinus carpio</u>          | 10* | 233         | 150-356 | 169        | 1686  |
|         | <u>Dorosoma cepedianum</u>      | 2   | 118         | 110-125 | 22         | 44    |
|         | <u>Morone chrysops</u>          | 15  | 71          | 44-104  | 4          | 56    |
|         | <u>Notropis a. atherinoides</u> | 27  | 101         | 77-132  | 11         | 304   |
|         | <u>N. hudsonius</u>             | 1   | 110         |         | 17         | 17    |
|         | <u>Pomoxis annularis</u>        | 203 |             |         |            | 11727 |
|         | Subtotal                        | 298 |             |         |            | 12503 |
| TOTAL   |                                 |     |             |         |            |       |

\* Plus 145 young-of-the-year.

TABLE 16  
ANALYSIS OF SHORE SEINE CATCH FROM LOCUST POINT  
JULY 9, 1974

| Station                          | Taxa                                 | No.                    | Length (mm) |         | Weight (g) |       |
|----------------------------------|--------------------------------------|------------------------|-------------|---------|------------|-------|
|                                  |                                      |                        | Mean        | Range   | Mean       | Total |
| 23                               | <u>Dorosoma cepedianum</u> (AD)      | 2                      | 226         | 224-228 | 146        | 292   |
|                                  | <u>Dorosoma cepedianum</u> (YOY)     | 390                    | 27          | 23-42   |            |       |
|                                  | <u>Morone chrysops</u> (YOY)         | 112                    | 25          | 17-37   |            |       |
|                                  | <u>Notropis a. atherinoides</u>      | 2                      | 96          | 91-101  |            |       |
|                                  | <u>N. hudsonius</u>                  | 3                      | 58          | 29-108  |            |       |
|                                  | <u>Perca flavescens</u> (YOY)        | 1                      | 30          | 30-31   |            |       |
|                                  | <u>Percina caprodes</u>              | 2                      | 30          |         |            |       |
|                                  | Subtotal                             | 512                    |             |         |            |       |
| 24                               | <u>Aplodinotus grunniens</u>         | 1                      | 97          | 208-261 | 201        | 11443 |
|                                  | <u>Dorosoma cepedianum</u> (AD)      | 57                     | 236         |         |            |       |
|                                  | <u>D. cepedianum</u> (YOY)           | 10838                  |             |         |            |       |
|                                  | <u>Morone chrysops</u> (YOY)         | 809                    |             |         |            |       |
|                                  | <u>Notropis a. atherinoides</u>      | 3                      | 66          |         |            |       |
|                                  | <u>N. hudsonius</u>                  | 8                      | 43          |         |            |       |
|                                  | <u>Perca flavescens</u> (YOY)        | 23                     |             |         |            |       |
|                                  | <u>Percina caprodes</u>              | 1                      | 28          |         |            |       |
|                                  | <u>Stizostedion v. vitreum</u> (YOY) | 1                      | 65          |         |            |       |
|                                  | Subtotal                             | 11741                  |             |         |            |       |
|                                  | 25                                   | <u>Cyprinus carpio</u> | 1           |         |            |       |
| <u>Dorosoma cepedianum</u> (YOY) |                                      | 632                    | 31          |         |            |       |
| <u>Morone chrysops</u> (YOY)     |                                      | 230                    | 28          |         |            |       |
| <u>Notropis a. atherinoides</u>  |                                      | 3                      | 75          |         |            |       |
| <u>N. hudsonius</u>              |                                      | 15                     | 33          |         |            |       |
| <u>Perca flavescens</u> (YOY)    |                                      | 12                     | 30          |         |            |       |
| <u>Percina caprodes</u>          |                                      | 4                      | 28          |         |            |       |
| Subtotal                         |                                      | 897                    |             |         |            |       |
| TOTAL                            |                                      | 13150                  |             |         |            | 12093 |

TABLE 17  
ANALYSIS OF SHORE SEINE CATCH FROM LOCUST POINT  
AUGUST 27, 1974

| Station | Taxa                            | No. | Length (mm) |        | Weight (g) |       |
|---------|---------------------------------|-----|-------------|--------|------------|-------|
|         |                                 |     | Mean        | Range  | Mean       | Total |
| 23      |                                 | 22  | 62          | 30-81  | 4          | 81    |
|         | <u>Alosa pseudoharengus</u>     | 1   | 87          |        | 10         | 10    |
|         | <u>Dorosoma cepedianum</u>      | 182 | 75          | 40-105 | 4          | 740   |
|         | <u>Notropis a. atherinoides</u> | 205 |             |        |            | 831   |
|         | Subtotal                        |     |             |        |            |       |
| 24      |                                 | 55  | 76          | 38-90  | 4          | 208   |
|         | <u>Alosa pseudoharengus</u>     | 1   | 120         |        | 20         | 20    |
|         | <u>Dorosoma cepedianum</u>      | 95  | 66          | 40-105 | 3          | 284   |
|         | <u>Notropis a. atherinoides</u> | 1   | 40          |        | 1          | 1     |
|         | <u>Pomoxis annularis</u>        | 152 |             |        |            | 513   |
|         | Subtotal                        |     |             |        |            |       |
| 25      |                                 | 4   | 61          | 30-75  | 3          | 13    |
|         | <u>Alosa pseudoharengus</u>     | 3   | 58          | 55-65  | 1          | 3     |
|         | <u>Labidesthes sicculus</u>     | 92  | 73          | 40-111 | 3          | 301   |
|         | <u>Notropis a. atherinoides</u> | 1   | 65          |        | 1          | 1     |
|         | <u>Osmerus eperlanus mordax</u> | 1   | 65          |        | 4          | 1     |
|         | <u>Percina caprodes</u>         | 101 |             |        |            | 319   |
|         | Subtotal                        |     |             |        |            |       |
| TOTAL   |                                 | 458 |             |        |            | 1663  |

TABLE 18  
ANALYSIS OF SHORE SEINE CATCH FROM LOCUST POINT  
September 12, 1974

| Station | Taxa                            | No. | Length (mm) |        | Weight (g) |       |
|---------|---------------------------------|-----|-------------|--------|------------|-------|
|         |                                 |     | Mean        | Range  | Mean       | Total |
| 23      |                                 | 15  | 68          | 57-88  | 4          | 59    |
|         | <u>Dorosoma cepedianum</u>      | 4   | 66          | 57-72  | 1          | 6     |
|         | <u>Labidesthes sicculus</u>     | 216 | 75          | 50-90  | 4          | 864   |
|         | <u>Notropis a. atherinoides</u> | 235 |             |        |            | 929   |
|         | Subtotal                        |     |             |        |            |       |
| 24      |                                 | 124 | 96          | 44-290 | 14         | 1736  |
|         | <u>Dorosoma cepedianum</u>      | 1   | 112         |        | 20         | 20    |
|         | <u>Morone chrysops</u>          | 169 | 71          | 50-107 | 3          | 570   |
|         | <u>Notropis a. atherinoides</u> | 294 |             |        |            | 2326  |
|         | Subtotal                        |     |             |        |            |       |
| 25      |                                 | 56  | 95          | 50-135 | 11         | 638   |
|         | <u>Dorosoma cepedianum</u>      | 5   | 65          | 53-70  | 2          | 8     |
|         | <u>Labidesthes sicculus</u>     | 1   | 70          |        | 4          | 4     |
|         | <u>Morone chrysops</u>          | 103 | 64          | 50-97  | 2          | 206   |
|         | <u>Notropis a. atherinoides</u> | 1   | 65          |        | 3          | 3     |
|         | <u>N. hudsonius</u>             | 1   | 70          |        | 2          | 2     |
|         | <u>Osmerus eperlanus mordax</u> | 1   | 53          |        | 1          | 1     |
|         | <u>Percina caprodes</u>         | 168 |             |        |            | 862   |
|         | Subtotal                        |     |             |        |            |       |
| TOTAL   |                                 | 697 |             |        |            | 4117  |

TABLE 19  
ANALYSIS OF SHORE SEINE CATCH FROM LOCUST POINT  
October 16, 1974

| Station | Taxa                            | No.  | Length (mm) |        | Weight (g) |       |
|---------|---------------------------------|------|-------------|--------|------------|-------|
|         |                                 |      | Mean        | Range  | Mean       | Total |
| 23      |                                 | 2    | 45          | 35-55  | 1          | 2     |
|         | <u>Alosa pseudoharengus</u>     | 15   | 83          | 57-110 | 7          | 98    |
|         | <u>Dorosoma cepedianum</u>      | 577  | 60          | 45-96  | 1          | 821   |
|         | <u>Notropis a. atherinoides</u> | 594  |             |        |            | 921   |
|         | Subtotal                        |      |             |        |            |       |
| 24      |                                 | 42   | 84          | 57-162 | 7          | 312   |
|         | <u>Dorosoma cepedianum</u>      | 655  | 55          | 21-110 | 2          | 1048  |
|         | <u>Notropis a. atherinoides</u> | 697  |             |        |            | 1360  |
|         | Subtotal                        |      |             |        |            |       |
| 25      |                                 | 21   | 71          | 50-102 | 5          | 103   |
|         | <u>Dorosoma cepedianum</u>      | 242  | 56          | 36-105 | 2          | 284   |
|         | <u>Notropis a. atherinoides</u> | 1    | 140         |        | 16         | 16    |
|         | <u>Osmerus eperlanus mordax</u> | 264  |             |        |            | 403   |
|         | Subtotal                        |      |             |        |            |       |
| TOTAL   |                                 | 1555 |             |        |            | 2684  |

TABLE 20  
ANALYSIS OF SHORE SEINE CATCH FROM LOCUST POINT  
November 14, 1974

| Station | Taxa                            | No.  | Length (mm) |        | Weight (g) |       |
|---------|---------------------------------|------|-------------|--------|------------|-------|
|         |                                 |      | Mean        | Range  | Mean       | Total |
| 23      |                                 | 1    | 91          |        | 9          | 9     |
|         | <u>Dorosoma cepedianum</u>      | 1    | 68          |        | 2          | 2     |
|         | <u>Labidesthes sicculus</u>     | 437  | 54          | 45-75  | 1          | 437   |
|         | <u>Notropis a. atherinoides</u> | 439  |             |        |            | 448   |
|         | Subtotal                        |      |             |        |            |       |
| 24      |                                 | 174  | 53          | 45-80  | 1          | 174   |
|         | <u>Notropis a. atherinoides</u> | 174  | 53          | 45-80  | 1          | 174   |
|         | Subtotal                        |      |             |        |            |       |
| 25      |                                 | 3    | 84          | 58-110 | 9          | 28    |
|         | <u>Dorosoma cepedianum</u>      | 1    | 58          |        | 1          | 1     |
|         | <u>Labidesthes sicculus</u>     | 1466 | 56          | 43-79  | 1          | 1764  |
|         | <u>Notropis a. atherinoides</u> | 1    | 31          |        |            | 1793  |
|         | <u>Pomoxis annularis</u>        | 1471 |             |        |            |       |
|         | Subtotal                        |      |             |        |            | 2415  |
| TOTAL   |                                 | 2084 |             |        |            |       |

TABLE 21  
ANALYSIS OF TRAWL CATCH FROM LOCUST POINT  
APRIL - NOVEMBER, 1974

| Date           | Taxa                            | No.  | Length (mm) |         | Weight (g) |       |
|----------------|---------------------------------|------|-------------|---------|------------|-------|
|                |                                 |      | Mean        | Range   | Mean       | Total |
| April 25, 1974 |                                 | 7    | 230         | 128-310 | 179        | 1251  |
|                | <u>Aplodinotus grunniens</u>    | 3    | 170         | 78-334  | 117        | 351   |
|                | <u>Ictalurus punctatus</u>      | 1    | 303         |         | 423        | 423   |
|                | <u>Morone chrysops</u>          | 4    | 121         | 110-135 | 21         | 82    |
|                | <u>Notropis hudsonius</u>       | 9    | 160         | 99-194  | 53         | 478   |
|                | <u>Perca flavescens</u>         | 24   |             |         |            | 2585  |
|                | Subtotal                        |      |             |         |            |       |
| May 21, 1974   |                                 | 2    | 168         | 160-175 | 33         | 66    |
|                | <u>Alosa pseudoharengus</u>     | 3    | 132         | 83-192  | 33         | 98    |
|                | <u>Aplodinotus grunniens</u>    | 3    | 103         | 91-111  | 10         | 30    |
|                | <u>Ictalurus punctatus</u>      | 1    | 175         |         | 36         | 36    |
|                | <u>Morone chrysops</u>          | 18   | 106         | 81-131  | 14         | 257   |
|                | <u>Notropis hudsonius</u>       | 27   |             |         |            | 487   |
|                | Subtotal                        |      |             |         |            |       |
| June 21, 1974  |                                 | 41   | 84          | 57-108  | 6          | 256   |
|                | <u>Notropis a. atherinoides</u> | 5    | 104         | 76-127  | 9          | 47    |
|                | <u>N. hudsonius</u>             | * 18 |             |         |            |       |
|                | <u>Osmerus eperlanus mordax</u> | * 60 |             |         |            |       |
|                | <u>Perca flavescens</u>         | * 10 |             |         |            |       |
|                | <u>Stizostedion v. vitreum</u>  | 134  |             |         |            | 303   |
|                | Subtotal                        |      |             |         |            |       |
| July 19, 1974  |                                 | 3    | 320         | 232-434 | 534        | 1601  |
|                | <u>Cyprinus carpio</u>          | 2    | 248         | 247-250 | 235        | 470   |
|                | <u>Ictalurus nebulosus</u>      | 5    | 125         | 97-145  | 20         | 101   |
|                | <u>I. punctatus</u>             | 2    | 171         | 150-102 | 80         | 160   |
|                | <u>Morone chrysops</u>          | 2    | 98          | 95-101  | 10         | 21    |
|                | <u>Notropis a. atherinoides</u> | 2    | 106         | 94-117  | 15         | 30    |
|                | <u>N. hudsonius</u>             | 1    | 166         |         | 64         | 64    |
|                | <u>Perca flavescens</u>         | 1    | 134         |         | 37         | 37    |
|                | <u>Pomoxis nigromaculatus</u>   | 18   |             |         |            | 2484  |
|                | Subtotal                        |      |             |         |            |       |

TABLE 21 CONT.  
ANALYSIS OF TRAWL CATCH FROM LOCUST POINT  
APRIL - NOVEMBER, 1974

| Date               | Taxa                            | No.  | Length (mm) |         | Weight (g) |        |
|--------------------|---------------------------------|------|-------------|---------|------------|--------|
|                    |                                 |      | Mean        | Range   | Mean       | Total  |
| August 16, 1974    |                                 |      |             |         |            |        |
|                    | <u>Alosa pseudoharengus</u>     | 31   | 63          | 30-81   | 3          | 97     |
|                    | <u>Aplodinotus grunniens</u>    | 1    | 136         |         | 30         | 30     |
|                    | <u>Cyprinus carpio</u>          | 1    | 337         |         | 570        | 570    |
|                    | <u>Dorosoma cepedianum</u>      | 1    | 52          | 30-66   | 3          | 102    |
|                    | <u>Ictalurus punctatus</u>      | 40   | 192         |         | 66         | 66     |
|                    | <u>Morone chrysops</u>          | 1    | 45          | 34-71   | 2          | 14     |
|                    | <u>Notropis a. atherinoides</u> | 8    | 98          | 81-116  | 8          | 23     |
|                    | <u>N. hudsonius</u>             | 3    | 30          | 27-33   | 1          | 2      |
|                    | <u>Stizostedion v. vitreum</u>  | 2    | 145         |         | 27         | 27     |
|                    | Subtotal                        | 1    |             |         |            | 931    |
|                    |                                 | 88   |             |         |            |        |
| September 13, 1974 |                                 |      |             |         |            |        |
|                    | <u>Alosa pseudoharengus</u>     | 15   | 84          | 33-93   | 6          | 87     |
|                    | <u>Aplodinotus grunniens</u>    | 1    | 85          |         | 8          | 8      |
|                    | <u>Cyprinus carpio</u>          | 1    | 280         |         | 315        | 315    |
|                    | <u>Dorosoma cepedianum</u>      | 3    | 66          | 47-97   | 5          | 16     |
|                    | <u>Morone chrysops</u>          | 21   | 48          | 23-78   | 2          | 44     |
|                    | <u>Notropis a. atherinoides</u> | 3    | 50          | 30-90   | 2          | 7      |
|                    | <u>N. hudsonius</u>             | 12   | 101         | 70-121  | 12         | 143    |
|                    | <u>Osmerus eperlanus mordax</u> | 3    | 49          | 44-57   | 1          | 3      |
|                    | <u>Perca flavescens</u>         | 4    | 124         | 63-180  | 37         | 146    |
|                    | <u>Pomoxis nigromaculatus</u>   | 1    | 171         |         | 101        | 101    |
|                    | Subtotal                        | 64   |             |         |            | 870    |
| October 10, 1974   |                                 |      |             |         |            |        |
|                    | <u>Alosa pseudoharengus</u>     | 25   | 87          | 65-95   | 8          | 193    |
|                    | <u>Dorosoma cepedianum</u>      | 38   | 92          | 70-117  | 12         | 445    |
|                    | <u>Notropis a. atherinoides</u> | 4    | 63          | 32-85   | 3          | 14     |
|                    | Subtotal                        | 67   |             |         |            | 652    |
| November 8, 1974   |                                 |      |             |         |            |        |
|                    | <u>Dorosoma cepedianum</u>      | 56   | 83          | 61-135  | 7          | 381    |
|                    | <u>Morone chrysops</u>          | 5    | 114         | 91-138  | 23         | 113    |
|                    | <u>Notropis a. atherinoides</u> | 917  | 56          | 43-123  | 1          | 1192   |
|                    | <u>N. hudsonius</u>             | 50   | 90          | 55-127  | 9          | 436    |
|                    | <u>Perca flavescens</u>         | 8    | 182         | 138-204 | 85         | 684    |
|                    | <u>Percina caprodes</u>         | 2    | 55          | 48-62   | 2          | 4      |
|                    | Subtotal                        | 1038 |             |         |            | 2810   |
| TOTAL              |                                 | 1460 |             |         |            | 11,122 |
| * Fry              |                                 |      |             |         |            |        |

TABLE 22

ANALYSIS OF TRAWL CATCH FROM THE INTAKE CANAL  
AT THE DAVIS-BESSE NUCLEAR POWER STATION - 1974

| Date              | Taxa                         | No. | Length (mm) |         | Weight (g) |       |
|-------------------|------------------------------|-----|-------------|---------|------------|-------|
|                   |                              |     | Mean        | Range   | Mean       | Total |
| June 18, 1974     |                              |     |             |         |            |       |
|                   | <u>Carassius auratus</u>     | 2   | 130         | 99-160  | 57         | 113   |
|                   | <u>Ictalurus nebulosus</u>   | 6   | 142         | 105-169 | 54         | 326   |
|                   | <u>I. punctatus</u>          | 1   | 90          |         | 9          | 9     |
|                   | <u>Pomoxis annularis</u>     | 21  | 89          | 76-126  | 11         | 224   |
|                   | <u>P. nigromaculatus</u>     | 1   | 142         |         | 43         | 43    |
|                   | Subtotal                     | 31  |             |         |            | 715   |
| August 27, 1974   |                              |     |             |         |            |       |
|                   | <u>Cyprinus carpio</u> (YOY) | 1   | 35          |         |            |       |
|                   | <u>Ictalurus melas</u>       | 25  | 75          | 55-225  | 19         | 482   |
|                   | <u>Lepomis gibbosus</u>      | 3   | 116         | 110-120 | 37         | 110   |
|                   | <u>Pomoxis annularis</u>     | 4   | 86          | 50-120  | 13         | 52    |
|                   | Subtotal                     | 33  |             |         |            | 644   |
| October 23, 1974* |                              |     |             |         |            |       |
|                   | <u>Cyprinus carpio</u>       | 1   | 555         |         | 2066       | 2066  |
|                   | Subtotal                     | 1   |             |         |            | 2066  |
| TOTAL             |                              | 65  |             |         |            | 3425  |

YOY - Designates young-of-the-year.

