

AN ECOLOGICAL STUDY OF THE SUSQUEHANNA RIVER NEAR THE THREE MILE ISLAND NUCLEAR STATION

Annual Report for 1982

by

George A. Nardacci, Project Director and Associates

Ichthyological Associates, Inc.

P. O. Box 190, Etters, Pennsylvania 17319

For

GPU NUCLEAR CORPORATION

ICHTHYOLOGICAL ASSOCIATES, INC.

Edward C. Raney, Ph.D., President

301 Forest Drive, Ithaca, New York 14850

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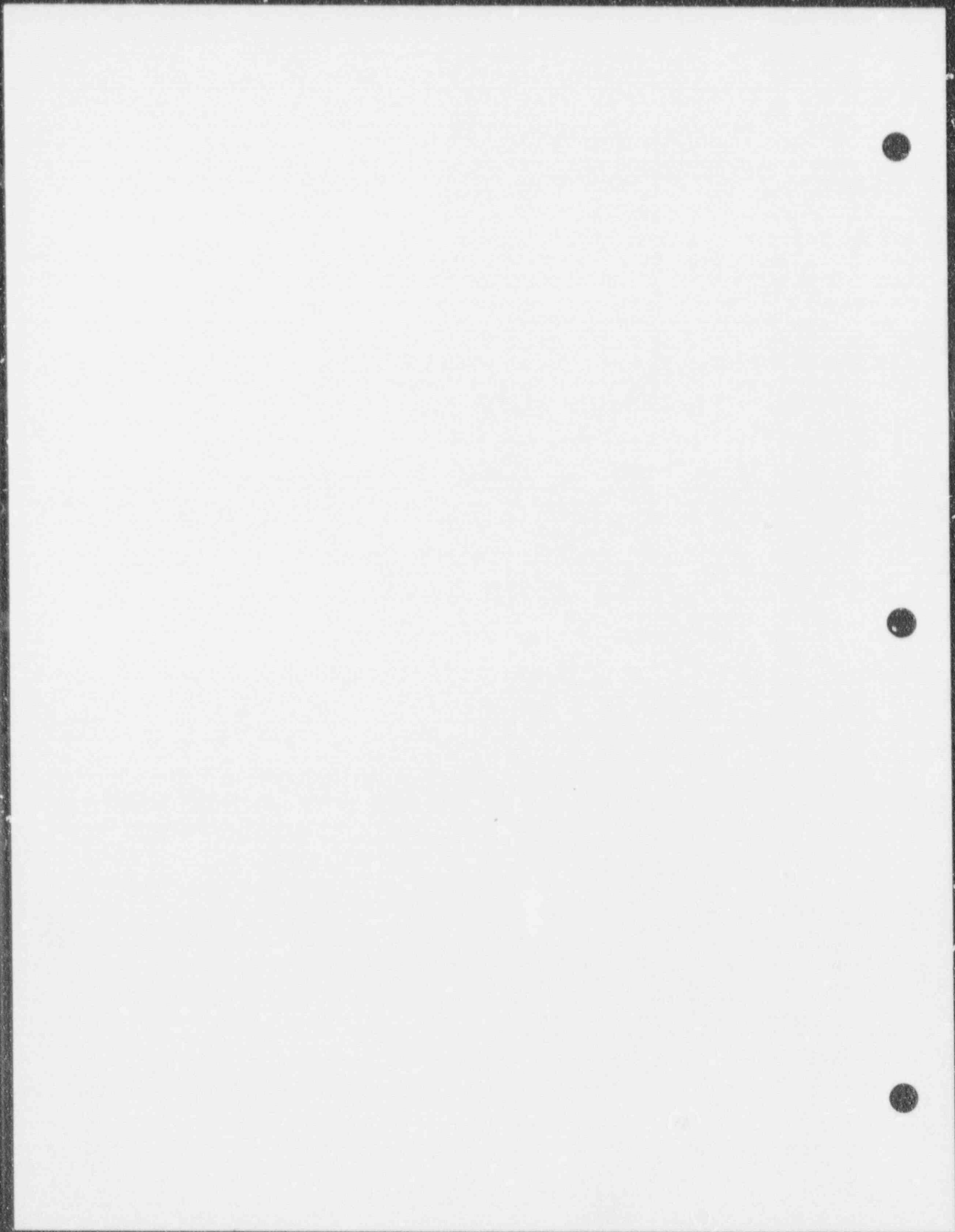
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1.0 INTRODUCTION AND SUMMARY

Ichthyological Associates, Inc. (IA) studied the aquatic ecology of the Susquehanna River near the Three Mile Island Nuclear Station (TMINS) for GPU Nuclear Corporation during 1982. The broad objectives are to obtain a comprehensive data base necessary to establish the natural fluctuations and baseline conditions of various parameters within the ecosystem and on site, and thereby identify any significant biological alterations resulting from the TMINS. Data from studies prior to 1982 have been presented in annual reports (1974 through 1981). The present report is a summary of the aquatic studies of the ecology of York Haven Pond, a mainstream impoundment on the lower Susquehanna River in southeastern Pennsylvania, conducted during 1982. Various physicochemical characteristics of the river were measured, and macroinvertebrate and fish populations were monitored. Descriptions of sampling procedures, detailed data tabulations, and interpretation of the results are presented in this report.

The Susquehanna River has a total drainage area of about $71 \times 10^3 \text{ km}^2$ (27,400 square miles) and extends about 715 km (444 miles) in length. The TMINS is located on Three Mile Island (TMI) about 275 m from the east bank of the Susquehanna River in Londonderry Township, Dauphin County, Pennsylvania at river kilometer 90 (river mile 56). The nearest metropolitan area is Harrisburg, Pennsylvania located about 16 km (10 miles) northwest of the Station.

The TMINS consists of two pressurized water reactors, with a total electrical generating capacity of 1,830 megawatts (871 mega-

watts for Unit 1 and 959 for Unit 2). Commercial operation of Unit 1 began in 1974 and Unit 2 in 1978. The TMINS is jointly owned by Metropolitan Edison Company (50%), Jersey Central Power and Light (25%), and Pennsylvania Electric Company (25%). All are wholly owned subsidiaries of General Public Utilities Corporation (GPU). During 1982, both Unit 1 and 2 remained shutdown pending regulatory response to uncertainties arising from the March 1979 accident at Unit 2.