\* The canal was poisoned on September 25, 1974

TABLE 23

RESULTS OF TRAWLING EFFORT TO REMOVE FISH  
PRIOR TO POISONING THE INTAKE CANAL  
SEPTEMBER 24, 1974

| <u>Scientific Name</u>          | <u>Common Name</u>  | <u>No. Captured</u> |
|---------------------------------|---------------------|---------------------|
| <u>Aplodinotus grunniens</u>    | freshwater drum     | 2                   |
| <u>Carassius auratus</u>        | goldfish            | 9                   |
| <u>Cyprinus carpio</u>          | carp                | 1                   |
| <u>Dorosoma cepedianum</u>      | gizzard shad        | 51                  |
| <u>Ictalurus melas</u>          | black bullhead      | 56                  |
| <u>I. natalis</u>               | yellow bullhead     | 7                   |
| <u>I. nebulosus</u>             | brown bullhead      | 118                 |
| <u>I. punctatus</u>             | channel catfish     | 1                   |
| <u>Lepomis cyanellus</u>        | green sunfish       | 1                   |
| <u>L. gibbosus</u>              | pumpkinseed sunfish | 36                  |
| <u>L. macrochirus</u>           | bluegill sunfish    | 12                  |
| <u>Morone chrysops</u>          | white bass          | 2                   |
| <u>Notropis a. atherinoides</u> | emerald shiner      | 6                   |
| <u>Perca flavescens</u>         | yellow perch        | 6                   |
| <u>Percina caprodes</u>         | logperch darter     | 2                   |
| <u>Percopsis omiscomaycus</u>   | troutperch          | 3                   |
| <u>Pomoxis annularis</u>        | white crappie       | 96                  |
| <u>P. nigromaculatus</u>        | black crappie       | 2                   |
|                                 | crayfish            | 3                   |

414

TOTAL

TABLE 24

ANALYSIS OF HOOP NET CATCH IN NORTHWEST MARSH  
(STATION 21) - APRIL - NOVEMBER, 1974

| Date                  | Taxa                          | No. | Length (mm) |         | Weight (g) |       |
|-----------------------|-------------------------------|-----|-------------|---------|------------|-------|
|                       |                               |     | Mean        | Range   | Mean       | Total |
| April 24-25, 1974     |                               | 2   | 507         | 485-528 | 1260       | 2519  |
|                       | <u>Amia calva</u>             | 2   | 398         | 394-402 | 807        | 1613  |
|                       | <u>Cyprinus carpio</u>        | 3   | 247         | 200-297 | 295        | 886   |
|                       | <u>Pomoxis nigromaculatus</u> |     |             |         |            |       |
| May 21-22, 1974       |                               | 1   | 245         |         |            |       |
|                       | <u>Amia calva</u>             | 18  | 217         | 188-275 | 174        | 3127  |
|                       | <u>Pomoxis nigromaculatus</u> |     |             |         |            |       |
| June 13-14, 1974      |                               | 1   | 245         |         | 236        | 236   |
|                       | <u>Carassius auratus</u>      | 2   | 639         | 478-800 | 3086       | 6172  |
|                       | <u>Cyprinus carpio</u>        |     |             |         |            |       |
|                       | Blanding's Turtle             | 1   |             |         | 1103       | 1103  |
|                       | Midland Painted Turtle        | 3   |             |         | 382        | 1145  |
|                       | Snapping Turtle               | 1   |             |         | 4530       | 4530  |
| July 9-10, 1974       |                               | 1   | 201         |         | 148        | 148   |
|                       | <u>Carassius auratus</u>      | 7   | 377         | 210-690 |            | 941   |
|                       | <u>Cyprinus carpio</u>        | 5   |             |         | 367        | 1834  |
|                       | Midland Painted Turtle        |     |             |         |            |       |
| August 19-20, 1974    |                               | 3   | 407         | 280-610 | 964        | 2983  |
|                       | <u>Cyprinus carpio</u>        |     |             |         |            |       |
| September 17-18, 1974 |                               | 1   | 415         |         | 679        | 679   |
|                       | <u>Amia calva</u>             | 11  | 440         | 270-620 | 1303       | 14337 |
|                       | <u>Cyprinus carpio</u>        | 3   | 269         | 258-290 | 190        | 570   |
|                       | <u>Dorosoma cepedianum</u>    | 1   | 225         |         | 170        | 170   |
|                       | <u>Pomoxis nigromaculatus</u> |     |             |         |            |       |
| October 16-17, 1974   |                               | 1   | 242         |         | 210        | 210   |
|                       | <u>Pomoxis nigromaculatus</u> |     |             |         |            |       |
| November 25-26, 1974  |                               |     |             |         |            |       |
|                       | No fish                       |     |             |         |            |       |
| TOTAL                 |                               | 67  |             |         |            | 40208 |

TABLE 25

ANALYSIS OF HOOP NET CATCH IN SOUTHEAST MARSH  
(STATION 22) - APRIL - NOVEMBER, 1974

| Date                  | Taxa                            | No. | Length (mm) |         | Weight (g) |       |
|-----------------------|---------------------------------|-----|-------------|---------|------------|-------|
|                       |                                 |     | Mean        | Range   | Mean       | Total |
| April 24-25, 1974     | <u>Carassius auratus</u>        | 2   | 150         | 137-163 | 43         | 85    |
| May 21-22, 1974       | <u>Pomoxis nigromaculatus</u>   | 5   | 267         | 122-334 | 347        | 1737  |
| June 13-14, 1974      | <u>Amia calva</u>               | 2   | 434         | 411-456 | 678        | 1356  |
|                       | <u>Cyprinus carpio</u>          | 5   | 310         | 275-365 | 347        | 1736  |
|                       | <u>Micropterus s. salmoides</u> | 2   | 338         | 334-342 | 425        | 850   |
|                       | <u>Pomoxis annularis</u>        | 7   | 268         | 233-285 | 274        | 1921  |
|                       | <u>P. nigromaculatus</u>        | 7   | 230         | 208-261 | 193        | 1351  |
|                       | Midland Painted Turtle          | 1   |             |         | 356        | 356   |
|                       | Snapping Turtle                 | 1   |             |         | 4129       | 4129  |
| July 9-10, 1974       | <u>Amia calva</u>               | 3   | 473         | 362-560 | 934        | 2802  |
|                       | <u>Cyprinus carpio</u>          | 6   | 406         | 326-444 | 769        | 4612  |
|                       | Midland Painted Turtle          | 1   |             |         | 227        | 227   |
| August 19-20, 1974    | <u>Carassius auratus</u>        | 1   | 230         |         | 190        | 190   |
|                       | <u>Cyprinus carpio</u>          | 1   | 270         |         | 224        | 224   |
| September 17-18, 1974 | <u>Cyprinus carpio</u>          | 1   | 462         |         | 883        | 883   |
|                       | Snapping Turtle                 | 2   |             |         | 7380       | 14760 |
| October 16-17, 1974   | No fish                         |     |             |         |            |       |
| November 25-26, 1974  | <u>Amia calva</u>               | 23  | 459         | 345-525 | 1007       | 23162 |
|                       | <u>Pomoxis annularis</u>        | 1   | 222         |         | 453        | 453   |
| TOTAL                 |                                 | 73  |             |         |            | 70091 |

TABLE 26  
ANALYSIS OF ICHTHYOPLANKTON SAMPLED AT LOCUST POINT  
MAY - NOVEMBER, 1974

| Date               | Taxa                            | Length<br>(mm)<br>Range | Nos. of Individuals Collected |        |                     |        |
|--------------------|---------------------------------|-------------------------|-------------------------------|--------|---------------------|--------|
|                    |                                 |                         | Sta. 8 (Intake)               |        | Sta. 12 (Discharge) |        |
|                    |                                 |                         | Surface                       | Bottom | Surface             | Bottom |
| May 21, 1974       |                                 | 6-8                     | 190                           | 18     | 3                   | 9      |
|                    | <u>Perca flavescens</u>         | 9-12                    |                               | 1      |                     | 21     |
|                    | <u>Stizostedion v. vitreum</u>  |                         | 190                           | 19     | 3                   | 30     |
|                    | Subtotal                        |                         |                               |        |                     |        |
| June 14, 1974      |                                 | 11-22                   | 1                             | 9      | 409                 | 256    |
|                    | <u>Dorosoma cepedianum</u>      | 9                       |                               |        |                     | 1      |
|                    | <u>Micropterus d. dolomieu</u>  | 12-17                   | 2                             | 1      | 33                  | 7      |
|                    | <u>Perca flavescens</u>         |                         | 3                             | 10     | 442                 | 264    |
|                    | Subtotal                        |                         |                               |        | 6                   | 1      |
|                    | Unidentified fry                |                         | 36                            |        | 5                   | 15     |
|                    | Eggs                            |                         |                               |        |                     |        |
| July 10, 1974      |                                 | 6.5                     |                               |        | 1                   |        |
|                    | <u>Carassius auratus</u>        | 7-18                    | 6                             | 8      | 45                  | 39     |
|                    | <u>Dorosoma cepedianum</u>      | 8-18                    | 3815                          | 8      | 549                 | 10     |
|                    | <u>Notropis a. atherinoides</u> |                         | 3821                          | 16     | 595                 | 49     |
|                    | Subtotal                        |                         |                               |        |                     |        |
| August 19, 1974    |                                 | 18                      |                               |        | 1                   |        |
|                    | <u>Alosa pseudoharengus</u>     | 9-17                    | 3                             |        | 1                   | 1      |
|                    | <u>Notropis a. atherinoides</u> |                         | 3                             | 0      | 2                   | 1      |
|                    | Subtotal                        |                         |                               |        |                     |        |
| September 12, 1974 |                                 | 57                      |                               |        | 1                   |        |
|                    | <u>Labidesthes sicculus</u>     | 52-53                   |                               |        | 3                   |        |
|                    | <u>Notropis a. atherinoides</u> |                         | 0                             | 0      | 4                   | 0      |
|                    | Subtotal                        |                         |                               |        |                     |        |
| October 16, 1974   |                                 | 28-57                   |                               |        | 8                   | 1      |
|                    | <u>Notropis a. atherinoides</u> |                         | 0                             | 0      | 8                   | 1      |
|                    | Subtotal                        |                         |                               |        |                     |        |
| November 25, 1974  |                                 | 46-85                   |                               |        |                     | 56     |
|                    | <u>Notropis a. atherinoides</u> |                         | 0                             | 0      | 0                   | 56     |
|                    | Subtotal                        |                         |                               |        |                     |        |
| TOTAL              |                                 |                         | 4017                          | 45     | 1060                | 402    |

TABLE 27

SUMMARY ANALYSIS OF FOOD HABITS OF FISH  
COLLECTED AT LOCUST POINT, 1974

[illegible]

TABLE 27 (CON'T.)

SUMMARY ANALYSIS OF FOOD HABITS OF FISH  
COLLECTED AT LOCUST POINT, 1974

| Month    | Species                         | No.<br>Captured | %<br>Containing<br>food | Length (mm) |         | Food Items |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|----------|---------------------------------|-----------------|-------------------------|-------------|---------|------------|---------|-----------|-------------|---------------|---------------|-------------------|----------|----------|-----------|--------------|---------|------------|------------|---------|--------------|---------------------|----------------|----------------|------|--------------------|------|--------|--|--|
|          |                                 |                 |                         | Mean        | Range   | Nematodea  | Bryozoa | Cladocera | Bosmina sp. | Daphnia pulex | D. retrocurva | Leptodora kindtii | Copepoda | Calanoid | Cyclopoid | Gammarus sp. | Insecta | Caenis sp. | Coleoptera | Diptera | Chironomidae | C. (chironomus) sp. | Procladius sp. | Tanytarsus sp. | Fish | Notropis hudsonius | Eggs | Debris |  |  |
| August   | <u>Morone chrysops</u>          | 2               | 100                     | 171         | 150-192 |            |         |           |             | 100           | 50            | 100               |          |          |           |              |         |            |            |         |              |                     |                |                | 50   | 50                 |      | 50     |  |  |
|          | <u>Notropis a. atherinoides</u> | 2               | 50                      | 98          | 95-101  |            |         |           |             |               |               | 50                |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Notropis hudsonius</u>       | 2               | 0                       | 106         | 94-117  |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Perca flavescens</u>         | 1               | 100                     | 166         | -       |            |         |           |             | 100           | 100           | 100               |          |          | 100       |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Pomoxis nigromaculatus</u>   | 1               | 100                     | 134         | -       |            |         |           |             |               | 100           | 100               |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | Subtotal                        | 16              | 69                      |             |         |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Aplodinotus grunniens</u>    | 1               | 100                     | 136         | -       |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
| August   | <u>Ictalurus punctatus</u>      | 1               | 0                       | 192         | -       |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Notropis a. atherinoides</u> | 2               | 0                       | 107         | 97-116  |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Stizostedion v. vitreum</u>  | 1               | 100                     | 145         | -       |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | Subtotal                        | 5               | 40                      |             |         |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Dorosoma cepedianum</u>      | 15              | 67                      | 80          | 61-135  |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Morone chrysops</u>          | 5               | 80                      | 114         | 91-138  |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Notropis a. atherinoides</u> | 22              | 0                       | 61          | 46-87   |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
| November | <u>Notropis hudsonius</u>       | 14              | 21                      | 92          | 55-121  |            |         |           |             |               |               | 7                 |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Perca flavescens</u>         | 8               | 88                      | 183         | 138-204 |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | <u>Percina caprodes</u>         | 2               | 100                     | 55          | 48-62   |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | Subtotal                        | 66              | 39                      |             |         |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          | TOTAL                           | 183             | 56                      |             |         |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          |                                 |                 |                         |             |         |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |
|          |                                 |                 |                         |             |         |            |         |           |             |               |               |                   |          |          |           |              |         |            |            |         |              |                     |                |                |      |                    |      |        |  |  |

## Water Quality

The results of the monthly water quality determinations at Stations 1, 8 and 12 are shown in Tables 28 - 36. Solar Radiation measurements for Station 8 are given in Table 37 and current measurements for Stations 8 and 12 are listed in Table 38. Water quality measurements for the ice-free period of the first half of 1974 and the second half (July - December) of 1974 showed moderate ranges for the parameters tested (Table 39).

## STUDY ANALYSIS

### Plankton

Phytoplankton. Phytoplankton populations were highest in the fall and spring and lowest during the summer (Fig. 2). This correlated well with zooplankton populations which peaked during the summer and were lowest in the spring and fall. This type correlation was to be expected since zooplankters graze on phytoplankton.

No comparison could be made with results of previous years since this was the first year phytoplankton was analyzed quantitatively. However, a qualitative comparison with the results from project F-41-R-5 (1973) showed the same cycle of dominance by the three major groups, Bacillariophyceae (diatoms), Chlorophyceae (green algae), and Myxophyceae (blue-green algae). The Bacillariophyceans (cold water forms) dominated in the spring, Chlorophyceans (intermediate temperature forms) in the summer, Chlorophyceans and Myxophyceans (warm water forms) in the early fall, and Chlorophyceans and Bacillariophyceans in the late fall (Fig. 3). The large late summer or early fall bloom of Aphanizomenon sp. (Myxophyceae) was not as evident as in the past.

It should be noted that although specimens from 54 taxa were collected, the blooms in May and November were each due to a pulse of one taxa, Melosira sp. and Mougeotia sp., respectively (Table 3). In May, Melosira sp. made up approximately 87 percent of the total phytoplankton population, while Mougeotia sp. made up approximately 53 percent of the November population. Moreover, the summer dominance by Chlorophyceans was mainly due to a decrease in the Melosira sp. population, as the water warmed, rather than an increase in the Chlorophycean population (Fig. 3).

TABLE 28

## LAKE ERIE WATER QUALITY ANALYSES FOR APRIL 1974

Dates:  
Field 4-18-74  
Laboratory 4-19-74

| Parameters                 | Station No. 1   |                 | Station No. 8   |                 | Station No. 12  |                 | Range     | Mean | Standard Deviation |
|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------|------|--------------------|
|                            | Surface         | Bottom          | Surface         | Bottom          | Surface         | Bottom          |           |      |                    |
| Field Measurements:        |                 |                 |                 |                 |                 |                 |           |      |                    |
| Temperature (°C)           | 1330 hrs<br>9.3 | 1330 hrs<br>9.3 | 1400 hrs<br>8.0 | 1440 hrs<br>7.7 | 1430 hrs<br>9.0 | 1430 hrs<br>9.0 | 7.7-9.3   | 8.7  | 0.7                |
| Dissolved Oxygen (ppm)     | 12.6            | 12.8            | 13.2            | 13.2            | 12.8            | 13.0            | 12.6-13.2 | 12.9 | 0.2                |
| Conductivity (umhos/cm)    | 350             | 350             | 318             | 337             | 360             | 360             | 318-360   | 346  | 16                 |
| Transparency (m)           | 0.10            |                 | 0.10            |                 | 0.10            |                 | 0.1-0.1   | 0.1  | 0.0                |
| Depth (m)                  |                 | 1.4             |                 | 2.6             | 2.9             |                 | 1.4-2.9   | 2.3  | 0.8                |
| Laboratory Determinations: |                 |                 |                 |                 |                 |                 |           |      |                    |
| Calcium (mg/l)             | 49.6            | 49.6            | 47.6            | 46.4            | 50.8            |                 | 46.4-50.8 | 49.1 | 1.7                |
| Magnesium (mg/l)           | 7.0             | 7.2             | 5.0             | 5.8             | 5.5             |                 | 5.0-7.2   | 6.1  | 0.9                |
| Sodium (mg/l)              | 7.0             | 8.0             | 10.0            | 10.0            | 9.0             |                 | 7.0-10.0  | 9.0  | 1.2                |
| Chloride (mg/l)            | 20.3            | 20.3            | 19.3            | 19.3            | 20.3            |                 | 19.3-20.3 | 20.0 | 0.5                |
| Nitrate (mg/l)             | 2.39            | 2.39            | 1.20            | 1.99            | 1.20            |                 | 1.20-2.39 | 1.73 | 0.60               |
| Sulfate (mg/l)             | 35.5            | 42.0            | 42.0            | 37.0            | 45.5            |                 | 35.5-45.5 | 40.6 | 3.7                |
| Phosphorous (mg/l)         | 0.07            | 0.09            | 0.11            | 0.12            | 0.08            |                 | 0.07-0.12 | 0.10 | 0.02               |
| Silica (mg/l)              | 3.61            | 3.19            | 2.81            | 3.09            | 3.83            |                 | 2.81-3.83 | 3.34 | 0.38               |
| Total Alkalinity (mg/l)    | 100             | 96              | 90              | 94              | 96              |                 | 90-100    | 96   | 3                  |
| B.O.D. (mg/l)              | 0.12            | 4.72            | 0.72            | 0.92            | 0.92            |                 | 0.12-4.72 | 1.98 | 2.06               |
| Suspended Solids (mg/l)    | 109             | 93              | 76              | 77              | 77              |                 | 76-109    | 87   | 13                 |
| Dissolved Solids (mg/l)    | 318             | 304             | 282             | 284             | 392             |                 | 282-396   | 329  | 52                 |
| Turbidity (F.T.U.)         | 120             | 115             | 100             | 105             | 105             |                 | 100-120   | 109  | 7                  |
| pH                         | 7.3             | 7.5             | 7.4             | 7.7             | 7.4             |                 | 7.3-7.7   | 7.5  | 0.2                |

TABLE 29

## LAKE ERIE WATER QUALITY ANALYSES FOR MAY 1974

Dates:

Field 5-22-74

Laboratory 5-23-74

| Parameters                        | Station No. 1    |                  | Station No. 8    |                  | Station No. 12   |                  | Range     | Mean | Standard Deviation |
|-----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|------|--------------------|
|                                   | Surface          | Bottom           | Surface          | Bottom           | Surface          | Bottom           |           |      |                    |
| <u>Field Measurements:</u>        |                  |                  |                  |                  |                  |                  |           |      |                    |
| Temperature (°C)                  | 1015 hrs<br>15.0 | 1015 hrs<br>14.0 | 1045 hrs<br>14.9 | 1045 hrs<br>14.1 | 1145 hrs<br>15.1 | 1145 hrs<br>14.2 | 14.1-15.1 | 14.6 | 0.5                |
| Dissolved Oxygen (ppm)            | 9.9              | 9.3              | 9.8              | 9.8              | 9.9              | 9.6              | 9.3-9.9   | 9.7  | 0.2                |
| Conductivity (umhos/cm)           | 285              | 283              | 285              | 285              | 285              | 288              | 283-288   | 285  |                    |
| Transparency (m)                  | 0.25             |                  | 0.35             |                  | 0.30             |                  | 0.25-0.35 | 0.30 | 0.05               |
| Depth (m)                         |                  | 2.3              |                  | 3.3              |                  | 2.8              | 2.3-3.3   | 2.8  | 0.5                |
| <u>Laboratory Determinations:</u> |                  |                  |                  |                  |                  |                  |           |      |                    |
| Calcium (mg/l)                    | 34.4             | 34.4             | 34.0             | 34.0             | 34.0             | 34.0             | 34.0-34.4 | 34.1 | 0.2                |
| Magnesium (mg/l)                  | 7.4              | 7.4              | 7.6              | 7.7              | 7.7              | 7.7              | 7.4-7.7   | 7.6  | 0.2                |
| Sodium (mg/l)                     | 12.6             | 11.6             | 13.4             | 12.6             | 12.6             | 12.6             | 11.6-13.4 | 12.6 | 0.6                |
| Chloride (mg/l)                   | 17.8             | 17.8             | 17.8             | 17.8             | 17.8             | 17.6             | 17.6-17.8 | 17.8 | 0.1                |
| Nitrate (mg/l)                    | 0.0              | 0.0              | 0.15             | 0.15             | 0.07             | 0.15             | 0.0-0.15  | 0.09 | 0.07               |
| Sulfate (mg/l)                    | 29.0             | 28.5             | 29.0             | 29.0             | 28.8             | 28.8             | 28.8-29.0 | 28.9 | 0.2                |
| Phosphorous (mg/l)                | 0.25             | 0.40             | 0.23             | 0.27             | 0.41             | 0.44             | 0.23-0.44 | 0.33 | 0.09               |
| Silica (mg/l)                     | 0.11             | 0.11             | 0.11             | 0.11             | 0.11             | 0.11             | 0.11-0.11 | 0.11 | 0.00               |
| Total Alkalinity (mg/l)           | 93               | 92               | 94               | 92               | 93               | 93               | 92-94     | 93   | 1                  |
| B.O.D. (mg/l)                     | 1.5              | 1.6              | 1.3              | 0.5              | 1.4              | 0.6              | 0.5-1.5   | 1.2  | 0.5                |
| Suspended Solids (mg/l)           | 26               | 18               | 17               | 17               | 22               | 20               | 17-26     | 20   | 4                  |
| Dissolved Solids (mg/l)           | 106              | 114              | 118              | 124              | 116              | 116              | 106-124   | 116  | 6                  |
| Turbidity (F.T.U.)                | 18               | 18               | 15               | 15               | 17               | 17               | 15-18     | 17   | 1                  |
| pH                                | 8.4              | 8.4              | 8.6              | 8.4              | 8.6              | 8.6              | 8.4-8.6   | 8.5  | 0.1                |

TABLE 30

## LAKE ERIE WATER QUALITY ANALYSES FOR JUNE 1974

Dates:

Field 6-19-74

Laboratory 6-19-74

| Parameters                        | Station No. 1    |                  | Station No. 8    |                  | Station No. 12   |                  | Range     | Mean | Standard Deviation |
|-----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|------|--------------------|
|                                   | Surface          | Bottom           | Surface          | Bottom           | Surface          | Bottom           |           |      |                    |
| <u>Field Measurements:</u>        |                  |                  |                  |                  |                  |                  |           |      |                    |
| Temperature (°C)                  | 1220 hrs<br>18.5 | 1220 hrs<br>18.0 | 0955 hrs<br>19.3 | 0955 hrs<br>18.0 | 1110 hrs<br>20.0 | 1110 hrs<br>19.0 | 18.0-20.0 | 18.8 | 0.79               |
| Dissolved Oxygen (ppm)            | 8.6              | 8.2              | 10.2             | 8.0              | 9.9              | 8.4              | 8.0-10.2  | 8.9  | 0.9                |
| Conductivity (umhos/cm)           | 275              | 290              | 280              | 290              | 320              | 320              | 275-320   | 296  | 20                 |
| Transparency (m)                  | 0.20             |                  | 0.60             |                  | 0.30             |                  | 0.20-0.60 | 0.37 | 0.21               |
| Depth (m)                         |                  | 2.5              |                  | 4.3              |                  | 3.8              | 2.5-4.3   | 3.5  | 0.9                |
| <u>Laboratory Determinations:</u> |                  |                  |                  |                  |                  |                  |           |      |                    |
| Calcium (mg/l)                    | 38.0             | 42.8             | 35.6             | 34.8             | 34.8             | 35.2             | 34.8-42.8 | 36.9 | 3.1                |
| Magnesium (mg/l)                  | 11.0             | 8.2              | 8.9              | 9.4              | 9.1              | 7.7              | 7.7-11.0  | 9.1  | 1.1                |
| Sodium (mg/l)                     | 15.0             | 13.5             | 10.5             | 10.5             | 10.5             | 10.5             | 10.5-15.0 | 11.8 | 2.0                |
| Chloride (mg/l)                   | 26.0             | 24.0             | 19.3             | 19.3             | 19.0             | 19.5             | 19.0-26.0 | 21.2 | 3.0                |
| Nitrate (mg/l)                    | 0.84             | 0.80             | 0.0              | 0.0              | 0.0              | 0.0              | 0.0-0.84  | 0.27 | 0.42               |
| Sulfate (mg/l)                    | 42.5             | 40.0             | 29.0             | 29.0             | 28.0             | 28.5             | 28.0-42.5 | 32.8 | 6.6                |
| Phosphorous (mg/l)                | 0.06             | 0.05             | 0.04             | 0.04             | 0.05             | 0.05             | 0.04-0.06 | 0.05 | 0.01               |
| Silica (mg/l)                     | 0.32             | 0.36             | 0.26             | 0.17             | 0.40             | 0.49             | 0.17-0.49 | 0.32 | 0.14               |
| Total Alkalinity (mg/l)           | 92               | 96               | 92               | 92               | 92               | 96               | 92-96     | 93   | 2                  |
| B.O.D. (mg/l)                     | 3.6              | 3.1              | 2.7              | 3.1              | 1.8              | 2.5              | 1.8-3.6   | 2.8  | 0.6                |
| Suspended Solids (mg/l)           | 12               | 12               | 8                | 10               | 11               | 13               | 8-13      | 11   | 2                  |
| Dissolved Solids (mg/l)           | 104              | 102              | 86               | 89               | 90               | 90               | 86-104    | 94   | 8                  |
| Turbidity (F.T.U.)                | 17               | 20               | 9                | 10               | 13               | 15               | 9-20      | 14   | 4                  |
| pH                                | 7.8              | 7.8              | 8.1              | 8.2              | 7.8              | 7.8              | 7.8-8.2   | 7.9  | 0.2                |

TABLE 31

## LAKE ERIE WATER QUALITY ANALYSES FOR JULY 1974

 Dates:  
 Field 7-17-74  
 Laboratory 7-18-74

| Parameters                        | Station No. 1    |                  | Station No. 8    |                  | Station No. 12   |                  | Range      | Mean | Standard Deviation |
|-----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------|------|--------------------|
|                                   | Surface          | Bottom           | Surface          | Bottom           | Surface          | Bottom           |            |      |                    |
| <u>Field Measurements:</u>        |                  |                  |                  |                  |                  |                  |            |      |                    |
| Temperature (°C)                  | 1005 hrs<br>24.5 | 1005 hrs<br>23.8 | 1105 hrs<br>25.3 | 1105 hrs<br>24.0 | 1150 hrs<br>25.4 | 1150 hrs<br>24.1 | 23.8-25.4  | 24.5 | 0.7                |
| Dissolved Oxygen (ppm)            | 8.6              | 7.4              | 8.1              | 6.3              | N.A.             | 6.7              | 6.3-8.6    | 7.4  | 1.0                |
| Conductivity (umhos/cm)           | 259              | 255              | 255              | N.A.             | 230              | 220              | 220-259    | 244  | 18                 |
| Transparency (m)                  | 0.35             |                  | 0.55             |                  | 0.35             |                  | 0.35-0.55  | 0.42 | 0.12               |
| Depth (m)                         |                  | 2.4              |                  | 5.0              |                  | 3.8              | 2.4-5.0    | 3.7  | 1.3                |
| <u>Laboratory Determinations:</u> |                  |                  |                  |                  |                  |                  |            |      |                    |
| Calcium (mg/l)                    | 36.0             | 36.0             | 34.0             | 34.4             | 32.8             | 36.4             | 32.8-36.4  | 34.9 | 1.4                |
| Magnesium (mg/l)                  | 8.2              | 8.6              | 8.4              | 8.2              | 8.9              | 8.9              | 8.2-8.9    | 8.5  | 0.3                |
| Sodium (mg/l)                     | 10.8             | 10.8             | 9.8              | 9.8              | 10.8             | 10.3             | 9.8-10.8   | 10.4 | 0.5                |
| Chloride (mg/l)                   | 17.0             | 17.0             | 16.3             | 16.0             | 17.0             | 16.8             | 16.0-17.0  | 16.7 | 0.4                |
| Nitrate (mg/l)                    | 0.84             | 0.84             | 3.10             | 2.40             | 3.10             | 1.60             | 0.84-3.10  | 1.98 | 1.04               |
| Sulfate (mg/l)                    | 27.0             | 28.5             | 24.5             | 24.0             | 25.5             | 24.5             | 24.0-28.5  | 25.7 | 1.8                |
| Phosphorus (mg/l)                 | 0.04             | 0.05             | 0.05             | 0.028            | 0.06             | 0.07             | 0.028-0.07 | 0.05 | 0.01               |
| Silica (mg/l)                     | 0.79             | 0.99             | 0.81             | 0.93             | 0.88             | 0.91             | 0.79-0.99  | 0.89 | 0.08               |
| Total Alkalinity (mg/l)           | 96               | 96               | 86               | 86               | 94               | 96               | 86-96      | 92   | 5                  |
| B.O.D. (mg/l)                     | N.A.             | N.A.             | N.A.             | N.A.             | N.A.             | N.A.             | -          | -    | -                  |
| Suspended Solids (mg/l)           | 37               | 38               | 20               | 27               | 36               | 37               | 20-38      | 33   | 7                  |
| Dissolved Solids (mg/l)           | 180              | 182              | 174              | 180              | 176              | 190              | 176-190    | 180  | 6                  |
| Turbidity (F.T.U.)                | 8                | 9                | 9                | 8                | 9                | 21               | 8-21       | 11   | 5                  |
| pH                                | 8.4              | 8.3              | 8.5              | 8.2              | 8.5              | 8.1              | 8.1-8.5    | 8.3  | 0.2                |
| Conductivity (umhos/cm)           |                  |                  |                  |                  |                  |                  |            |      |                    |

N.A. - Not Analyzed.

TABLE 32

LAKE ERIE WATER QUALITY ANALYSES FOR AUGUST 1974

Dates:  
Field  
Laboratory

| Parameters                        | Station No. 1 |          | Station No. 8 |          | Station No. 12 |          | Range     | Mean | Standard Deviation |
|-----------------------------------|---------------|----------|---------------|----------|----------------|----------|-----------|------|--------------------|
|                                   | Bottom        |          | Bottom        |          | Bottom         |          |           |      |                    |
|                                   | Surface       | 1115 hrs | Surface       | 1145 hrs | Surface        | 1250 hrs |           |      |                    |
| <u>Field Measurements:</u>        |               |          |               |          |                |          |           |      |                    |
| Temperature (°C)                  | 24.9          | 24.2     | 25.2          | 24.2     | 25.4           | 24.5     | 24.2-25.4 | 24.7 | 0.5                |
| Dissolved Oxygen (ppm)            | 6.9           | 5.7      | 8.1           | 7.3      | 8.4            | 6.6      | 5.7-8.4   | 7.2  | 1.0                |
| Conductivity (umhos/cm)           | 0.50          |          | 0.45          |          | 0.50           | 2.8      | 0.45-0.50 | 0.48 | 0.03               |
| Transparency (m)                  |               | 1.9      |               | 5.0      |                |          | 1.9-5.0   | 3.2  | 1.6                |
| Depth (m)                         |               |          |               |          |                |          |           |      |                    |
| <u>Laboratory Determinations:</u> |               |          |               |          |                |          |           |      |                    |
| Calcium (mg/l)                    | 38.8          | 40.4     | 40.0          | 39.2     | 38.4           | 40.4     | 38.4-40.4 | 39.5 | 0.9                |
| Magnesium (mg/l)                  | 6.2           | 7.2      | 5.8           | 5.5      | 7.0            | 5.3      | 5.3-7.2   | 6.2  | 0.8                |
| Sodium (mg/l)                     | 12.8          | 12.8     | 10.3          | 10.3     | 10.3           | 10.3     | 10.3-12.8 | 11.1 | 1.3                |
| Chloride (mg/l)                   | 18.3          | 21.0     | 18.3          | 18.3     | 18.3           | 18.3     | 18.3-21.0 | 18.8 | 1.0                |
| Nitrate (mg/l)                    | 0.0           | 0.0      | 0.0           | 0.0      | 0.0            | 0.0      |           | 0.0  | 0.0                |
| Sulfate (mg/l)                    | 26.5          | 32.0     | 25.0          | 23.0     | 25.5           | 23.5     | 23.0-32.0 | 25.9 | 3.3                |
| Phosphorus (mg/l)                 | 0.03          | 0.03     | 0.03          | 0.06     | 0.03           | 0.04     | 0.03-0.06 | 0.04 | 0.01               |
| Silica (mg/l)                     | 0.37          | 0.38     | 0.38          | 0.38     | 0.33           | 0.41     | 0.33-0.41 | 0.38 | 0.03               |
| Total Alkalinity (mg/l)           | 96            | 94       | 94            | 92       | 96             | 94       | 92-96     | 94   | 1.5                |
| B.O.D. (mg/l)                     | 4             | 4        | 2             | 3        | 3              | 3        | 2-4       | 3    | 0.8                |
| Suspended Solids (mg/l)           | 16            | 19       | 18            | 15       | 14             | 22       | 14-22     | 17   | 3                  |
| Dissolved Solids (mg/l)           | 258           | 252      | 228           | 226      | 222            | 228      | 222-258   | 236  | 15                 |
| Turbidity (F.T.U.)                | 8             | 10       | 10            | 10       | 8              | 15       | 8-15      | 10   | 2.5                |
| pH                                | 8.5           | 8.0      | 8.6           | 8.5      | 8.3            | 8.3      | 8.0-8.5   | 8.4  | 0.2                |
| Conductivity (umhos/cm)           | 300           | 325      | 295           | 285      | 285            | 280      | 280-325   | 295  | 16                 |