The Station is surrounded, except along its southern border, by a small reservoir formed by York Haven and Red Hill dams. The (York Haven) pond created by the dams extends about 6 km (3.5 miles) upstream and forms the area for the aquatic studies. Normal pond elevation is 84 m (277 feet) above mean sea level and mean depth is about 3 m (9 feet). At the site, the Susquehanna River is about 2,135 m (7,000 feet) wide and divided by islands into three channels (west, center, and east). The Intake and Discharge structures for TMINS are located along the west shore of TMI and utilize water from the center channel.

1.1 Macroinvertebrates

Macroinvertebrates were collected once in January and semi-monthly March through December 1982. A total of 66,048 specimens representing 165 taxa was collected.

Total number of taxa was the highest since 1974. Total number of organisms, density, and biomass were the lowest to date; low number of organisms was a continuation of trends noted since the 1980 drought.

Dominant taxa were Limnodrilus hoffmeisteri, Chironomus decorus group sp., and Pisidium spp. Elimia virginica, C. decorus group sp., and L. hoffmeisteri had the greatest biomass.

Fifteen species were collected for the first time in invertebrate samples during 1982.

Spring breeding and population growth of Limnodrilus hoffmeisteri were found to be localized. Spring breeding and growth of the emergent insect, Chironomus decorus group sp., were synchronized at the stations.

Number of taxa collected in March at Station 1A2 was the highest to date. Monthly diversity ranged from 0.95 to 3.63. Similar to 1981, the annual diversity at each station in 1982 was highest at 1A1 and lowest at 9B1; diversity at 11A1 was the second highest. Greatest similarity (PSc) was between Stations 11A1 and 9B1 (91%). As in previous years Station 1A1 was least similar (PSc) to all other stations. The 1982 results were similar to 1981; low density of Limnodrilus hoffmeisteri, high density of Chironomus decorus group sp., and high diversity values at all stations relative to other years.

Analysis of covariance showed a significant change in the slopes of Limnodrilus hoffmeisteri densities, using control Station 1A2 as the independent variate and indicator Station 11A1 as the dependent variate, between years of plant operation (1975 through 1978) and those of plant shutdown (1979 through 1982). Differences in slopes may be related to slight changes in the

thermal and/or chemical make-up of the TMLNS Discharge between years of plant operation and/or shutdown.

1.2 Ichthyoplankton

Fourteen stations in York Haven Pond were sampled weekly day and night during April through August 1982. A total of 19,079 ichthyoplankters representing 33 species was taken. More fish were taken at night (83.9%); the ratio of the night to day catch (N/D) was 5.2:1. More species were collected at night (31) than during the day (27).

Larvae were first collected in late April. The initial density peak occurred on 18 May when river temperature first reached 20 C. Densities declined in late May and June during high river flow ($>1,000 \text{ m}^3/\text{s}$); water temperature remained below 20 C until after mid-June. The characteristic second peak of ichthyoplankton occurred on 20 July but uncharacteristically yielded the highest density of the season. The May samples were dominated by spottail shiner and common carp; quillback dominated throughout June. Pumpkinseed/bluegill were predominant in July, while spotfin shiner dominated most August samples.

Six families of fishes were represented; centrarchids were the most abundant. Seven taxa comprised over 94% of the total catch: pumpkinseed/bluegill (48.85%), common carp (17.22%), spotfin shiner (10.41%), quillback (7.35%), spottail shiner (5.25%), banded darter (3.49%), and tessellated darter (1.78%).

Percids, catostomids (mostly quillback), and some cyprinids (mainly spottail shiner and common carp) spawned in early spring,

but densities decreased in late May through June. The early summer spawners (some centrarchids and the ictalurids) spawned later; larvae were most common in July. Larvae of the late summer spawners (pumpkinseed/bluegill, spotfin shiner, and mimic shiner) occurred in July and August.

Spatial distribution and abundance of larvae followed previous patterns. The calm water areas of York Haven Pond (Stations 14B1 and 4A1) yielded most larvae due to the high concentrations of pumpkinseed/bluegill. The west TMI stations had the most similar species compositions of all localities. The lowest density stations were 15B1, 13A1, and 10B1.

Heating degree days and cumulative river temperatures explained 74% of the ichthyoplankton density variations.

Densities at the TMINS Discharge were within the expected range based on upstream densities.

Variations in abundance of ichthyoplankton were apparently related to natural environmental factors rather than to TMINS.

1.3 Entrainment of Ichthyoplankton

The spatial and temporal distribution, abundance, and composition of ichthyoplankton were investigated in the TMINS Unit 1 and 2 Intake suction bays. Samples were taken semimonthly April through August 1982. A total of 389 larvae and 159 young was taken at Unit 1. Larvae were collected from 11-12 May through 24-25 August; young were taken on 15-16 June and 10-11 and 24-25 August. Unit 2 yielded 155 larvae and 27 young. Larvae were collected on 11-12

and 25-26 May and from 22-23 June through 24-25 August; young were taken on 15-16 June and 10-11 and 24-25 August.

Statistical analyses revealed significantly different densities between years (1977 through 1982), dates, depths (surface and oblique), and time intervals (1000, 1600, 2200, 0400 h).

Estimates of the number of ichthyoplankton entrained at Unit 1 in each 24-hour sample period ranged from 0 to 211,418 and at Unit 2 from 0 to 205,521.

Entrainment appeared influenced by seasonal species succession, diel distribution, river flow, and intake velocity. Low intake volume coupled with localized entrainment indicated a minimal effect on fish populations near TMINS.

1.4 Impingement of Fish

Semimonthly 24-hour impingement surveys were conducted January through April and July through December at the Unit 1 and 2 Intakes. Weekly 24-hour surveys were conducted during May and June at each Intake. A total of 288 fish representing 15 species, 11 genera, and 5 families weighing 1,016.4 g (2.2 lb) was impinged at Unit 1. Unit 2 impinged 221 fish of 19 species, 12 genera, and 5 families weighing 3,718.2 g (8.2 lb). Most impinged fish were young (77.1% at Unit 1, 57.0% at Unit 2) and dead (85.1% at Unit 1, 90.0% at Unit 2).