TABLE 33

## LAKE ERIE WATER QUALITY ANALYSES FOR SEPTEMBER 1974

Dates:  
Field 9-10-74  
Laboratory 9-10-74

| Parameters                 | Station No. 1 |         | Station No. 8 |         | Station No. 12 |          | Range     | Mean | Standard Deviation |
|----------------------------|---------------|---------|---------------|---------|----------------|----------|-----------|------|--------------------|
|                            | Surface       | Bottom  | Surface       | Bottom  | Surface        | Bottom   |           |      |                    |
| Field Measurements:        | 915 hrs       | 915 hrs | 950 hrs       | 950 hrs | 1030 hrs       | 1030 hrs |           |      |                    |
| Temperature (°C)           | 19.5          | 19.5    | 19.5          | 19.5    | 19.0           | 19.0     | 19.0-19.5 | 19.3 | 0.3                |
| Dissolved Oxygen (ppm)     | 7.9           | 7.8     | 9.2           | 8.9     | 8.5            | 8.2      | 7.8-9.2   | 8.4  | 0.6                |
| Conductivity (umhos/cm)    | 0.50          |         | 0.60          |         | 0.60           |          | 0.50-0.60 | 0.57 | 0.06               |
| Transparency (m)           |               | 1.7     |               | 4.1     |                | 3.2      | 1.7-4.1   | 3.0  | 1.2                |
| Depth (m)                  |               |         |               |         |                |          |           |      |                    |
| Laboratory Determinations: |               |         |               |         |                |          |           |      |                    |
| Calcium (mg/l)             | 36.0          | 36.4    | 35.2          | 36.0    | 36.0           | 36.0     | 35.2-36.4 | 35.9 | 0.4                |
| Magnesium (mg/l)           | 7.4           | 6.7     | 7.2           | 6.5     | 6.7            | 6.7      | 6.5-7.4   | 6.9  | 0.4                |
| Sodium (mg/l)              | 9.6           | 9.6     | 9.3           | 9.6     | 9.6            | 9.6      | 9.3-9.6   | 9.6  | 0.1                |
| Chloride (mg/l)            | 18.7          | 18.7    | 17.2          | 17.2    | 17.2           | 17.2     | 17.2-18.7 | 17.7 | 0.8                |
| Nitrate (mg/l)             | 0.0           | 0.0     | 0.0           | 0.0     | 0.0            | 0.0      |           | 0.0  | 0.0                |
| Sulfate (mg/l)             | 24.0          | 22.5    | 24.5          | 22.5    | 21.0           | 22.0     | 21.0-24.5 | 22.8 | 1.3                |
| Phosphorus (mg/l)          | 0.05          | 0.06    | 0.06          | 0.05    | 0.05           | 0.07     | 0.05-0.07 | 0.06 | 0.01               |
| Silica (mg/l)              | 0.09          | 0.11    | 0.17          | 0.19    | 0.12           | 0.19     | 0.09-0.19 | 0.15 | 0.04               |
| Total Alkalinity (mg/l)    | 94            | 93      | 96            | 94      | 96             | 94       | 93-96     | 95   | 1                  |
| B.O.D. (mg/l)              | 3             | 3       | 2             | 2       | 3              | 2        | 2-3       | 2.5  | 0.6                |
| Suspended Solids (mg/l)    | 15            | 17      | 15            | 9       | 11             | 14       | 9-17      | 14   | 3                  |
| Dissolved Solids (mg/l)    | 150           | 146     | 148           | 156     | 150            | 150      | 146-150   | 150  | 3                  |
| Turbidity (F.T.U.)         | 5             | 8       | 5             | 5       | 5              | 4        | 4-8       | 5    | 1                  |
| pH                         | 8.2           | 8.3     | 8.4           | 7.8     | 7.9            | 8.4      | 7.8-8.4   | 8.2  | 0.3                |
| Conductivity (umhos/cm)    | 264           | 265     | 265           | 267     | 264            | 264      | 264-267   | 265  | 1                  |

TABLE 34

## LAKE ERIE WATER QUALITY ANALYSES FOR OCTOBER 1974

Dates:  
Field 10-9-74  
Laboratory 10-10-74

| Parameters                 | Station No. 1 |        | Station No. 8 |        | Station No. 12 |        | Range     | Mean | Standard Deviation |
|----------------------------|---------------|--------|---------------|--------|----------------|--------|-----------|------|--------------------|
|                            | Surface       | Bottom | Surface       | Bottom | Surface        | Bottom |           |      |                    |
| Field Measurements:        |               |        |               |        |                |        |           |      |                    |
| Temperature (°C)           | 12.0          | 11.0   | 12.0          | 11.5   | 12.0           | 11.5   | 11.0-12.0 | 11.7 | 0.4                |
| Dissolved Oxygen (ppm)     | 11.2          | 11.1   | 10.4          | 10.2   | 12.1           | 11.8   | 10.2-12.1 | 11.1 | 0.8                |
| Conductivity (umhos/cm)    | 0.45          |        | 0.50          |        | 0.50           |        | 0.45-0.50 | 0.50 | 0.03               |
| Transparency (m)           |               |        |               |        |                |        | 1.5-4.0   | 2.8  | 1.3                |
| Depth (m)                  |               | 1.5    |               | 4.0    |                | 2.8    |           |      |                    |
| Laboratory Determinations: |               |        |               |        |                |        |           |      |                    |
| Calcium (mg/l)             | 34.4          | 34.4   | 34.4          | 32.8   | 32.8           | 32.8   | 32.8-34.4 | 33.6 | 0.9                |
| Magnesium (mg/l)           | 6.7           | 6.7    | 6.7           | 7.2    | 7.9            | 7.9    | 6.7-7.9   | 7.2  | 0.6                |
| Sodium (mg/l)              | 12.0          | 13.3   | 15.3          | 15.3   | 14.4           | 15.3   | 12.0-15.3 | 14.3 | 1.4                |
| Chloride (mg/l)            | 16.8          | 16.8   | 18.3          | 17.5   | 16.8           | 17.5   | 16.8-18.3 | 17.3 | 0.6                |
| Nitrate (mg/l)             | 1.2           | 1.2    | 2.0           | 1.6    | 1.6            | 1.2    | 1.2-2.0   | 1.5  | 0.3                |
| Sulfate (mg/l)             | 24.5          | 28.0   | 29.0          | 28.0   | 30.5           | 27.0   | 24.5-30.5 | 27.8 | 2.0                |
| Phosphorus (mg/l)          | 0.0           | 0.0    | 0.0           | 0.0    | 0.0            | 0.0    |           | 0.0  | 0.0                |
| Silica (mg/l)              | 0.04          | 0.06   | 0.05          | 0.06   | 0.05           | 0.09   | 0.04-0.09 | 0.06 | 0.02               |
| Total Alkalinity (mg/l)    | 89            | 90     | 91            | 94     | 91             | 92     | 89-94     | 91   | 1.7                |
| B.O.D. (mg/l)              | 2             | 3      | 3             | 3      | 3              | 2      | 2-3       | 2.7  | 0.5                |
| Suspended Solids (mg/l)    | 9             | 14     | 10            | 14     | 9              | 10     | 9-14      | 11   | 2                  |
| Dissolved Solids (mg/l)    | 174           | 188    | 182           | 186    | 194            | 194    | 174-194   | 186  | 8                  |
| Turbidity (F.T.U.)         | 9             | 10     | 10            | 10     | 10             | 10     | 9-10      | 10   | 0.4                |
| pH                         | 9.0           | 8.6    | 9.0           | 8.9    | 8.9            | 8.8    | 8.6-9.0   | 8.9  | 0.2                |
| Conductivity (umhos/cm)    | 275           | 285    | 285           | 285    | 285            | 280    | 275-285   | 283  | 4                  |

TABLE 35

## LAKE ERIE WATER QUALITY ANALYSES FOR NOVEMBER 1974

 Dates:  
 Field 11-7-74  
 Laboratory 11-8-74

| Parameters                 | Station No. 1 |        | Station No. 8 |        | Station No. 12 |        | Range     | Mean | Standard Deviation |
|----------------------------|---------------|--------|---------------|--------|----------------|--------|-----------|------|--------------------|
|                            | Surface       | Bottom | Surface       | Bottom | Surface        | Bottom |           |      |                    |
| Field Measurements:        |               |        |               |        |                |        |           |      |                    |
| Temperature (°C)           | 8.2           | 8.2    | 9.3           | 9.5    | 8.5            | 8.3    | 8.2-9.5   | 8.7  | 0.6                |
| Dissolved Oxygen (ppm)     | 11.4          | 11.2   | 11.1          | 11.0   | 11.5           | 11.3   | 11.0-11.5 | 11.3 | 0.2                |
| Conductivity (umhos/cm)    | 0.30          |        | 0.30          |        | 0.30           |        | -         | 0.30 | 0.0                |
| Transparency (m)           |               |        |               |        |                |        |           | 3.1  | 0.9                |
| Depth (m)                  |               | 2.3    |               | 4.0    |                | 3.0    | 2.3-4.0   |      |                    |
| Laboratory Determinations: |               |        |               |        |                |        |           |      |                    |
| Calcium (mg/l)             | 36.8          | 36.8   | 36.8          | 36.0   | 36.8           | 34.8   | 34.8-36.8 | 36.3 | 0.8                |
| Magnesium (mg/l)           | 7.0           | 6.2    | 4.8           | 7.4    | 7.4            | 8.6    | 4.8-8.6   | 6.9  | 1.3                |
| Sodium (mg/l)              | 7.8           | 7.8    | 7.5           | 7.5    | 7.7            | 7.7    | 7.5-7.8   | 7.7  | 0.1                |
| Chloride (mg/l)            | 14.3          | 12.4   | 15.0          | 14.5   | 14.5           | 15.0   | 12.4-15.0 | 14.3 | 1.0                |
| Nitrate (mg/l)             | 3.84          | 3.52   | 2.9           | 2.6    | 1.7            | 5.1    | 1.7-5.1   | 3.3  | 1.2                |
| Sulfate (mg/l)             | 24.0          | 24.0   | 24.0          | 24.0   | 25.0           | 25.5   | 24.0-25.5 | 24.4 | 0.7                |
| Phosphorus (mg/l)          | 0.02          | 0.02   | 0.02          | 0.02   | 0.03           | 0.03   | 0.02-0.03 | 0.02 | 0.01               |
| Silica (mg/l)              | 0.16          | 0.15   | 0.15          | 0.12   | 0.14           | 0.16   | 0.12-0.16 | 0.15 | 0.02               |
| Total Alkalinity (mg/l)    | 94            | 95     | 88            | 87     | 90             | 90     | 87-95     | 91   | 3                  |
| B.O.D. (mg/l)              | 2             | 3      | 3             | 2      | 2              | 3      | 2-3       | 3    | 1                  |
| Suspended Solids (mg/l)    | 42            | 23     | 25            | 28     | 30             | 34     | 23-42     | 30   | 7                  |
| Dissolved Solids (mg/l)    | 140           | 152    | 150           | 154    | 138            | 148    | 138-152   | 147  | 7                  |
| Turbidity (F.T.U.)         | 11            | 7      | 9             | 16     | 11             | 13     | 7-16      | 11   | 3                  |
| pH                         | 8.3           | 8.3    | 8.5           | 8.4    | 8.3            | 7.9    | 7.9-8.5   | 8.3  | 0.2                |
| Conductivity (umhos/cm)    | 265           | 265    | 260           | 258    | 265            | 268    | 258-268   | 264  | 4                  |

TABLE 36

## LAKE ERIE WATER QUALITY ANALYSES FOR DECEMBER 1974

 Dates:  
 Field 12-17-74  
 Laboratory 12-17-74

| Parameters                 | Station No. 1 |          | Station No. 8 |          | Station No. 12 |          | Range       | Mean | Standard Deviation |
|----------------------------|---------------|----------|---------------|----------|----------------|----------|-------------|------|--------------------|
|                            | Surface       | Bottom   | Surface       | Bottom   | Surface        | Bottom   |             |      |                    |
|                            | 1115 hrs      | 1115 hrs | 1115 hrs      | 1115 hrs | 1130 hrs       | 1130 hrs |             |      |                    |
| Field Measurements:        |               |          |               |          |                |          |             |      |                    |
| Temperature (°C)           | 0.5           | 0.5      | 0.5           | 0.5      | 0.3            | 0.3      | 0.3-0.5     | 0.4  | 0.1                |
| Dissolved Oxygen (ppm)     | 14.1          | 14.0     | 13.9          | 14.1     | 13.8           | 14.1     | 13.8-14.1   | 14.0 | 0.1                |
| Conductivity (umhos/cm)    | 0.4           |          | 0.4           |          | 0.45           |          | 0.4-0.45    | 0.42 | 0.03               |
| Transparency (m)           |               |          |               |          |                | 2.7      | 1.5-3.9     | 2.7  | 1.2                |
| Depth (m)                  |               | 1.5      |               | 3.9      |                |          |             |      |                    |
| Laboratory Determinations: |               |          |               |          |                |          |             |      |                    |
| Calcium (mg/l)             | 34.4          | 33.6     | 34.4          | 31.2     | 32.0           | 31.2     | 31.2-34.4   | 32.8 | 1.5                |
| Magnesium (mg/l)           | 6.2           | 7.0      | 6.7           | 5.3      | 7.9            | 7.4      | 5.3-7.9     | 6.8  | 0.9                |
| Sodium (mg/l)              | 10.0          | 10.0     | 8.5           | 8.5      | 8.5            | 10.0     | 8.5-10.0    | 9.3  | 0.8                |
| Chloride (mg/l)            | 16.5          | 15.8     | 15.5          | 15.0     | 15.5           | 15.0     | 15.0-16.5   | 15.6 | 0.6                |
| Nitrate (mg/l)             | 2.6           | 2.6      | 3.2           | 3.6      | 2.0            | 2.0      | 2.0-3.6     | 2.7  | 0.6                |
| Sulfate (mg/l)             | 22.0          | 23.0     | 21.0          | 21.0     | 21.5           | 21.5     | 21.0-23.0   | 21.7 | 0.8                |
| Phosphorus (mg/l)          | 0.066         | 0.062    | 0.070         | 0.070    | 0.059          | 0.066    | 0.059-0.070 | 0.07 | 0.0                |
| Silica (mg/l)              | 0.34          | 0.12     | 0.19          | 0.24     | 0.17           | 0.26     | 0.12-0.34   | 0.22 | 0.08               |
| Total Alkalinity (mg/l)    | 92            | 91       | 88            | 87       | 91             | 90       | 87-92       | 90   | 2                  |
| B.O.D. (mg/l)              | 2             | 2        | 1             | 1        | 2              | 2        | 1-2         | 2    | 0.5                |
| Suspended Solids (mg/l)    | 32            | 33       | 17            | 17       | 21             | 23       | 17-33       | 24   | 7                  |
| Dissolved Solids (mg/l)    | 176           | 156      | 164           | 160      | 160            | 164      | 156-176     | 163  | 7                  |
| Turbidity (F.T.U.)         | 24            | 25       | 16            | 16       | 19             | 21       | 16-25       | 20   | 4                  |
| pH                         | 8.3           | 8.3      | 8.4           | 8.3      | 8.4            | 8.4      | 8.3-8.4     | 8.4  | 0.1                |
| Conductivity (umhos/cm)    | 310           | 298      | 280           | 283      | 285            | 285      | 280-310     | 290  | 12                 |

TABLE 37

SOLAR RADIATION IN LAKE ERIE AT LOCUST POINT  
FOR APRIL - OCTOBER 1974<sup>1</sup>

| <u>Date: 25 April 1974 (1215 - 1238 hrs)</u> |                           |                                        |
|----------------------------------------------|---------------------------|----------------------------------------|
| <u>Depth</u>                                 | <u>Photometer Reading</u> | <u>Percent of Surface Illumination</u> |
| 0 m                                          | 6000 u amps               | 100.0%                                 |
| 0.1                                          | 3600                      | 60.0                                   |
| 1.0                                          | 70                        | 11.7                                   |
| 2.0                                          | 0.5                       | 0.1                                    |
| 3.0                                          | 0.0                       | 0.0                                    |
| 4.0                                          | 0.0                       | 0.0                                    |
| <u>Date: 1 June 1974 (1105 - 1225 hrs)</u>   |                           |                                        |
| 0 m                                          | 3200 u amps               | 100.0%                                 |
| 1.0                                          | 325                       | 10.2                                   |
| 2.0                                          | 47.5                      | 1.5                                    |
| 3.0                                          | 8.0                       | 0.2                                    |
| 4.0                                          | 2.0                       | 0.1                                    |
| 4.5                                          | 0.5                       | 0.1                                    |
| <u>Date: 29 June 1974 (0940 - 1020 hrs)</u>  |                           |                                        |
| 0 m                                          | 5400 u amps               | 100.0%                                 |
| 1.0                                          | 600                       | 11.1                                   |
| 2.0                                          | 55                        | 1.0                                    |
| 3.0                                          | 8.75                      | 0.2                                    |
| 4.0                                          | 1.0                       | 0.1                                    |
| <u>Date: 26 July 1974 (1025 - 1055 hrs)</u>  |                           |                                        |
| 0.0 m                                        | 1825 u amp                | 100.0%                                 |
| 0.1                                          | 1325                      | 76.2                                   |
| 1.0                                          | 275                       | 15.1                                   |
| 2.0                                          | 52.5                      | 2.88                                   |
| 3.0                                          | 13.0                      | 0.71                                   |
| 4.0                                          | 3.25                      | 0.18                                   |

TABLE 37 (CON'T.)

SOLAR RADIATION IN LAKE ERIE AT LOCUST POINT  
FOR APRIL - OCTOBER 1974<sup>1</sup>Date: 7 September 1974 (1140 - 1155 hrs)

|       |            |        |
|-------|------------|--------|
| 0.0 m | 6100 u amp | 100.0% |
| 0.1   | 4400       | 72.1   |
| 1.0   | 350        | 5.74   |
| 2.0   | 32.5       | 0.53   |
| 3.0   | 4.0        | 0.06   |
| 4.0   | 0.5        | 0.01   |

Date: 31 October 1974 (1206 - 1216 hrs)

|       |            |        |
|-------|------------|--------|
| 0.0 m | 4100 u amp | 100.0% |
| 1.0   | 1300       | 31.7   |
| 2.0   | 700        | 17.1   |
| 3.0   | 375        | 9.15   |
| 4.0   | 155        | 3.78   |

<sup>1</sup> Photometer readings taken at Station No. 8, 3000 feet offshore  
at intake structure

TABLE 38  
CURRENT MEASUREMENTS IN LAKE ERIE AR LOCUST POINT  
FOR MAY - OCTOBER 1974

| Date/Time     | Station No. | Velocity (knots) | Direction (compass °) |
|---------------|-------------|------------------|-----------------------|
| 5-24-74/1100  | 12          | 0.30             | 135°-225°             |
| 5-24-74/1115  | 12          | 0.25             | 180°                  |
| 6-21-74/1045  | 12          | 0.30             | 180°                  |
| 6-21-74/1055  | 12          | 0.20-0.40        | 150°-180°             |
| 6-21-74/1105  | 12          | 0.33             | 160°                  |
| 6-21-74/1150  | 8           | 0.80             | 45°                   |
| 7-18-74/1200  | 8           | 0.24             | 58°                   |
| 7-18-74/1200  | 12          | 0.21             | 80°                   |
| 8-16-74/1200  | 8           | 0.19             | 350°                  |
| 8-16-74/1200  | 12          | 0.18             | 355°                  |
| 9-12-74/1200  | 8           | 0.12             | 55°                   |
| 9-12-74/1200  | 12          | 0.14             | 25°                   |
| 10-17-74/1200 | 8           | 0.29             | 130°                  |
| 10-17-74/1200 | 12          | *                |                       |

\* rough conditions

TABLE 39  
MEAN VALUES AND RANGES FOR WATER QUALITY PARAMETERS  
TESTED IN 1974

| Parameter                | April - June 1974 |             | July - December 1974 |                    |
|--------------------------|-------------------|-------------|----------------------|--------------------|
|                          | Mean              | Range       | Mean                 | Range              |
| 1) Temperature           | 14.0              | 7.7 - 20.0  | 14.9                 | 0.3-25.4°C         |
| 2) Dissolved Oxygen      | 10.5              | 8.0 - 13.2  | 9.9                  | 5.7 - 14.1 ppm     |
| 3) Conductivity          | 309               | 275 - 360   | 274                  | 220 - 325 umhos/cm |
| 4) Transparency          | 0.26              | 0.1 - 0.6   | 0.45                 | 0.30 - 0.60 m      |
| 5) Calcium               | 40.0              | 34.0 - 50.8 | 35.5                 | 31.2 - 40.4 mg/l   |
| 6) Magnesium             | 7.4               | 5.0 - 11.0  | 7.1                  | 4.8 - 8.9 mg/l     |
| 7) Sodium                | 11.1              | 7.0 - 15.0  | 10.4                 | 8.5 - 15.3 mg/l    |
| 8) Chloride              | 19.7              | 17.6 - 26.0 | 16.7                 | 12.4 - 21.0 mg/l   |
| 9) Nitrate               | 0.69              | 0.0 - 2.4   | 0.45                 | 0.0 - 5.1 mg/l     |
| 10) Sulfate              | 34.1              | 28.0 - 45.5 | 24.7                 | 21.0 - 32.0 mg/l   |
| 11) Phosphorus           | 0.16              | 0.04 - 0.44 | 0.04                 | 0.00 - 0.07 mg/l   |
| 12) Silica               | 1.26              | 0.11 - 3.83 | 0.31                 | 0.04 - 0.99 mg/l   |
| 13) Total Alkalinity     | 94                | 90 - 100    | 92                   | 86 - 96 mg/l       |
| 14) BOD                  | 2.0               | 0.5 - 4.72  | 2.6                  | 1 - 4 mg/l         |
| 15) Suspended Solids     | 39.3              | 8 - 109     | 21.5                 | 9 - 42 mg/l        |
| 16) Dissolved Solids     | 18000             | 86 - 396    | 177                  | 138 - 258 mg/l     |
| 17) Turbidity            | 47                | 9 - 120     | 11                   | 4 - 25 F.T.U.      |
| 18) Hydrogen-ions        | 8.0               | 7.3 - 8.6   | 8.4                  | 7.8 - 9.0 pH       |
| 19) Solar Radiation (1m) | 332               | 70 - 600    | 642                  | 275 - 1300 u amps  |
| 20) Currents (speed)     | 0.37              | 0.20 - 0.80 | 2.0                  | 0.12 - 0.29 knots  |

FIGURE 2. MEAN MONTHLY PHYTOPLANKTON POPULATIONS FOR LAKE ERIE AT LOCUST POINT - 1974.