The five most frequently impinged fishes at Unit 1 were the spotfin shiner (26.7% of the total impinged), pumpkinseed (14.6%), Lepomis spp. (14.2%) tessellated darter (13.9%), and bluegill

(11.1%). The four most frequently impinged fishes at Unit 2 were the tessellated darter (21.7%), channel catfish (11.3%), redbreast sunfish (10.0%), and pumpkinseed (9.5%).

Statistical analyses showed no significant differences in numbers of fish impinged during the three 8-hour time intervals, but did reveal a difference between years. Numbers of fish impinged were significantly greater in 1977 than all other years. Significantly more fish were dead than alive at both Intakes. Relationships between species composition of impingement surveys and seine and electrofishing samples taken near the Intakes were weak. The impact of impingement upon Susquehanna River fish populations near TMINS was negligible in 1982.

1.5 Fish

1.5.1 Trapnet

Trapnet collections were taken at four stations once in March and semimonthly April through December 1982. A total of 152 collections (38 collections at each station) yielded 2,531 fish of 27 species and one hybrid. Most fish (1,032) and most species (22) occurred at Station 9B2. The mean number of fish per collection ranged from 11.84 at Station 11A3 to 27.16 at Station 9B2. The largest monthly catch occurred in May (504 fish) and coincided with the peak pumpkinseed catch (330).

Common fishes included the pumpkinseed (41.2% of the catch), black crappie (14.8%), white crappie (14.0%), rock bass (7.6%), and bluegill (6.7%). The common carp accounted for the greatest biomass for a single species (73.08 kg). Juvenile and adult pump-

kinseed condition factors in 1982 were higher than their corresponding 1981 values. Most pumpkinseed, white crappie and black crappie collected were adults. Pumpkinseed abundance and spawning appeared to vary with water temperature fluctuations in May and June.

Parasite occurrence was minimal throughout the year and exceeded 10 occurrences per month only in May and November. No pattern of parasite infection, fish anomalies, or fishkills was observed with respect to the location of TMINS.

Although the 1982 total catch, number of specimens per collection, biomass, and diversity index were lower than their 1981 counterparts, values were well within the ranges established in previous years. Catch reductions were likely caused by natural fluctuations in water temperature, river flow, and fish populations and were not related to TMINS.

1.5.2 Seine

Seine collections were taken at 10 stations once in January and semimonthly March through December 1982. A total of 871 hauls yielded 102,892 fish of 40 species. Most fish (33,130) and greatest biomass (5.82 kg) occurred at Station 13B5 while most species (28) were taken at both 10B5 and 1A2. The mean number of specimens per haul ranged from 22.60 at Station 9A1 to 552.17 at Station 13B5. Most fish (19,417) were captured in September. Peak biomass (3.66 kg) occurred in June.

The spotfin shiner comprised 80.8% of the catch and was the most abundant species at all stations. Other common species were

the mimic shiner (5.0%), spottail shiner (3.8%), pumpkinseed/bluegill (1.9%), pumpkinseed (1.6%), bluegill (1.3%), bluntnose minnow (1.2%), white sucker (1.1%), and tessellated darter (1.0%). New maximum values for minnow and sunfish composition were set at four and two stations, respectively. Spottail shiner dominance led to low diversity indices, but high percent similarities.

Differences in spottail shiner mean weights and condition factors were negligible among stations with large comparable catches. Growth of the 1981 spottail shiner year class did not appear to resume until June 1982.

Parasite occurrence was moderate to heavy throughout the year. Patterns of parasite infection and fish abnormalities were similar to those reported in previous years and seemed most affected by natural trends in parasite life cycles, water temperature, and fish size rather than by TMINs.

Results indicated that although large differences in annual seine catches have occurred, the magnitudes of changes and species rankings at stations have remained similar. Seasonal Susquehanna River flow patterns favor the intermittent spawning of spottail shiner. Discrepancies with key factors for impact assessment were attributed to the effects of naturally occurring environmental variables on the year class strengths of common resident fishes.

1.5.3 Electrofishing

A boat-mounted AC electrofisher was used to sample 12 nearshore zones in York Haven Pond March through December 1982. A total of 6,341 fish of 27 species and one hybrid was captured. The pumpkinseed was the most abundant species. Five centrarchids, the rock bass,

redbreast sunfish, pumpkinseed, bluegill, and smallmouth bass accounted for 68.8% of the total catch.

Condition factor (K) was computed for all rock bass, redbreast sunfish, pumpkinseed, smallmouth bass, and walleye captured during April through November, 1976 through 1982. Statistical analyses indicated monthly and yearly differences among mean K factors for all five fishes. Rock bass, redbreast sunfish, and pumpkinseed mean K's were largest in June, probably reflecting gonadal maturation of these fishes. Smallmouth bass and walleye mean K's were high during June through September, probably indicating that summer is the maximum growth season of these fishes in York Haven Pond. Yearly differences in mean K factors probably reflect differences in monthly abundance.

Species diversity indices (H') computed for the total catch at each zone ranged from 2.67 (Zone 10B1) to 3.19 (15B2). The smallest monthly H' (all zones combined) occurred in June (2.96) and the largest (3.27) in October.

Percent similarity and Kendall's τ , both measures of species importance in the catch, showed similar groupings of zones.

The mean numbers of fish per minute captured during 15 sampling periods (April through the first November sample date) over six years (1977 through 1982) were compared with a three factor analysis of variance. Years, sampling periods, and zones all showed significant differences ($P \leq 0.05$). The years 1977, 1978, 1979, and 1981 were similar; all were significantly larger than 1982. All years were significantly larger than 1980. Among sampling

periods, spring (second April and first May sample dates) and fall (both October sample dates) had the largest means, while summer means (June through first August sample date) were smallest. Zones 10A3 and 16A2 were similar and significantly larger than most other zones; 15A2 and 10B1 were similar and significantly smaller than all other zones.

A stepwise multiple linear regression that utilized selected physicochemical parameters measured with each collection accounted for only 17.7% of the variability in numbers of fish per minute data.

Differences in species composition and abundance among zones, sampling periods, and years were probably due to habitat differences, changes in river flow and water temperature, and natural fluctuations inherent in fish populations.