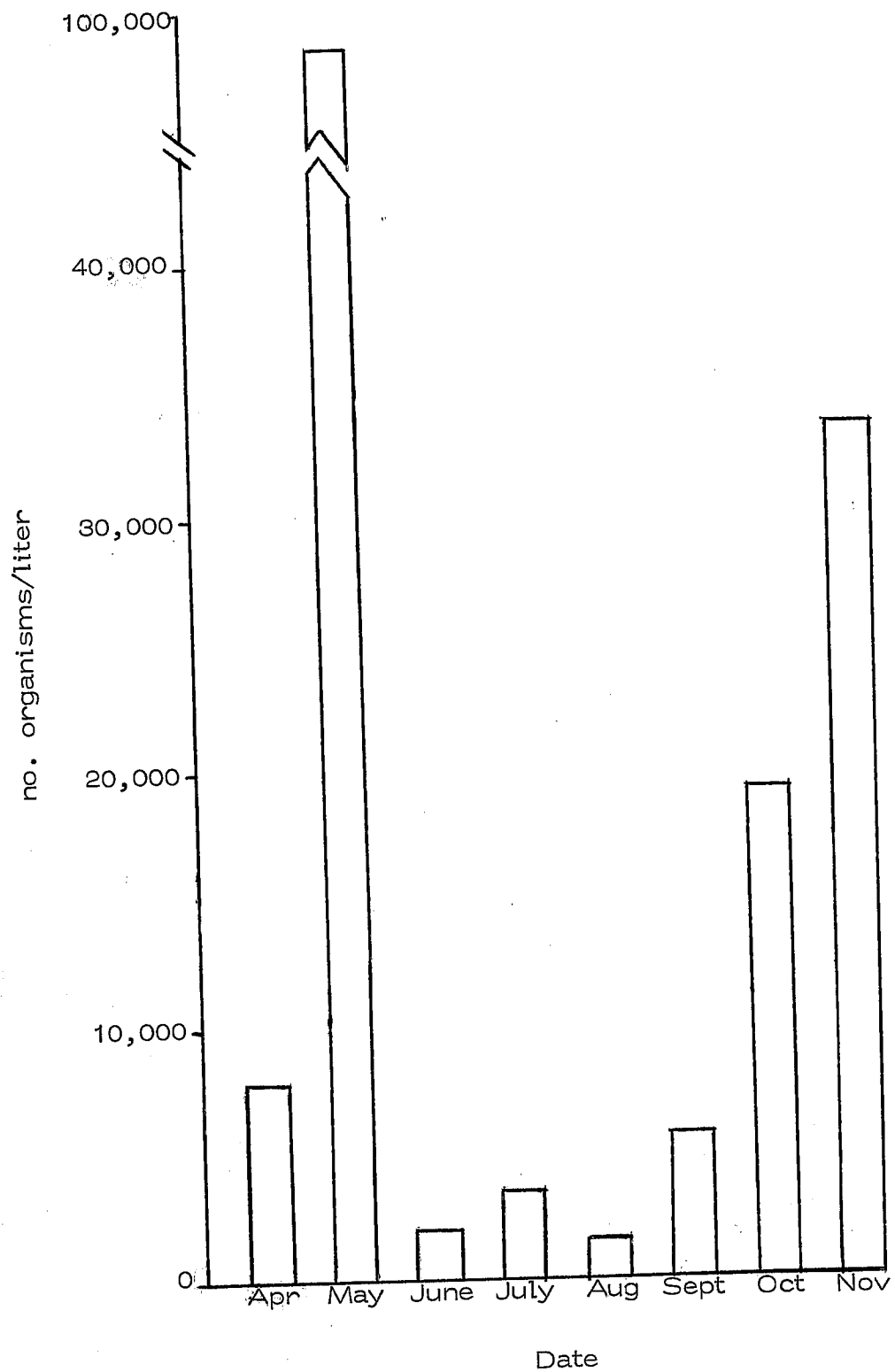
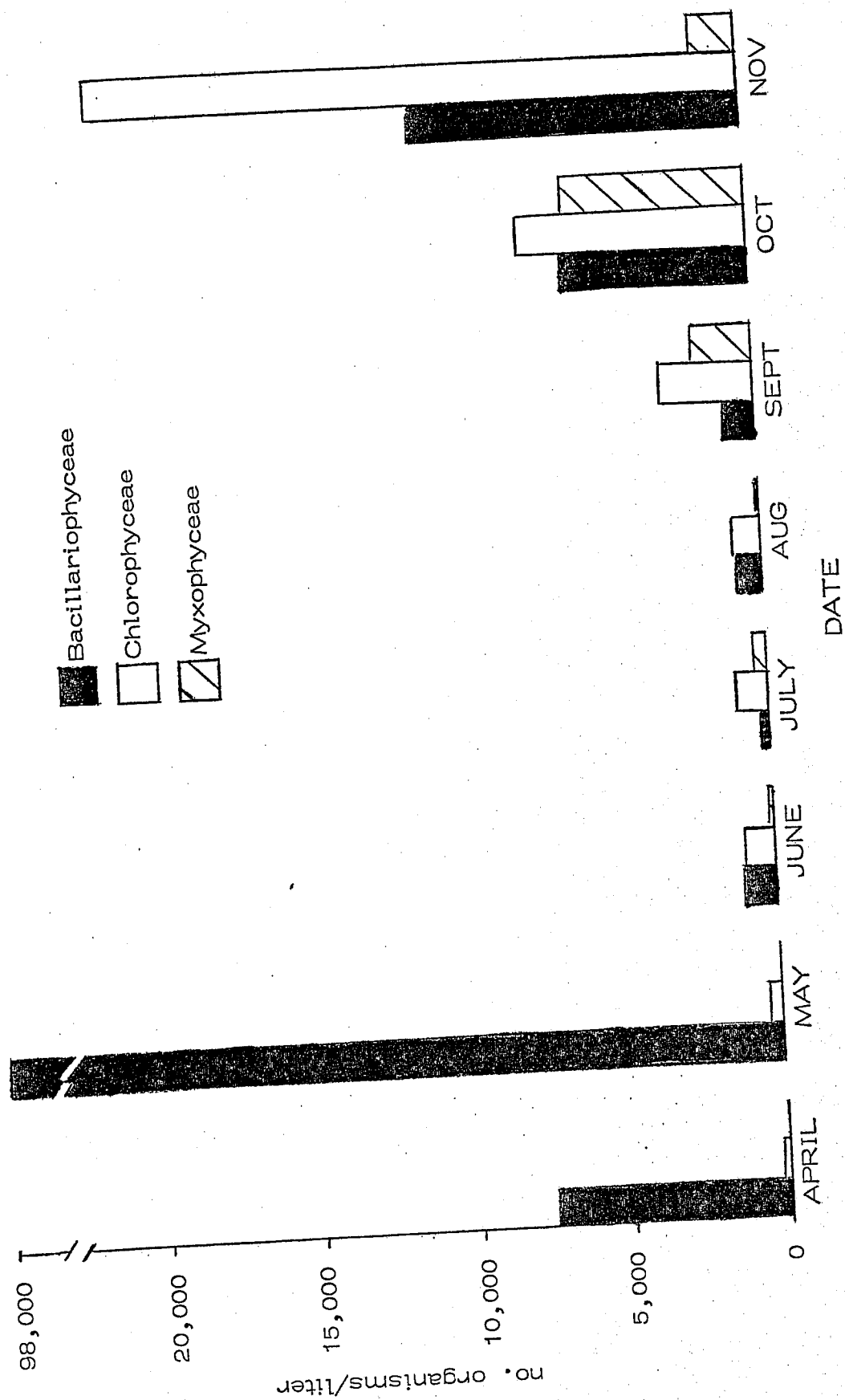


FIGURE 3. MEAN MONTHLY BACILLARIOPHYCEAE, CHLOROPHYCEAE, AND MYXOPHYCEAE POPULATIONS FOR LAKE ERIE AT LOCUST POINT - 1974.



There was some room for interpretation in the identification of several taxa. What we have called Closteriopsis sp., some algologists identify as Closterium gracile while others identify it as Closterium aciculare var. subpronum. It was also often difficult to distinguish Binuclearia sp. from Mougeotia sp. Starting in September, a recent taxonomical change was incorporated into the results. One of the species of Melosira, Melosira binderana, is now called Stephanodiscus binneranus and, therefore, was placed under Stephanodiscus sp. When using this data, one must also realize that some of the very small forms such as Chlorella sp. may have passed through the sampling equipment.

Zooplankton. The zooplankton populations rose through July and then, with the exception of a very low August value, decreased steadily through November (Fig. 4). The populations from 1972 also peaked during the summer, August, but at a level 300 organisms per liter below that observed in 1974 (Hair and Herdendorf, 1973). Populations computed during 1973 on this project peaked in June, but at half the 1974 maximum and 360 organisms per liter below the 1972 maximum. The 1974 values approached a bell-shaped curve more than 1972 or 1973 populations.

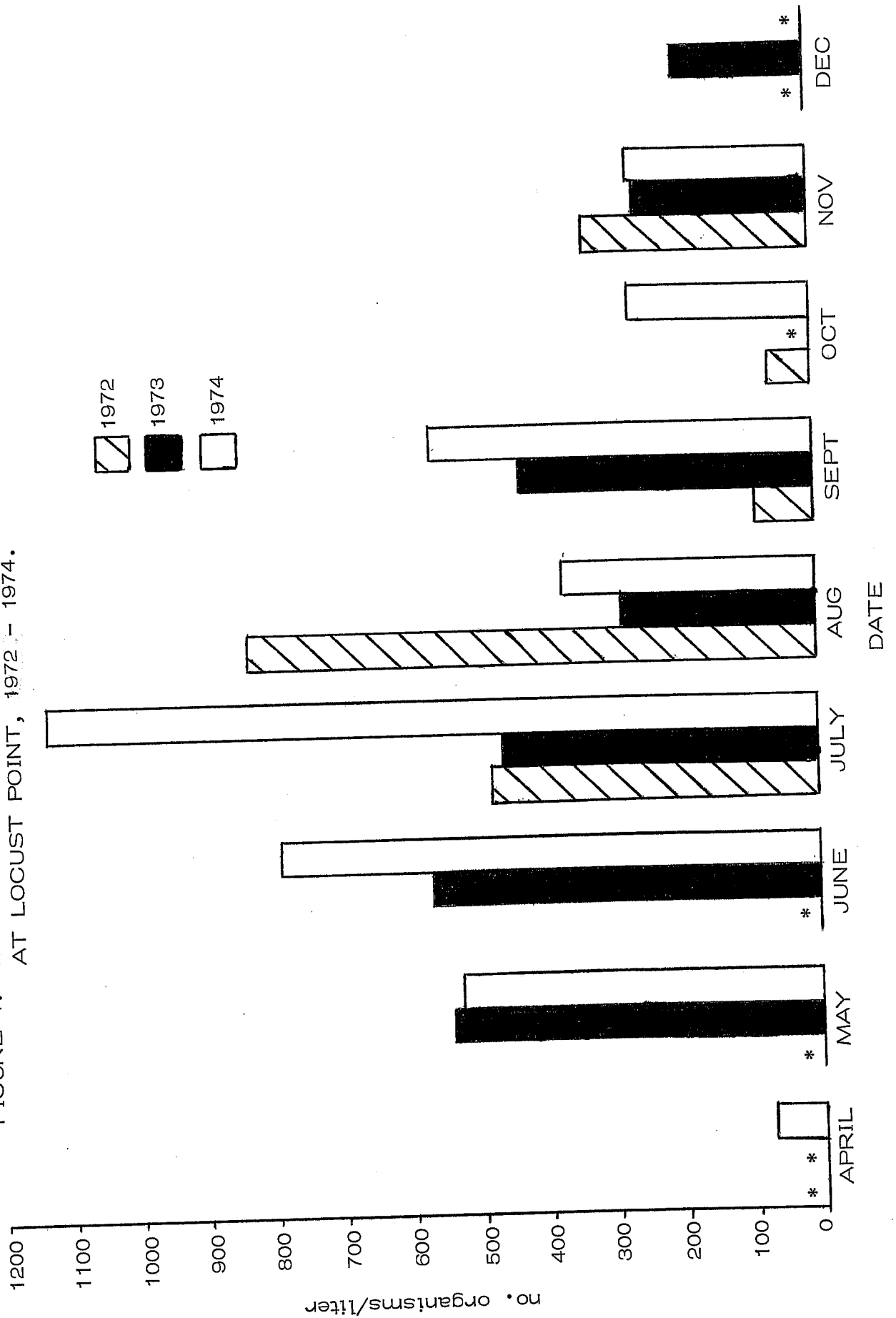
The rotifer populations were the largest of the major groups and showed the greatest variation over the 3 year period (Fig. 5). In 1972 and 1974 the peaks occurred in the same month as the total zooplankton peaks occurred. In 1973 the rotifer peak occurred one month earlier, in May, than the total zooplankton peak.

The copepod populations from the 3 years were very similar (Fig. 6). In 1973 and 1974 the peaks were in June. In 1972 the highest population occurred in July. However, no sampling had been done in June 1972, so the peak may have been missed.

Generally the cladocerans had the lowest populations of the 3 groups (Fig. 7). The 1973 populations were the lowest of the 3 years. The 1972 and 1974 populations were very similar.

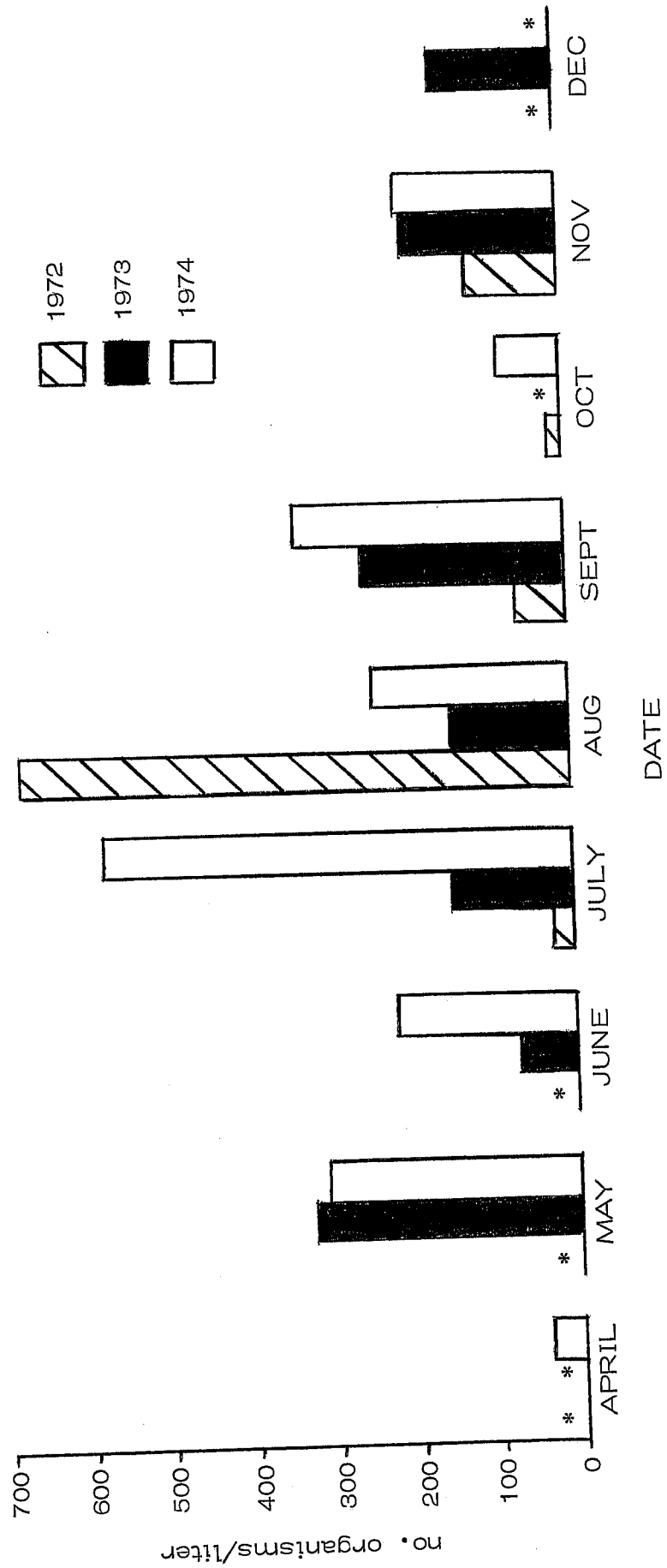
There are several plausible explanations for the differences described above. Samples in 1972 were collected with a 3-liter Kemmerer water bottle at the surface. In 1973 and 1974 samples were collected by a vertical tow bottom to surface with a Wisconsin plankton net. A brief comparison study in 1973 showed that the vertical tow captured approximately 50 percent more taxa. The stations sampled over the 3 years were similar but not the same. In 1973 the intake and discharge pipelines were being dredged, and in 1972 tropical storm Agnes affected the weather. Also, due to the weather, samples were not collected on the same day of the month each year.

FIGURE 4. MEAN MONTHLY ZOOPLANKTON POPULATIONS FOR LAKE ERIE  
AT LOCUST POINT, 1972 - 1974.