1.6 Movements of Fishes

A total of 1,165 fish was tagged in 1982: 16 brown bullhead, 158 channel catfish, 476 rock bass, 426 smallmouth bass, 54 largemouth bass, and 35 walleye.

The total number of recaptures in 1982 was 116: 5 brown bullhead, 9 channel catfish, 60 rock bass, 37 smallmouth bass, 3 largemouth bass, and 2 walleye. Most 1982 recaptures (3 brown bullhead, 7 channel catfish, 48 rock bass, 28 smallmouth bass, 3 largemouth bass, and 1 walleye) were taken within York Haven Pond.

Numbers of mobile (18) and sedentary (14) brown bullhead recaptured since 1974 were similar. The majority of mobile brown bullhead (66.7%) made complex movements.

The number of mobile (34) channel catfish recaptured since 1974 was significantly larger than the number of sedentary (8) individuals.

Numbers of mobile (209) and sedentary (246) rock bass recaptured since 1974 were similar. Analysis indicated that type of movement was independent of season; distance moved was not. More than 59% of the mobile rock bass were recaptured within 2.0 km of the tagging site.

Numbers of mobile (131) and sedentary (164) smallmouth bass were similar. Analysis indicated that type of movement was independent of season; distance moved was not. More than 57% of the mobile smallmouth bass were recaptured within 2.0 km of the tagging site.

Numbers of mobile (15) and sedentary (13) largemouth bass recaptured since 1976 were similar.

Numbers of mobile (40) walleye recaptured since 1975 were significantly larger than sedentary (3) individuals. Most (83.7%) walleye moved upstream.

The proportions of mobile brown bullhead that made upstream and complex movements; rock bass that moved downstream; and walleye that made all these types of movements were significantly different from $1/3$ ($P \leq 0.05$). For all species combined, the number of fish that moved upstream was significantly greater than $1/3$, while the number moving downstream was significantly less than $1/3$. Apparently, fish tagged in York Haven Pond have a tendency to move upstream.

Analysis of movements made by rock bass and smallmouth bass tagged in areas upstream and downstream of the TMINS Discharge indicated no differences in type of movements or distances moved by fish tagged in these areas. TMINS probably had no effect on the movements of fishes tagged nearby.

1.7 Population Estimates of Fishes

Population estimates of rock bass, redbreast sunfish, pumpkinseed, bluegill, smallmouth bass, and walleye were made at four zones near TMINS in summer (23 June through 28 July) and/or fall (27 September through 1 November) 1982. Comparison of estimates among zones during each sampling period and among sampling periods at each zone (fall 1974, summer and fall 1975, summer 1976, summer and fall 1977, summer and fall 1978, summer and fall 1980, summer and fall 1981, and summer and fall 1982) were made by inspection of the 95% confidence limits.

The mean numbers of fish per minute captured at each zone during 13 sampling periods were compared with a two factor analysis of variance. Sampling periods showed the largest difference followed by zones and their interactions. Differences among zones probably reflected habitat differences. Differences among sampling periods probably reflected fish response to variations in environmental parameters such as river flow and water temperature.

1.8 Creel Surveys

Roving creel surveys were conducted on the Susquehanna River near TMINS from January through December 1982. An estimated 19,914 anglers caught 45,603 fish, kept 12,546 fish, and fished for 34,053 hours;

resulting in an estimated annual catch/effort (c/e) of 1.34 and harvest/effort (h/e) of 0.37. The number of anglers, fish kept, and hours fished were the highest since the inception of the program in 1974. The largest number of anglers, fish caught, fish kept, and hours fished in all areas combined were reported in May; however, the largest c/e and h/e were recorded in April and November, respectively. The York Haven Generating Station and General Reservoir areas combined, accounted for most anglers, fish caught, fish kept, and hours fished. The West Dam area had the highest c/e and the East Dam the highest h/e.

The channel catfish, rock bass, smallmouth bass, and walleye comprised 82.8% of the total catch and 68.6% of all fish kept. The smallmouth bass was the most abundant species caught and kept by anglers ranking first in the catch, April through November.

Over 70% of the anglers interviewed were residents of York or Dauphin counties. Most anglers indicated that they ate at least some of their catch. One hundred thirteen (4.4%) anglers still reported a change in use of catch due to the 1979 TMINS accident, with change being independent of residence and age group.

1.9 Water Quality

Surface water samples were collected once in January and semi-monthly March through December 1982.

Most data collected were within ranges that have been established since 1978. However, new maximum values were recorded for turbidity and total copper.

Results of analyses at each station revealed significant differences for water temperature, dissolved oxygen, alkalinity, sulfate, total dissolved solids, total copper, and dissolved copper; all other parameters were not significantly different.

Results of the two factor analyses of variance indicated significant differences between stations and/or years for alkalinity, sulfate, total dissolved solids, total copper, dissolved copper, and total zinc; all other parameters were not significantly different.

Values for the water quality parameters were compared to the water quality criteria for Pennsylvania. In 1982, only pH and turbidity values exceeded the State limits, but were not associated with TMINS. No adverse effects on water quality near TMINS were discernible for 1982.

1.10 Thermal Plume Mapping

The TMINS discharge plume was mapped twice in 1982. No increase in river temperature below the discharge was discernible on either date. The expanse of river near the Discharge coupled with the river flow limited the horizontal and vertical spreading of the plume to the point of discharge. The discharge temperature change was within the ranges previously reported. In general, any impact the discharge temperature might have had on the surrounding aquatic communities was indeterminate.

2.0 MACROINVERTEBRATES

Benthic macroinvertebrates may be sensitive to environmental change since many species remain in localized areas throughout much of their aquatic lives. The main objective was to assess and detect the impact of TMINS on the benthic community.

2.1 METHODS

Macroinvertebrates were collected near TMINS at five stations, two control (1A1 and 1A2) and three indicator (11A1, 11A2, and 9B1), located upstream and downstream of the TMINS Discharge, respectively (Table 2.1-1 and Figure 2.1-1). Samples were collected in January and semimonthly March through December. Ice cover prevented sampling in late January and all of February.

Four replicate samples (designated A, B, C, and D) were taken at each station with a 23 X 23 cm (529 cm²) Ponar grab sampler.

Data recorded at each station were time, air and surface water temperatures, dissolved oxygen, pH, and secchi disc. Observations of substrate type for each replicate were described in the field and ranked using Table 2.1-2. The ranks were based on all possible combinations of four substrate types (silt/clay, silt, fine sand, and coarse sand). The four substrate types were chosen based on analyses conducted in 1978 (Nardacci and Associates 1979).

Macroinvertebrate samples were returned to the lab, washed through U.S. Standard 30 mesh sieves, and fixed in a mixture of 10% formalin and rose bengal stain. The stain facilitated sorting

of macroinvertebrates from the detritus or sediment present in the sample (Mason and Yevich 1967). Macroinvertebrates were sorted and oligochaetes with anterior ends were counted from each sample. A proportion of oligochaetes and chironomids picked from the sample was selected for species identification. The method of proportioning was described in the "Procedures Manual". Further sorting and proportioning of oligochaetes and chironomids occurred under magnification (8X to 40X). Tubificid and naidid worms used for identification were cleared in Amman's lactophenol and mounted on microscope slides in Hoyer's or CMC mounting media. Chironomids were cleared in a warm 5 to 10% solution of KOH and mounted similar to the worms.

Head capsule length frequency measurements (from slides) were obtained for Chironomus decorus group sp. larvae.

Sorted macroinvertebrates not retained for taxonomic purposes were dried in a drying oven at 55 C for 24 hours, cooled in a desiccator, and weighed to the nearest 0.1 mg on a Mettler H31 balance; weights were not determined for species less than 0.1 mg. When necessary, mollusks were decalcified in a 7 to 8 M solution of HCL prior to weight determinations.

Daily river flow recorded at 0700 h was obtained for the River Forecast Center in Harrisburg, Pennsylvania (Table 2.1-3).

2.1.1 TAXONOMIC TREATMENT

Specimens were identified to genus or species when possible. For diversity calculations, each taxon represented the lowest level to which an organism was identified.

Flatworms (Turbellaria) contract when placed directly in formalin, which renders species identification difficult. For this report, they were determined to the class Turbellaria. The phyla Nemertinea and Nematods were treated similarly. Numbers and biomass were not calculated for entoprocts and bryozoans because of their colonial nature.

Identification of oligochaetes is dependent on external and internal organs. Most Enchytraeidae, Naididae, and some tubificids (Aulodrilus, Branchiura, Pelosclex, and Limnodrilus udekemianus) can be identified by their somatic chaetae (hair-like structures present on all oligochaetes) or external structures at all stages in their development. Sexually mature specimens are needed for species identification for most Limnodrilus, Ilyodrilus, and Tubifex. Ilyodrilus and Tubifex may be separated from Limnodrilus by the presence of capilliform chaetae; Limnodrilus possess only bifurcate crochet chaetae. Of the sexually mature Limnodrilus (excluding L. udekemianus) encountered in 1982, approximately 97% were L. hoffmeisteri. Immature Limnodrilus were grouped with L. hoffmeisteri for interpretation of data (Fisher and Beeton 1975, Hiltunen 1967, Kennedy 1966). Immature Ilyodrilus and Tubifex were recorded as immature

tubificids with capilliform chaetae. For data analyses, these were grouped with I. templetoni and I. tubifex, respectively, and calculated on a percentage basis from the number of sexually mature specimens collected monthly at each station.

Unidentifiable limiculous earthworms were recorded as megadriles (a term which collectively encompasses many families of earthworms).

Leeches (Hirudinea) contract when placed directly in formalin, which makes identification difficult. Most leeches were identified to species; erpobdellid leeches were identified only to family.

A few specimens of the crustacean subclass Ostracoda and Copepoda, and order Cladocera were large enough to be retained in the sieves of some samples. They were not enumerated or weighed because of their small size, but their presence was noted.

Larval and pupal dipterans were combined for some data interpretation.

When taxonomic keys were unavailable or incomplete for species separation in some genera, apparently different species of a genus were given letter designators (i.e., Phaenopsectra sp. A). Some genera or species are separable only to groups at the immature stages. For example, the Palpomyia group (Diptera: Ceratopogonidae) consists of several genera which are presently inseparable in their larval stages. The Cryptochironomus fulvus group (Diptera: Chironomidae) may contain as many as ten species, which are presently separable only in the pupal and adult stages.

The chironomid, Dicrotendipes nervosus (Staeger) is a complex of at least two larval types (Simpson and Bode 1980). These are designated as D. nervosus Type I and D. nervosus Type II.

Some determinations were followed by a '?' or 'cf' between the genus and species name, which indicated uncertain identifications.

Taxonomic revisions and misidentifications resulted in the following amended determinations for 1992. The misnomer is followed by the report(s) it appeared in. All previous reports refers to Nardacci and Associates (1977, 1978, 1979, 1980, 1981, 1982), Nardacci et al. (1976, 1977), and Potter and Associates (1975, 1976). The current name is followed by the source describing the change or correction.

Peloscolex ferox (all previous reports) = Spirosperma ferox (Brinkhurst 1981, Stimpson et al. 1982).

P. multisetosus (all previous reports) = Quistadrilus multisecus (Brinkhurst 1981, Stimpson et al. 1982).

P. variegatus (Nardacci and Associates 1979, 1980, 1981, 1982) = S. nikolskyi (Brinkhurst 1981, Stimpson et al. 1982).

Stenonema ares (Nardacci and Associates 1977, 1978, 1979, 1980, 1981, 1982) = S. terminatum (personal communication with Dr. R.W. Flowers, Dep. Entomol., Florida A and M Univ., Tallahassee, FL).

Heptagenia lucidipennis (Nardacci and Associates 1980, 1981, 1982) = Nixe lucidipennis (Flowers 1980 and personal communication with Dr. R.W. Flowers).

H. maculipennis (Nardacci and Associates 1980, 1981, 1982) = Leucrocuta maculipennis (Flowers 1980 and personal communication with Dr. R.W. Flowers).

Ranatra kirkaldyi (Nardacci and Associates 1982) = R. nigra
(personal communication with Dr. R.C. Froeschner, Dep. Entomol.,
Smithsonian Institution, Washington, D.C.).