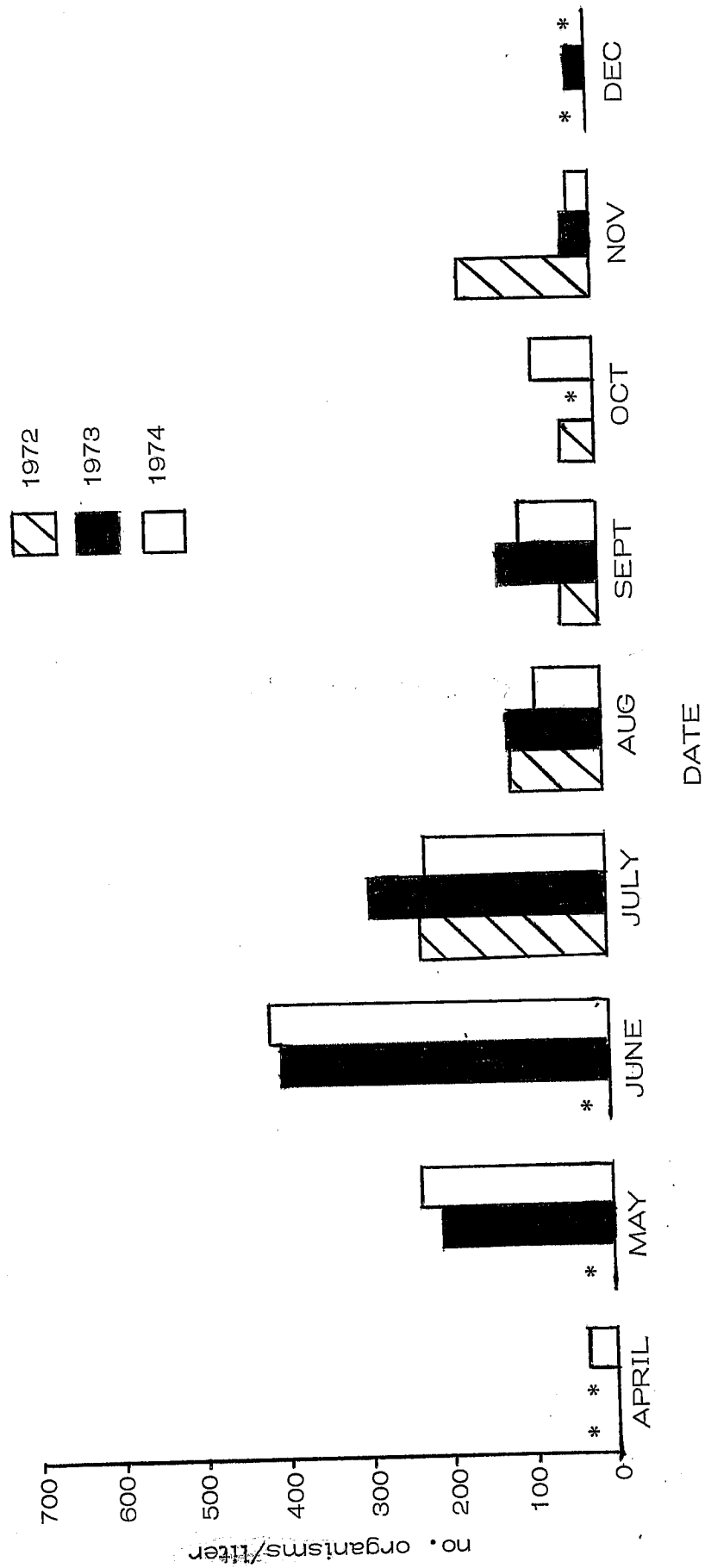
\* No samples were collected.

FIGURE 5. MEAN MONTHLY ROTIFER POPULATIONS FOR LAKE ERIE  
AT LOCUST POINT, 1972 - 1974.



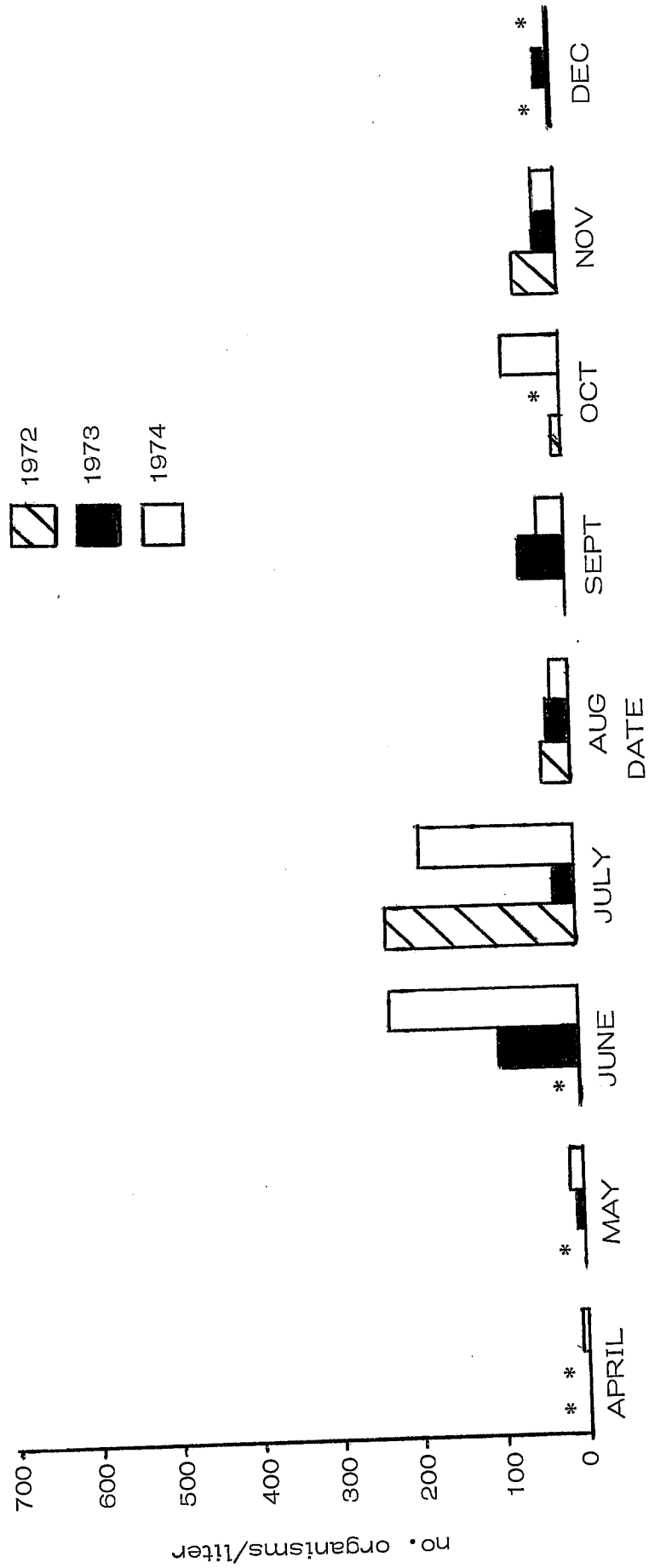
\* No samples were collected.

FIGURE 6. MEAN MONTHLY COPEPOD POPULATIONS FOR LAKE ERIE  
AT LOCUST POINT, 1972 - 1974.



\* No samples were collected.

FIGURE 7. MEAN MONTHLY CLADOCERAN POPULATIONS FOR LAKE ERIE  
AT LOCUST POINT, 1972 - 1974.



\* No samples were collected.

and were not spaced exactly one month apart. Finally, these samples were collected monthly, and Hubschman (1960) pointed out the tremendous differences which occurred when samples collected every Monday were compared to samples collected every Tuesday. However, monthly samples give an overview and, when done repetitively over a series of years, provide a relatively strong base for predicting trends.

During 6 of the 8 months that were sampled in 1974, the highest populations were found at stations closest to shore. This indicates that the zooplankton populations were probably concentrating at the surface. Thus, at the deeper stations this surface sample would be diluted by the bottom waters of the vertical tow.

Overall, no populations which could be considered unusual have occurred from 1972 - 1974. The populations of 1974 are probably more representative of a "typical" year, since dredging and storms undoubtedly affected the 1972 and 1973 populations. The data from these years show the magnitude of natural variability in zooplankton populations prior to operation of the power station.

There are always many difficulties involved in the identification of zooplankton. These are compounded when the organisms are preserved. It was especially difficult to identify the soft bodied rotifers. It was often difficult to distinguish between Pompholyx sp., Chromogaster ovalis, and rotifer eggs.

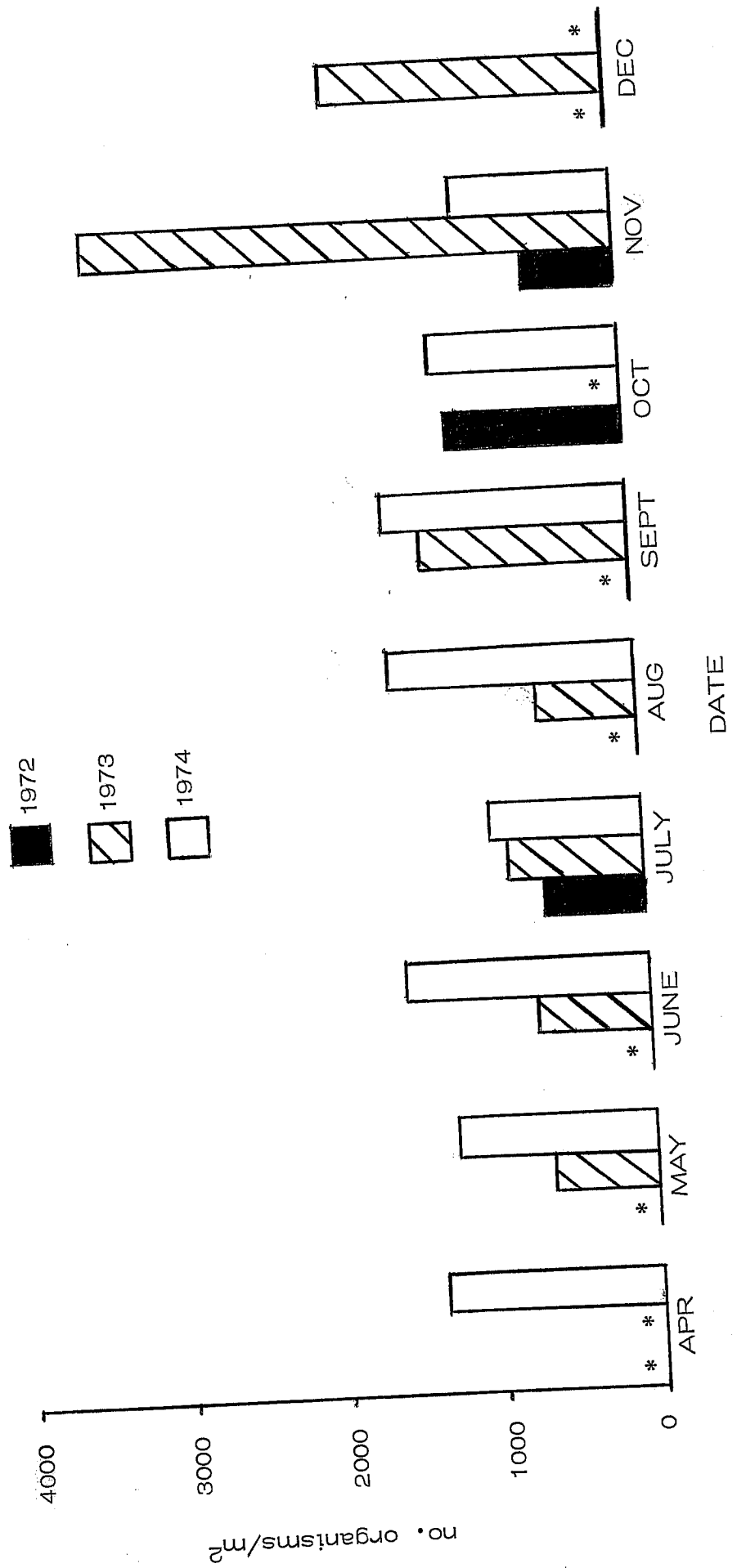
### Benthos

Mean monthly benthic macroinvertebrate populations were relatively stable in 1974 (Fig. 8). With the exception of July, they were slightly higher during the summer months, and, with the exception of November and possibly December, they were higher than those observed in 1972 and 1973. This in itself was a good indication that recolonization after dredging the intake and discharge pipelines was successful.

The monthly populations were dominated by immature oligochaetes (no hair setae) (Table 7). The only other taxa to occur in large numbers were Leptodora kindtii, Chironomus (chironomus) sp., and Tanytarsus sp. Although the populations were dominated by these four taxa, the other taxa may be more important as indicators of community change since species at the fringe of their tolerance will reflect changes in the environment first.

Oligochaetes (sludge worms) are often used as pollution indicators. However, in this case, they probably indicate an unstable

FIGURE 8. MEAN MONTHLY BENTHIC MACROINVERTEBRATE POPULATIONS FOR LAKE ERIE AT LOCUST POINT, 1972 - 1974.



\* No samples were collected.

environment rather than organically polluted (sewage) water. Dredging the intake and discharge pipelines only added to the turbidity and shifting bottom material already present. To survive in this environment an organism must be able to burrow out when it becomes buried. Hence, a population dominated by oligochaetes and chironomids prevailed.

Again, as in 1972 and 1973, a tendency of increasing populations with distance off shore was noted (Fig. 9). The greatest increase occurred when going from 500 to 1000 ft. Once 1000 ft off shore there was little change in populations along the control west and intake transects as one progressed to the end. However, a tremendous increase was noted on the discharge transect at Station 14, 3000 ft off shore. Populations at Stations 12 and 13, 1500 and 2000 ft off shore, respectively, were probably inhibited due to dredging activities. The same thing, although to a lesser degree, was noted at Stations 7 and 8, 2000 ft and 3000 ft off shore, respectively, along the intake transect.

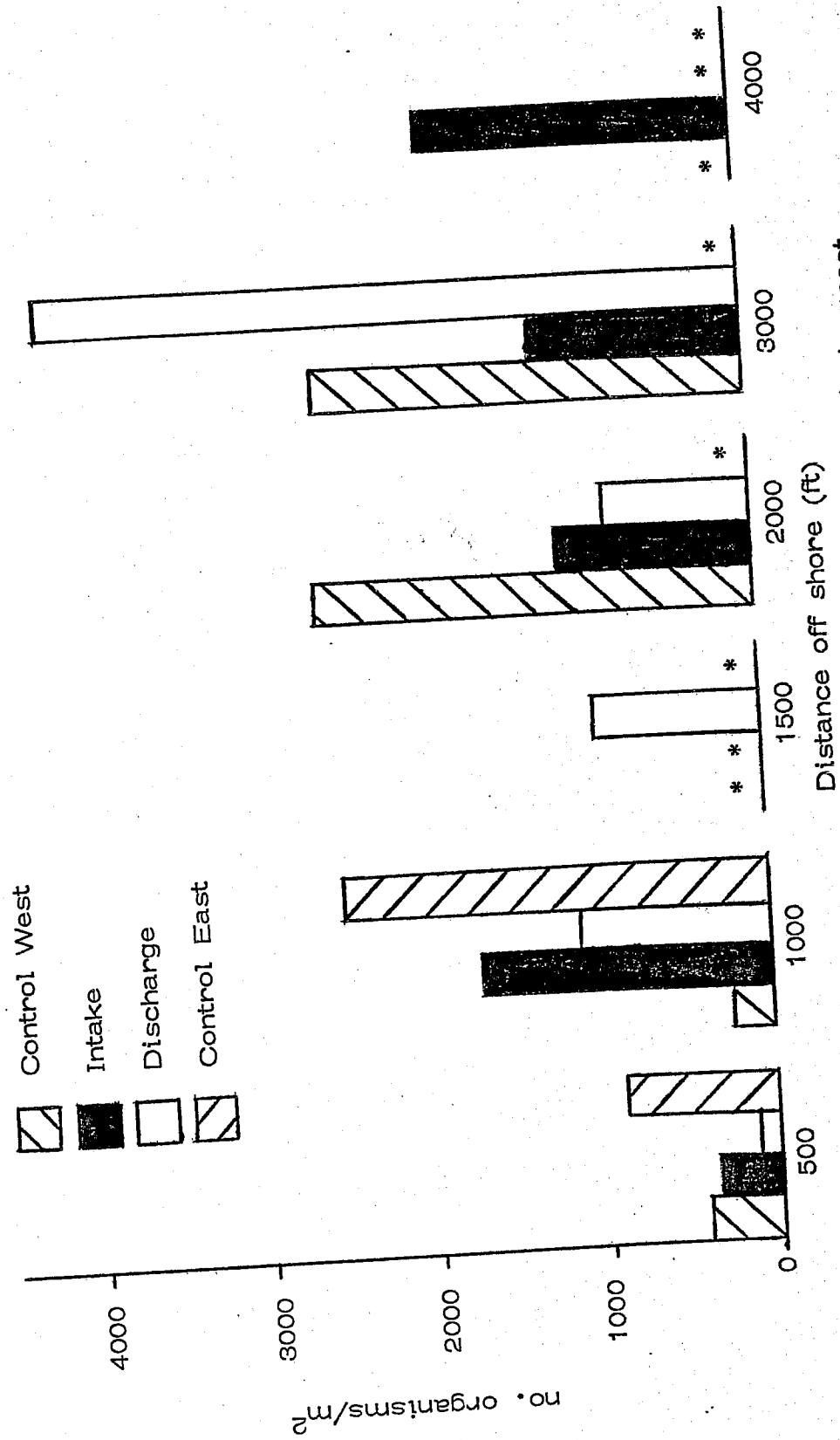
As with the plankton, nothing out of the ordinary for western Lake Erie was observed in the benthos results during the past three years.

### Fish

In 1973, 5300 fish were captured for the monitoring program. During the first half of 1974, 6,090 fish were captured. From July through November an additional 25,315 fish were captured for a total of 31,405 during 1974. The major reasons for this tremendous increase are increased sampling effort and ideal sampling conditions. In 1973, no fry netting was done, gill netting and trawling were accomplished on 5 dates instead of 8 as in 1974, fishing in the marsh was done only once, and shore seining was done 4 times and only once from Station 24 where the catch in 1974 was greatest. In 1973, foul weather conditions often forced us off the lake, while in 1974 we were fortunate to have had no serious setbacks due to weather conditions. Comparisons with 1972 data are difficult due to different sampling techniques.

Although the total number of fish captured increased, the number of predators (sport fish) decreased (fry excluded). Yellow perch (Perca flavescens) show this trend quite well. In 1973, 812 perch were captured using gill nets. In 1974, with 3 more sampling dates, only 345 perch were captured. In 1973, trawling yielded 170 perch. In 1974, again with 3 more sampling dates, 82 perch were captured and 60 of these were young-of-the-year.