Hydropsyche morosa (Nardacci and Associates 1977, 1978, 1979, 1980,
1981, 1982) = symphitopsyche morosa (Schuster and Etnier 1978).

Parargyractis sp. (Nardacci and Associates 1977, 1978, 1979, 1980,
1981, 1982; Potter and Associates 1976) = Petrophila (Brigham and
Herlong 1982).

Eukiefferiella bavarica group sp. (Nardacci and Associates 1982) =
Ivetenia bavarica group sp. (Saether and Halvorsen 1981 and personal
communication with R. Bode, NY. St. Dept. Health, Albany, NY).

E. discoloripes group sp. (Nardacci and Associates 1982) = I.
discoloripes group sp. (Saether and Halvorsen 1981 and personal
communication with R. Bode).

Nanocladius andersoni n. sp. (Nardacci and Associates 1981, 1982) =
N. minimus n. sp. (Saether 1977).

Physa (all previous reports) = Physella (Burch 1982).

Goniobasis (all previous reports) = Elimia (Burch 1982).

Spirodon (Nardacci and Associates 1977, 1978, 1979, 1980, 1981,
1982; Potter and Associates 1975, 1976) = Leptoxis (Burch 1982).

Macroinvertebrate taxa found in the Susquehanna River near Three
Mile Island are listed in Table 2.1-4.

In addition to taxonomic references cited in Nardacci and Associates
(1977, 1978, 1979, 1980, 1981, 1982), identification of benthic organisms
was aided with keys and descriptions in Bednarik and McCafferty (1979),

Brigham et al. (1982), Burch (1982), Crocker and Bar (1968), Flowers (1980), Flowers and Hiisenhoff (1975), Hiltunen and Klemm (1980), Klemm (1982), McAlpine et al. (1981), McCafferty (1981), Morihara and McCafferty (1979), Roback (1981), Stimpson et al. (1982), and Williams (1976).

2.1.2 DATA ANALYSIS: POPULATION

Seasonal distribution of density (number/m²), biomass (mg/m²), average weight per individual (AW/I), and head capsule length frequency data were calculated for selected dominant taxa based on numbers and weights at each station.

For analyses, seasonal distributions were discussed specifically by sample date or more generally by season. Seasons were defined as spring (March through early June), summer (late June through August), fall (September through early November), and winter (mid-November through February). In an effort to control some of the natural variation for analyses, seasonal variation was removed by fitting macroinvertebrate densities (number per ponar grab) to a second degree polynomial regression using Julian calendar day as the independent variable. The resultant predicted density, i.e., density as a result of seasonal effect, was subtracted from the actual density. The remaining residual density represented density with the seasonal effect removed. By working with residual densities, comparisons between years for station effects were less biased by large yearly differences in seasonal densities. For this report, residual densities were used instead of actual densities for analysis of variance tests (ANOVA).

For each year (1975 through 1982) variation in populations of Lymnodrilus hoffmeisteri and total number of organisms was examined by three factor ANOVA's [fixed effects, Model (I)] at the $P \leq 0.05$ significance level (Sokal and Rohlf 1969). Data were untransformed for the ANOVA's since it is better to rely on the robustness of the ANOVA than transform the data (McCaughran 1977). The factors used in the ANOVA were sample date, station, and replicate. The Student-Newman-Keuls multirange (SNK) test was applied to mean numbers of those factors found significantly different in the ANOVA (Woolf 1968). The SNK test indicated which means were not significantly different. Data for 1974 were excluded because sampling did not commence until April.

An analysis of covariance (ANCOVA) (Snedecor and Cochran 1967) was performed to determine if the relationship between densities at control Station 1A2 and each indicator station (11A1, 11A2, and 9B1) was significantly different from year to year. Station 1A2 was used as a control because its habitat and community structure was more similar to the indicator stations than 1A1. The relationship between densities at the control and indicator stations was determined by examining the slopes of the best fit regression line for each year. ANCOVA may be a better analytical method than ANOVA, since by considering how control and indicator station densities covary, all environmental factors influencing both stations would be discounted.

A significant change in slope may be associated with TMINS operation. The control station densities were treated as independent variates and the indicator station densities the dependent variates. Densities of Limnodrilus hoffmeisteri and total number of organisms, representing the sum of all replicate observations, were used in analysis.

2.1.3 DATA ANALYSIS: COMMUNITY

Diversity values were used in the analysis of community structure. Several diversity indices are available (Kaisler and Herricks 1976, McErlean and Mihursky 1969). The index chosen was the Shannon-Weaver diversity Index (H'):

$$H' = - \sum_{i=1}^s \left(\frac{n_i}{N} \right) \log_2 \left(\frac{n_i}{N} \right)$$

which expresses the relative importance of each species collected. The Shannon-Weaver Index is used when one assumes the sample is representative of a much larger population whose diversity must be estimated (Kaisler and Herricks 1976, Lloyd et al. 1968b, Pielou 1966). The index summarizes information concerning the types of organisms which occur and the distribution of individuals among the species. Small numbers of taxa and uneven distribution of individuals result in low H' values. High H' values result from large numbers of taxa and even distribution of individuals in each taxon. H' values were estimated from the machine

formula:

$$H' = \frac{C}{N} (N \log_{10} N - \sum n_i \log_{10} n_i)$$

where H' = information per individual, $C = 3.321928$ (converts base 10 logarithms to base 2), N = total number of individuals, and n_i = total number of individuals in the i^{th} species (Lloyd et al. 1968b).

Diversity values between communities may be similar but the species composition may be totally different. Therefore, diversity indices used alone may be of little value when comparing macroinvertebrate communities (Clarke et al. 1977). An index of percent similarity was used to investigate community similarities between macroinvertebrate stations (Whittaker and Fairbanks 1958). This index is expressed as:

$$PSc = 100 - 0.5 |a-b|$$

where PSc = the percent similarity and a and b = the percentages of a species in samples A and B. This is a quantitative measure of the relative similarity of species composition and abundance between two samples. The PSc is an empirical measure and is not an estimate of a statistical parameter of the population from which the samples are drawn. PSc values may range from 0 (the species composition is entirely different) to 100 (complete similarity).