FIGURE 9. MEAN BENTHIC MACROINVERTEBRATE POPULATIONS AT VARIOUS DISTANCES OFF SHORE ALONG THE FOUR SAMPLING TRANSECTS - 1974.



Meanwhile, the numbers of forage species have increased. It is possible that this increase in the forage fish population was brought about by the decrease in the predator population. However, the cause of the low predator populations is not known at this time. It is extremely important to note natural fluctuations of this type prior to discharge so that any fluctuations which may occur after the plant goes into operation are not blamed solely on the power plant.

The number of fish captured at Station 8 and 12 (intake and discharge) with gill nets was strikingly similar in both 1973 and 1974. In 1973, 1,262 fish were caught at Station 8 and 1,334 at Station 12. In 1974, 2,570 fish were taken at Station 8 and 2,554 at Station 12.

Shore seining revealed Station 24 to be the most populous station (Tables 13 - 20). This was undoubtedly due to the outlet of the marsh control pump being in the vicinity. This should be a warm, nutrient-rich flow. Bits of fish have also been observed in this outflow.

Trawling in the intake canal after it had been poisoned indicated a complete kill had occurred (Table 22). "Noxfish", the commercial toxicant used, was observed to kill carp relatively soon after it was applied. Therefore, the carp captured in October must have come into the canal through the intake pipeline. The entire benthic macroinvertebrate population was destroyed in the process as evidenced by the low population in October and nothing at all in November (Table 8).

July was the last month in which significant numbers of fry were captured (Table 26). However, even the largest value was less than one third of that observed commonly at Sandusky Bay.

### Food Habits

The most significant realization from this portion of the study was the importance of crustaceans as food items. Even more interesting was the abundance of Daphnia pulex in the stomachs compared to D. retrocurva since D. pulex was much less abundant in the plankton populations than D. retrocurva. Perch, walleyes, and white bass were the only fish observed to feed on smaller fish.

## Water Quality

Seasonal Variations. The water quality in the vicinity of the Davis-Besse Nuclear Power Station during the period of April through December 1974 was typical for western Lake Erie and showed normal seasonal trends. Water temperature fell from 25.4°C in July and August to 0.3°C in December while dissolved oxygen rose 7 ppm to 14.1 ppm in December (Fig. 10). The high turbulence and sediment load of the lake in early spring improved during the summer as indicated by a 6-fold increase in transparency, a 6-fold decrease in suspended solids, a 6-fold decrease in turbidity and an 8-fold increase in the amount of solar radiation at 1-meter below the surface (Fig. 11). Some decrease in water clarity was noted in the fall and early winter. Biochemical oxygen demand, which is related to the suspended organic material in the water, also showed a marked improvement in the bottom water from April to December.

In a like manner the dissolved substances in the water were highest in the April samples; both conductivity and total dissolved solids showed a significant decrease between April and May but remained fairly stable through the rest of the year (Fig. 12). Specific ions such as calcium and sulfate were also highest in April, whereas other ions such as magnesium, sodium and chloride were fairly stable throughout the year (Fig. 13). The important nutrients, such as nitrate, phosphate and silica, for primary productivity by green algae and diatoms had a peak in the spring and decreased markedly during the summer (Fig. 14). Silica, for example, had a 30-fold decrease in concentration between April and May. Because diatoms utilize silica for their rigid cell walls, the decrease of this substance in the water may be related to the spring pulse of the organisms which is also shown on Figure 14. Nitrate showed a build-up in the fall which may have resulted in the increased algal population during that season (Fig. 14).

The alkalinity and pH of the water remained fairly constant throughout the period (Figs. 10 and 12). Lake Erie is primarily a bicarbonate solution with a corresponding moderately alkaline pH of approximately 8. The bicarbonate in the water provides an abundant source of carbon for algae production. The pH showed a slight rise in May and October which may correspond with the algae pulses.

Station Variations. Stations 1, 8 and 12 are located approximately 500, 3,000 and 1,500 feet offshore respectively. Generally a slight temperature decrease was noted in an offshore direction in the spring. More noticeable decreases were found for such parameters as conductivity, most of the specific ions, alkalinity, B.O.D., suspended

FIGURE 10. MEAN MONTHLY HYDROGEN ION, TEMPERATURE AND DISSOLVED OXYGEN MEASUREMENTS FOR LAKE ERIE AT LOCUST POINT DURING 1974.

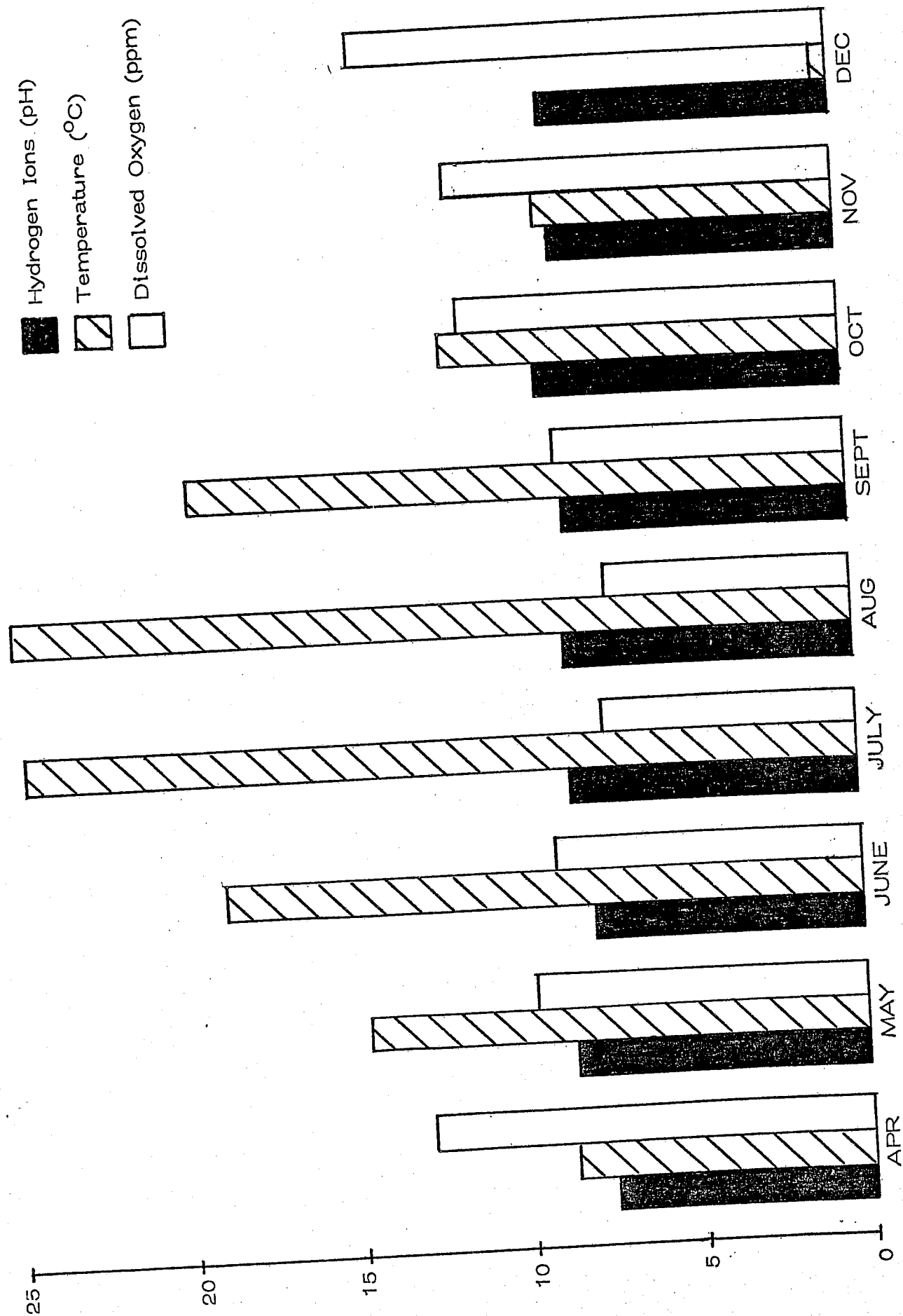


FIGURE 11.

MEAN MONTHLY TURBIDITY, SUSPENDED SOLIDS AND TRANSPARENCY MEASUREMENTS FOR LAKE ERIE AT LOCUST POINT DURING 1974.

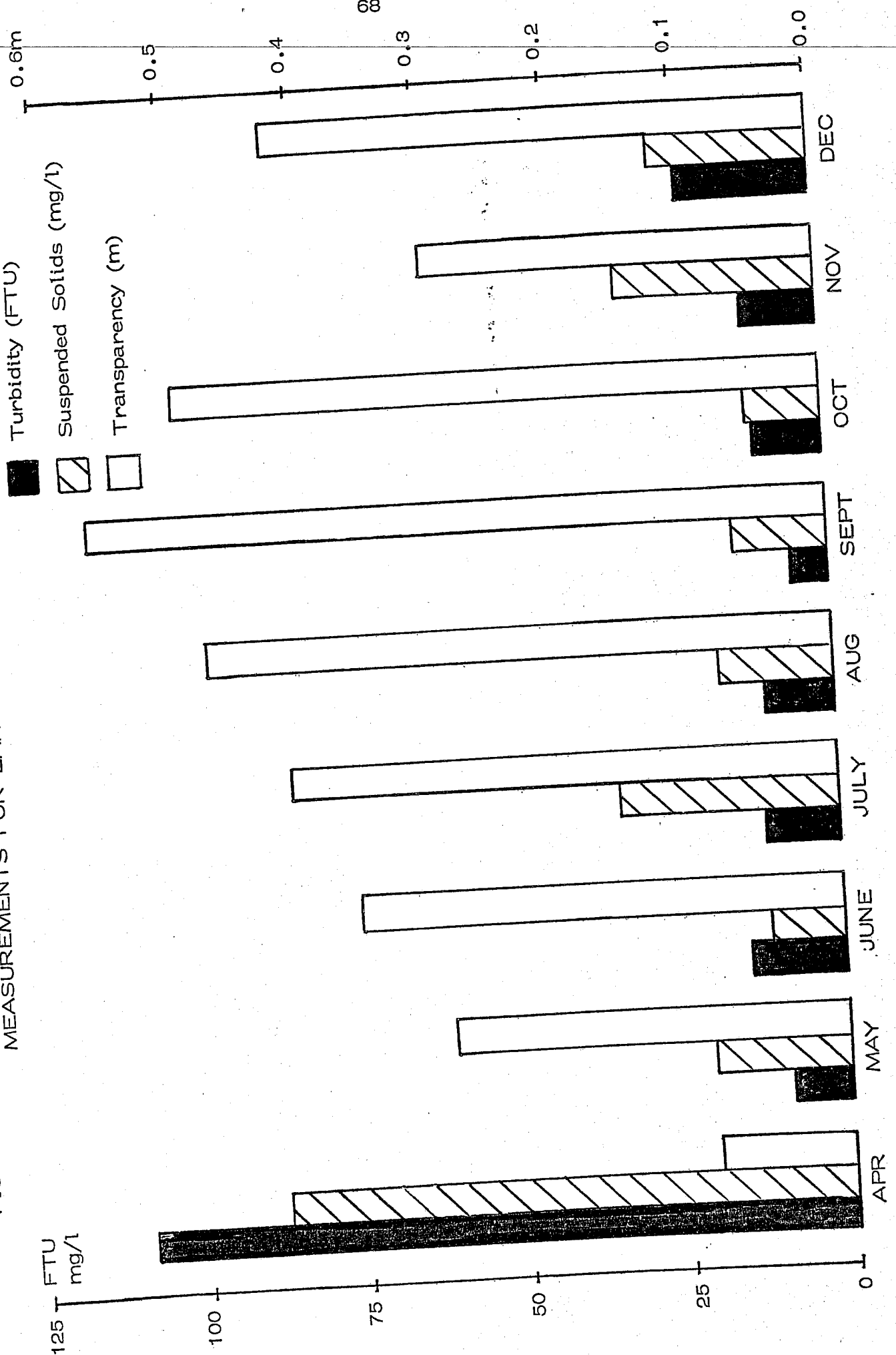


FIGURE 12. MEAN MONTHLY ALKALINITY, DISSOLVED SOLIDS AND CONDUCTIVITY MEASUREMENTS FOR LAKE ERIE AT LOCUST POINT DURING 1974.

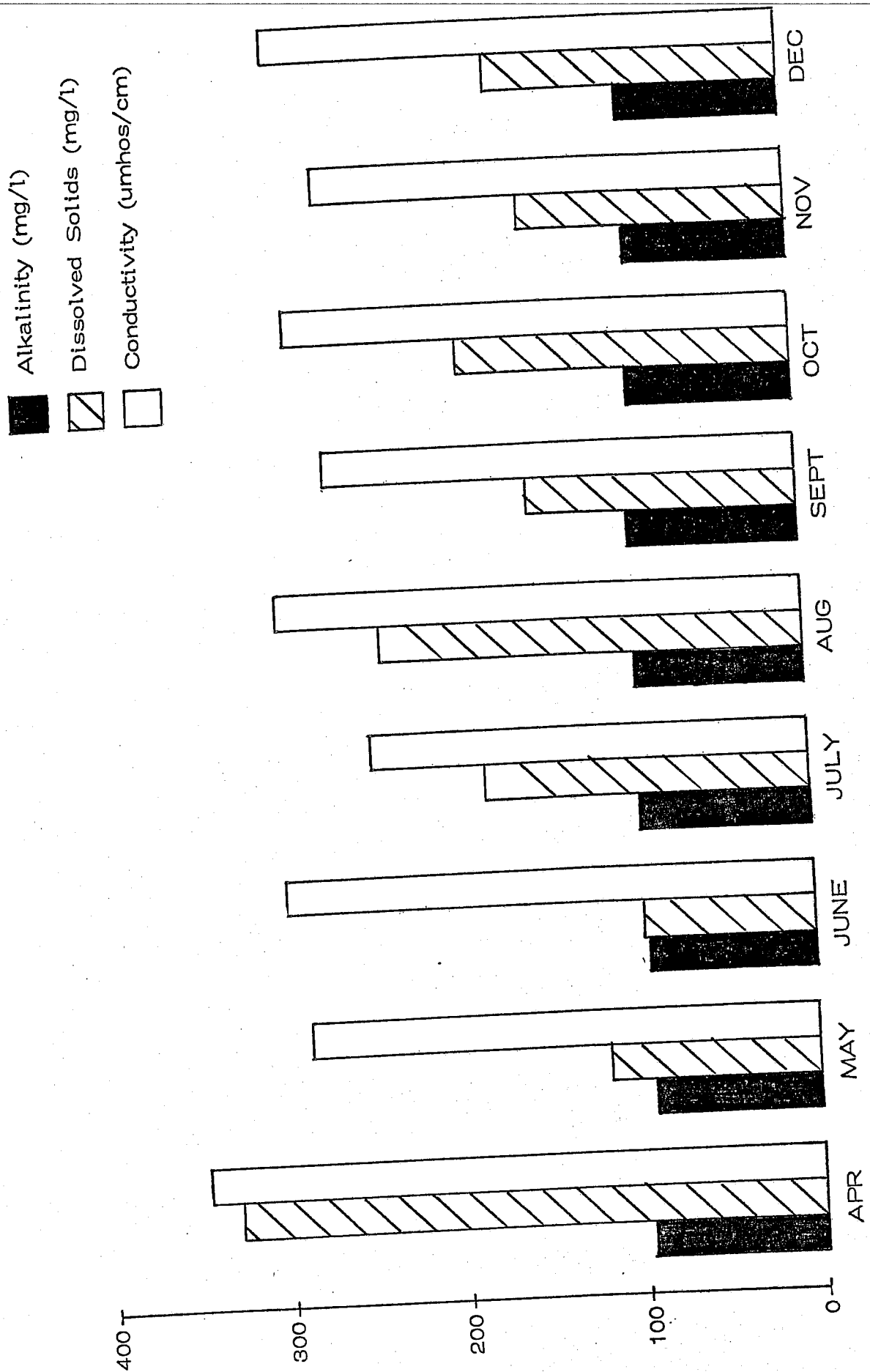


FIGURE 13. MEAN MONTHLY CALCIUM, CHLORIDE AND SULFATE CONCENTRATIONS IN LAKE ERIE AT LOCUST POINT DURING 1974.