2.2 RESULTS

Results of 1982 macroinvertebrate collections are reported in Tables 2.2-1 through 2.2-55. A total of 66,048 specimens of 165 taxa including colonial organisms was taken in 420 collections (Table 2.2-56).

In 1982 the dominant taxa were Limnodrilus hoffmeisteri (30,941, 46.85%), Chironomus decorus group sp. (18,102, 27.41%), and Pisidium spp. (2,153, 3.26%) (Table 2.2-56). Other taxa that comprised more than one percent of total number of organisms were Procladius spp. (1,796, 2.72%), Cryptochironomus fulvus group sp. (1,662, 2.52%), Polypedilum scalaenum group sp. (1,526, 2.31%), Arctonais lomondi (1,345, 2.04%), L. udekemianus (1,084, 1.64%), Gammarus fasciatus (953, 1.44%), and Turbellaria (668, 1.01%).

Percent composition of the dominant taxa (>2% of total number of organisms) at each station are presented in Figure 2.2-1. Limnodrilus hoffmeisteri was the most abundant organism at all stations except Station 1A1, where it ranked second. Chironomus decorus group sp. was most abundant at Station 1A1 and ranked second at all other stations. Polypedilum scalaenum group sp. was the third most abundant organism at Station 1A1.

Seasonal distribution of density and biomass of total number of organisms at each station are presented in Figure 2.2-2. Highest density at Stations 11A1, 11A2, and 9B1 occurred on 24 May. Density was second highest on 24 May at Stations 1A1 and 1A2. High densities on 24 May were due to large numbers of Chironomus decorus group sp. The seasonal distribution of density followed trends of dominant organisms. Peak biomass occurred on 24 May at Stations 11A1 and 9B1 and on different sample dates for the other stations. Peaks and fluctuations of total biomass were influenced by large organisms such as Elimia virginica and Hexagenia spp. When large organisms were not present biomass fluctuations tended to follow the density distribution.

Relative seasonal abundance of three major macroinvertebrate groups in 1982 dominated the benthos (Figure 2.2-3). The Oligochaeta, Chironomidae, and Mollusca comprised over 86% of the total number of organisms on all sample dates. Oligochaetes were highest in relative density on all sample dates except 24 May and 1 November when chironomids were highest.

2.2.1 NEW SPECIES

In 1982, fifteen species were collected for the first time in macroinvertebrate samples near TMINS. Generally, the occurrence of these taxa in the sample areas was a result of drift. Fourteen were insects and one was an isopod, Lirceus sp. The insects consisted of mayflies, Stenonema mediopunctatum, S. terminatum, Potamanthus walkeri; a caddisfly, Hydropsyche aerata; craneflies, Erioptera sp., Pseudolimnophila sp., Tipula (Yamatotipula) sp.; and chironomids, Larsia sp., Paramerina sp., Cricotopus (Cricotopus) prob. tremulus, Mesocricotopus sp., Orthocladus (Euorthocladus) rivicola, O. (Orthocladus) oliveri, and Chironomus riparius group sp. In addition the chironomid, Tanytarsus was separated into four groups of species; T. ejuncidus?, T. glabrescens group ? sp. A, T. guerlus group sp., and Tanytarsus group A.

2.2.2 POPULATION ANALYSIS

2.2.2.1 DENSITY

Seasonal density of selected taxa (>2% of the total number of organisms) at each station is presented in Table 2.2-57. Density of Limnodrilus hoffmeisteri ranged from 33/m² on 12 April at Station 1A1 to 7,721/m² on 15 November at Station 1A2. Peak densities for 1982 at the upstream stations occurred during fall and early winter,

and for the downstream stations in the summer. Similar to 1981, the L. hoffmeisteri population in 1982 at Station 9B1 maintained a relatively high density throughout the year (Nardacci and Associates 1982). As in previous years, the seasonal distribution of L. hoffmeisteri at Station 1A1 was relatively low compared to the other stations (Nardacci and Associates 1977, 1978, 1979, 1980, 1981, 1982; Potter and Associates 1976). Reasons for the lower density at 1A1 were attributed to substrate (Nardacci and Associates 1981).

Seasonal distribution of Chironomus decorus group sp. density ranged from 0 on 12 July at Station 1A1 to 9,743/m² on 24 May at Station 9B1 (Table 2.2-57). Peak density in 1982 at each station occurred on 24 May except at 1A1 when it occurred on 4 October. The high density of C. decorus group sp. on 24 May at Stations 1A2, 11A2, and 9B1 surpassed the highest density value for Limnodrilus hoffmeisteri (7,721/m²).

Seasonal distribution of Pisidium spp. density ranged from 0 to 709/m² (Table 2.2-57). Peak density in 1982 at each station occurred on 12 April at 1A1, 10 May at 1A2, 9 August at 11A1, 1 November at 11A2, and 15 November at 9B1.

Peak density occurred on 10 May for Polypedilum scalaenum group sp. at Station 1A1, on 15 November for Cryptochironomus fulvus group sp. at 9B1, and on 16 December for Arctonais lomondi and Procladius spp. at 1A2 and 11A1, respectively (Table 2.2-57). Most P. scalaenum group sp. specimens were collected at the upstream stations, particularly 1A1. Unlike P. scalaenum group sp., the presence of A. lomondi was more evenly distributed among the stations and occurrence was seasonal.

2.2.2.2 BIOMASS

Seasonal distribution of biomass of selected taxa at each station is presented in Table 2.2-58. Peak biomass of Elimia virginica at each station fluctuated throughout 1982. The greatest biomass of E. virginica was 8,699.2 mg/m² at Station 11A2 on 6 January. Other biomass values for 1982 ranged from 0 to 5,232.0 mg/m². No E. virginica specimens were collected on 14 of the 21 sample dates at Station 1A2.

Peak biomass of Limnodrilus hoffmeisteri populations at each station occurred on 16 December at 1A1, 6 January at 1A2, 26 July at 11A1, 24 May at 11A2, and 10 May at 9B1; the greatest biomass occurred at 9B1 (1,749.5 mg/m²) (Table 2.2-58). Similar to 1981, time and location of greatest biomass did not coincide with highest density (Tables 2.2-57 and 2.2-58). Biomass of L. hoffmeisteri was usually higher at Station 9B1 compared to the other stations (16 of the 21 sample dates).