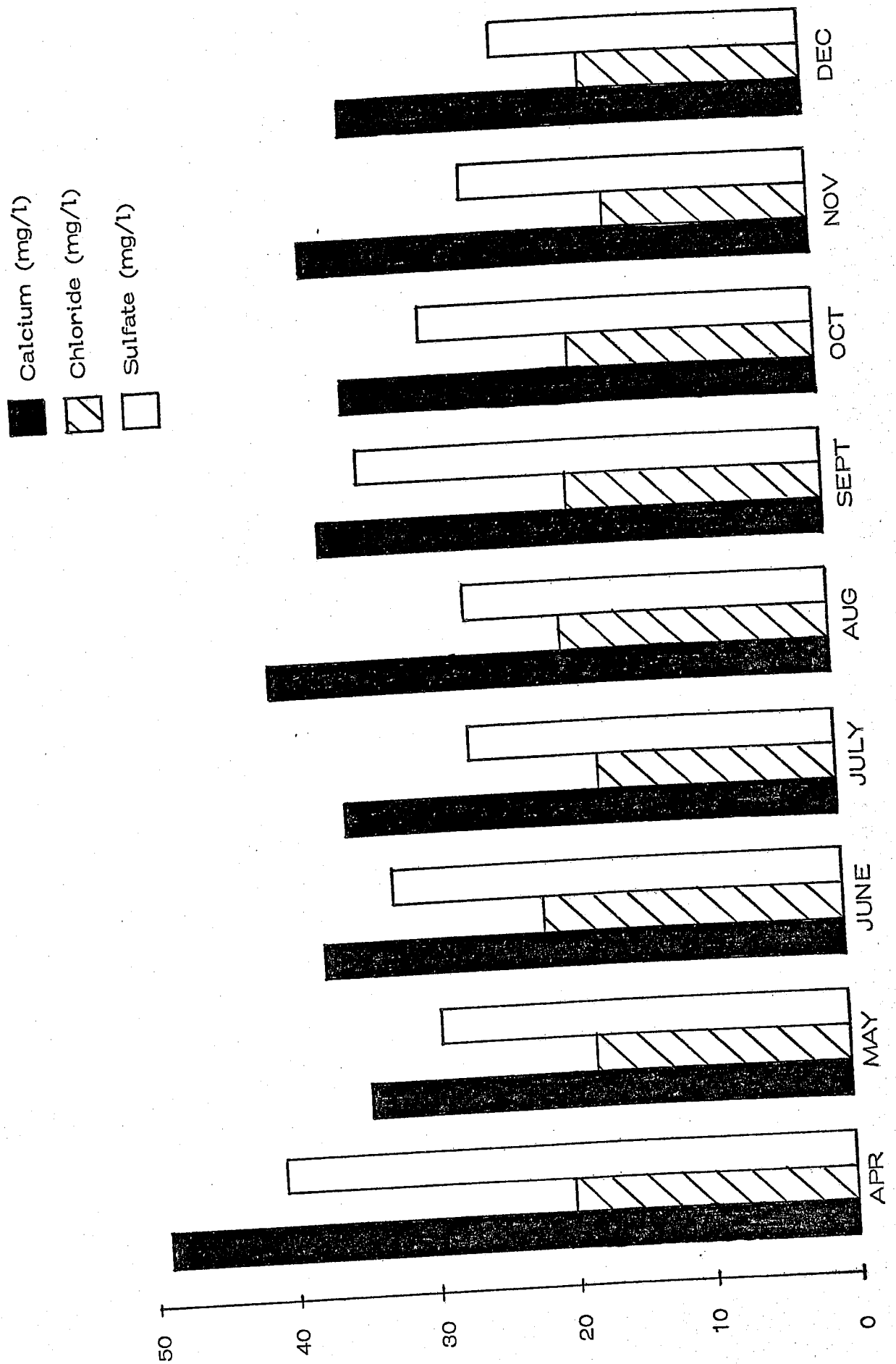
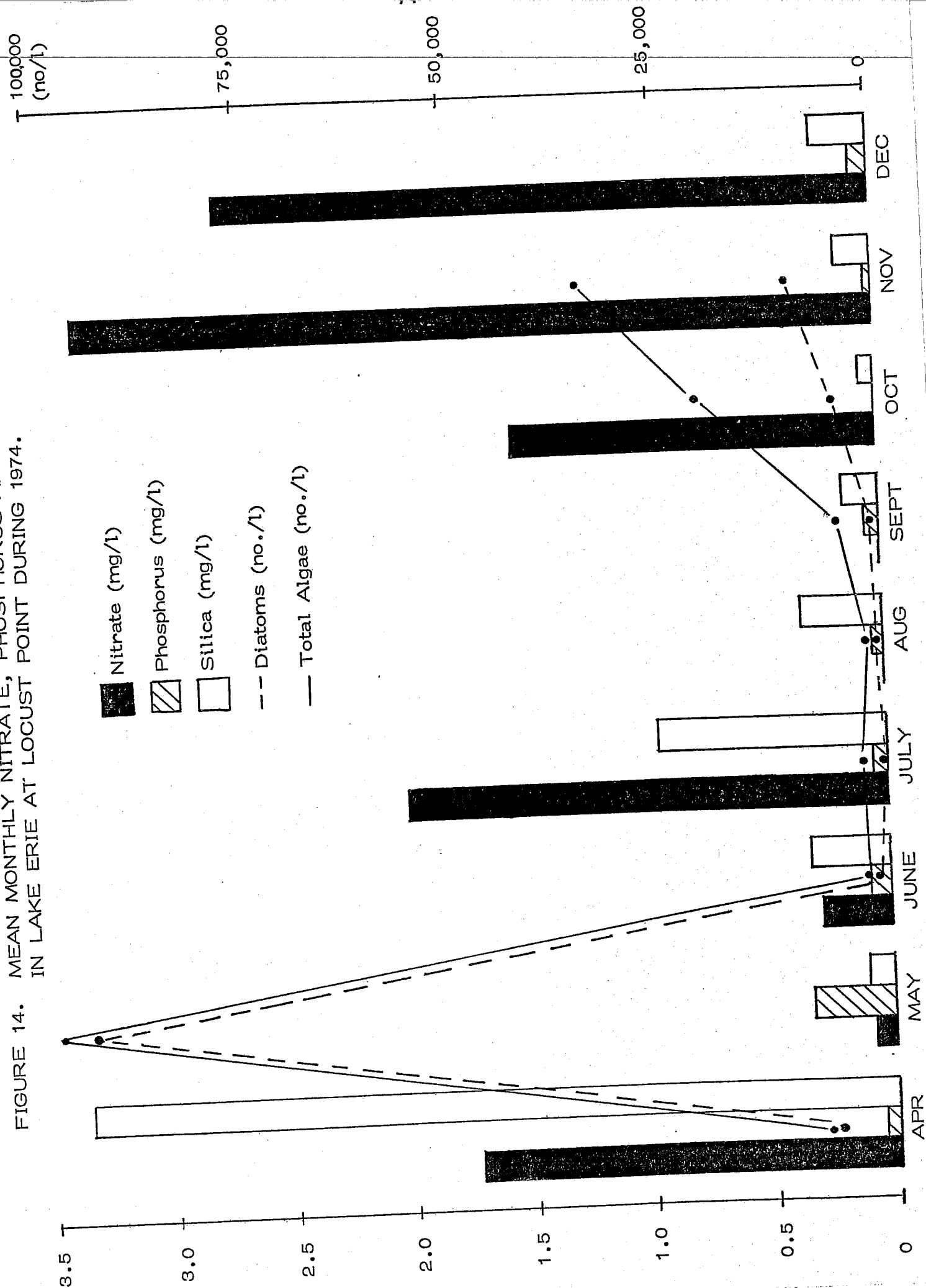


FIGURE 14. MEAN MONTHLY NITRATE, PHOSPHORUS AND SILICA CONCENTRATIONS IN LAKE ERIE AT LOCUST POINT DURING 1974.



and dissolved solids, and turbidity in the early part of the year. Conversely, transparency increases away from the shore. Although Station 8 (the farthest offshore) had the best water quality, Station 12 (intermediate offshore) had the poorest quality for some parameters. This may be related to the condition of the lake bottom. Station 1 (nearshore) has a clean sand bottom whereas Station 12 has a recently disturbed mud bottom and is down current from the disturbed bottom along the intake pipeline. The differential in water quality values was greatest in the spring which may have been related to rough weather and leveling attempts along the pipelines. During the summer and fall no significant difference was found between the inshore and offshore stations.

Differences between the surface and bottom water quality were slight because of the shallowness of this portion of Lake Erie. Some depression in the level of dissolved oxygen and small increases in the concentrations of dissolved and suspended solids were noted near the bottom.

Water Quality Trends. The Ohio State University, Center for Lake Erie Area Research initiated water quality studies at Locust Point in July 1972. Trends for eight water quality parameters from that date through December 1974 are shown on Figures 15 - 17. Temperature and dissolved oxygen show typical seasonal trends for each year with only minor variations from one year to the next. Dissolved oxygen appears to have undergone more depletion in 1974 than the two previous years. Hydrogen-ion concentration and alkalinity remained fairly stable over the three-year period. Transparency, turbidity, phosphorus and conductivity values have shown radical variations which are probably due to storms and dredging activities that have disturbed the bottom sediments. In general, no significant deviations from the normal quality of the water in this part of western Lake Erie have been observed in the past three years.

## STUDY RECOMMENDATIONS

The monitoring program should be continued until the plant is operational and for a time afterwards to determine the complete effect of the plant on the aquatic ecosystem. A thorough knowledge of these effects will be invaluable in the siting and design of future power plants and will greatly reduce the chance of natural catastrophes due to Units 2 and 3 of this power plant. The program should be expanded after the plant is in operation to better monitor the movements of the fish in and around the thermal plume.

FIGURE 15. TRENDS IN MEAN MONTHLY TEMPERATURE, DISSOLVED OXYGEN, AND HYDROGEN IONS MEASUREMENTS FOR LAKE ERIE AT LOCUST POINT FOR THE PERIOD 1972 - 1974.

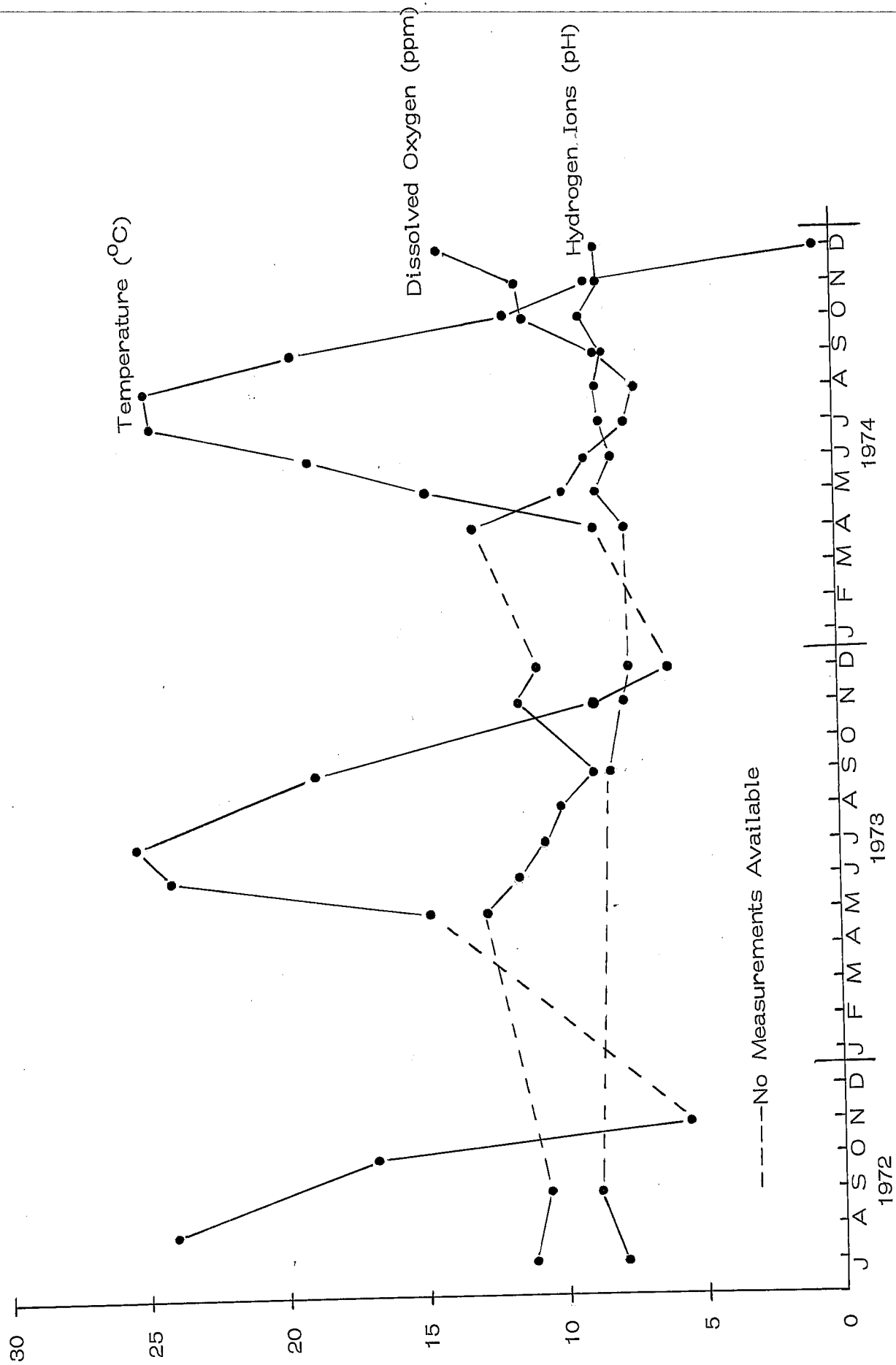


FIGURE 16. TRENDS IN MEAN MONTHLY TRANSPARENCY AND PHOSPHORUS MEASUREMENTS FOR LAKE ERIE AT LOCUST POINT FOR THE PERIOD 1972 - 1974.

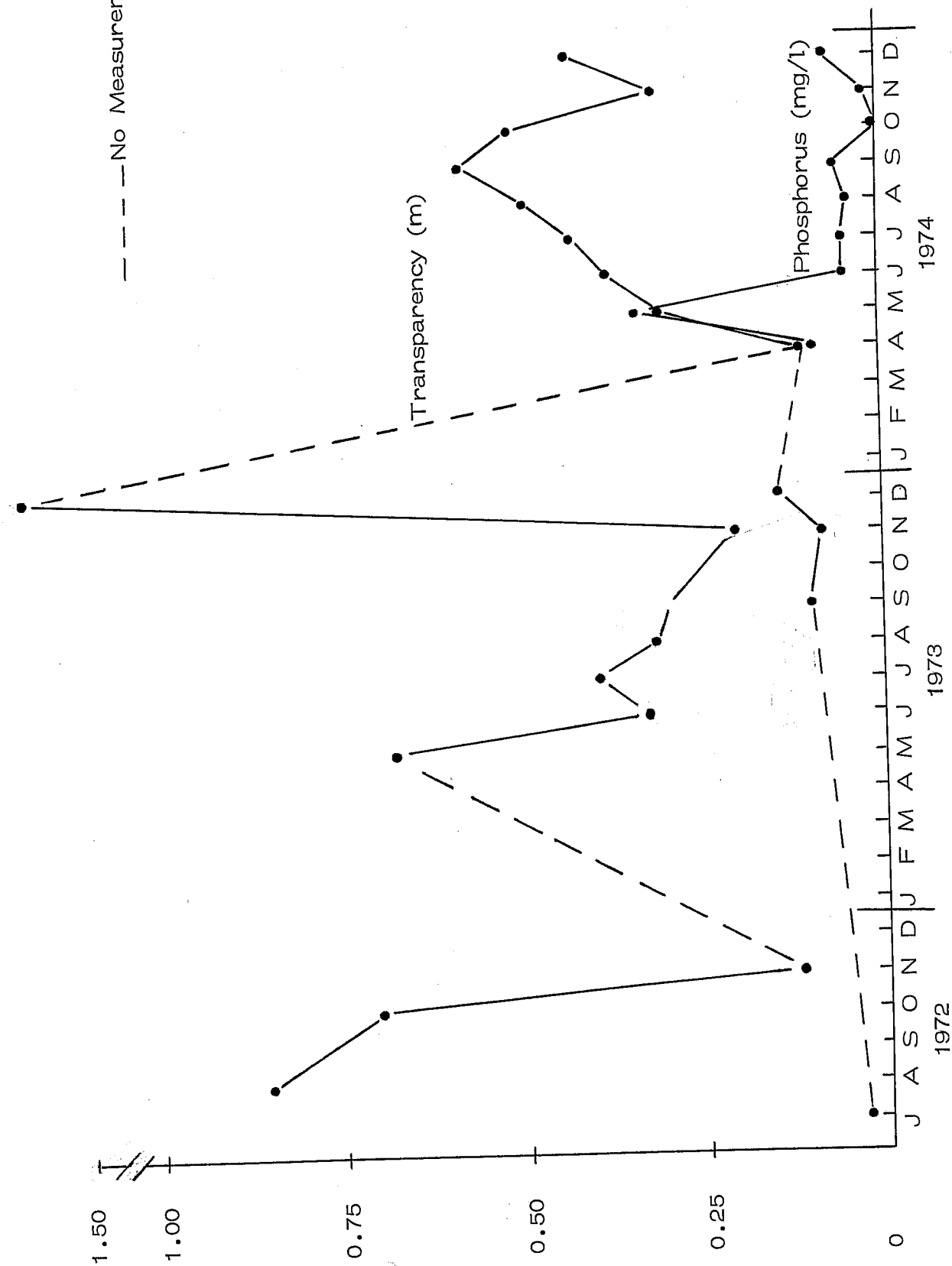
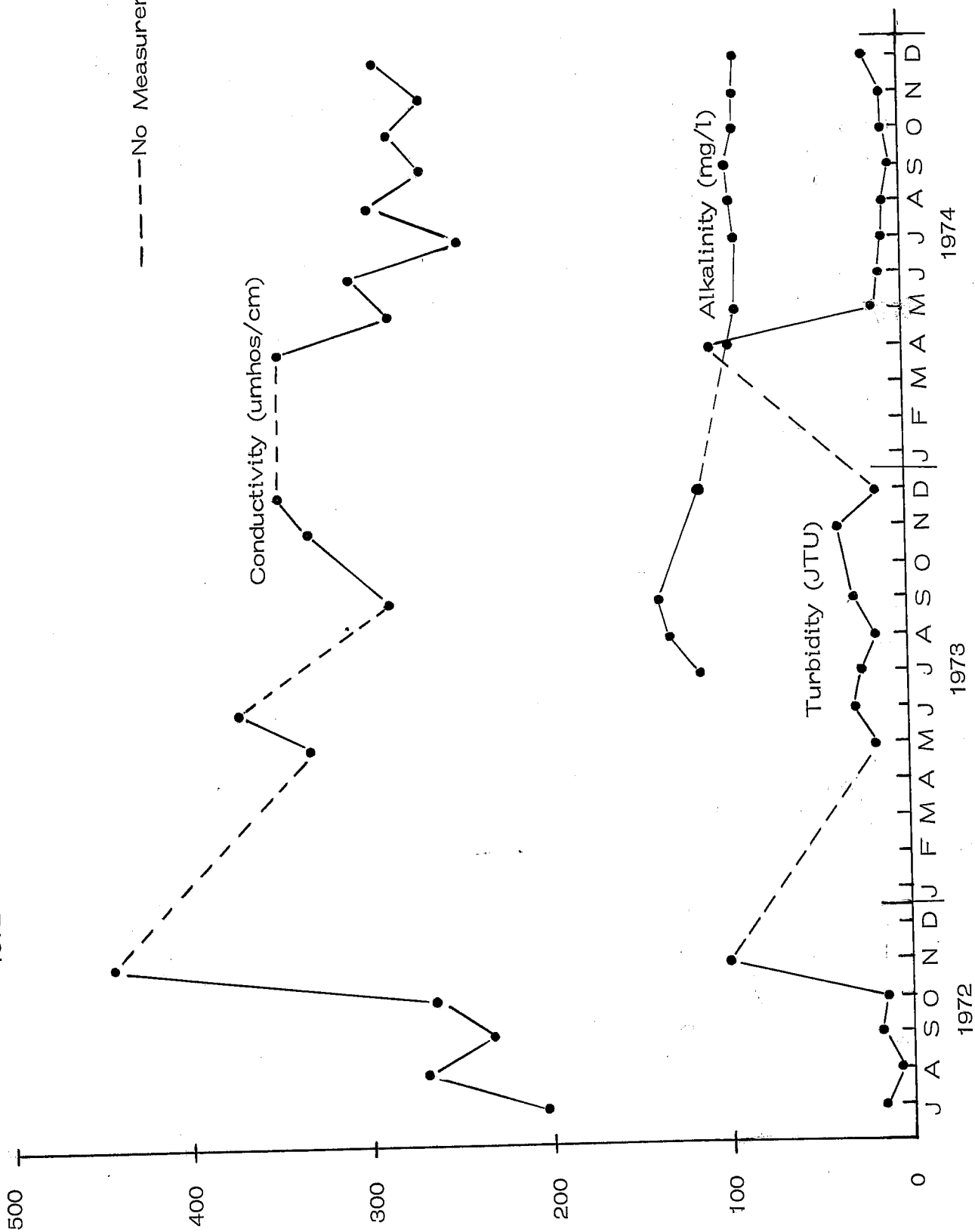


FIGURE 17. TRENDS IN MEAN MONTHLY CONDUCTIVITY, ALKALINITY AND TURBIDITY MEASUREMENTS FOR LAKE ERIE AT LOCUST POINT FOR THE PERIOD 1972 - 1974.



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