Peak biomass of Chironomus decorus group sp. at each station occurred 24 May, and coincided with peak density except at Station 1A1 (Tables 2.2-57 and 2.2-58). Highest biomass on 24 May occurred at Station 1A2 (2,963.5 mg/m²). Unlike 1981 results, biomass was not higher March through June at Stations 11A1 and 11A2 compared to the rest of the year (Nardacci and Associates 1982).

Peak biomass of Hexagenia spp. at each station occurred at different times during the year (Table 2.2-58). Highest biomass occurred on 16 December at Station 1A2 (4,211.0 mg/m²). Occurrence of Hexagenia spp. was more consistent at Station 9B1 compared to other stations. Station 9B1 often accumulated more silt than the other stations because of the

eddy created (during low river flow) by York Haven Dam, and provides an ideal habitat for the burrowing mayfly, Hexagenia spp.

2.2.2.3 BREEDING CYCLES OF SELECTED TAXA - 1982

Breeding cycles of Limnodrilus hoffmeisteri were analyzed at each station with seasonal average weight/individual (AW/I) and percent mature and immature data (Figure 2.2-4). According to Kennedy (1966) mature worms form the majority of the Limnodrilus population at the time of greatest breeding activity. Poddubnaya (1980) stated from the time of hatching, sexual maturity of L. hoffmeisteri was achieved in one to six months.

From the data, spring breeding was not particularly synchronized between stations, but occurred at different times during April, May, and June (Figure 2.2-4). These findings concur with Kennedy (1966) who found breeding cycles can vary from station to station or year to year at one station. Spring breeding was followed by a period of low AW/I values and high percentages of immature specimens, except at Station 1A1. Another breeding occurred during August or September at each station, but the majority of specimens were not mature at Station 1A2. The AW/I values during August and September were low compared to spring AW/I values, except at 1A1. Low AW/I values, and high percentages of mature specimens indicated Limnodrilus hoffmeisteri may be breeding at an earlier age in late summer than in spring. The ability to reach maturity at an earlier age was attributed to warmer water temperatures. Aston's laboratory experiments on L. hoffmeisteri found the worms were able to develop from egg to maturity in five weeks at 25 C (Aston 1973).

Limnodrilus hoffmeisteri during November and December increased in weight and in percent mature specimens at each station (Figure 2.2-4). Breeding may therefore occur during the winter.

Since some mature worms were present on most sample dates at each station, some breeding probably occurred throughout the year. These observations concur with Kennedy's (1966) findings.

Growth at Station 1A1 did not appear to be as stunted as other years (Nardacci and Associates 1981, 1982). In 1982, Station 1A1 AW/I values were consistently higher throughout the summer compared to the other stations.

AW/I and density of Chironomus decorus group sp. are presented in Figure 2.2-5. Head capsule length frequency data of C. decorus group sp. are presented in Figure 2.2-6. Chironomids in general have four larval instar stages (Oliver 1971). Head capsule lengths used to differentiate between the instar stages were: 1) first and second instars were those less than 0.295 mm, 2) third instars were those from 0.295 to 0.475 mm, and 3) fourth instars were those greater than 0.475 mm.

Generally, macroinvertebrate sampling collected third and fourth instar stages of Chironomus decorus group sp. (Figure 2.2-6). Results concurred with Heuschele (1969) who attributed lack of early instars to loss through the sieve during sample washing. Sieves used were larger (0.595 mm mesh openings) than those reported by Heuschele (1969) (0.42 mm) and probably resulted in the loss of the first two instar stages. Density of third instar larvae were lower than fourth instar larvae; Heuschele (1969) also reported similar results. The head capsule width of third

instar C. decorus group sp. was approximately 0.3 mm (Heuschele 1969). Therefore, many third instar larvae were assumed lost during the sample washing process.

Heuschele (1969) reported Chironomus decorus group sp. overwinter in the fourth instar stage. While 1982 data generally agree, it appeared some third instar larvae overwintered in the study area (Figure 2.2-6). A major emergence of C. decorus group sp. occurred near the 24 May sample date (Figure 2.2-5). The AW/I was low on this date, which was attributed to the large proportion of the smaller third instar larvae present in the sample. Prior to 24 May few third instar larvae were sampled and the bulk of the AW/I values were based on fourth instar larvae. The presence of the increased number of third and fourth instar larvae on 24 May may be explained by a late winter or early spring emergence, migration into the sample areas, or both. Hilsenhoff (1967) attributed sudden increases of C. plumosus density to migration; the main reason for this migration was to find a more suitable habitat.

Pupae of Chironomus decorus group sp., another indication of emergence, were present 10 May through 9 August and 4 October through 2 December (Figure 2.2-6). The presence of pupae October through December had not been observed in previous years (Nardacci and Associates 1977, 1978, 1979, 1980, 1981, 1982; Potter and Associates 1976). Reasons for the late emergence in 1982 were not apparent.

An important difference between Limnodrilus hoffmisteri and Chironomus decorus group sp. life cycles in 1982 involved spring breeding. Spring breeding appeared to be more synchronized for the

emergent insect, C. decorus group sp. Large numbers of C. decorus group sp. fourth instar larvae were present at each station on the same sample date. Spring breeding of L. hoffmeisteri did not occur on the same date at all stations. The more spatially isolated L. hoffmeisteri tend towards localized breeding cycles.

2.2.2.4 STATISTICAL ANALYSIS

Results of the three factor ANOVA for Limnodrilus hoffmeisteri residual density were significant for sample date, station, replicate, and the date-station interaction (Table 2.2-59). Although the date effect was significant it was low relative to station effect. Results of the SNK test on replicates showed replicates A and D were not significantly different; replicates A, B, and C were not significantly different from each other. The SNK test performed on station residual mean densities is presented in Table 2.2-60, along with the actual mean densities. Stations 11A1 and 11A2 were not significantly different.

2.2.3 COMMUNITY ANALYSIS

2.2.3.1 TAXA

Seasonal distribution of the number of taxa at the stations was lowest in April and June (18 taxa) at 11A2 and 9B1, respectively, and highest in March at 1A2 (66 taxa) (Figure 2.2-7). The 66 taxa were the highest monthly total ever collected (Nardacci and Associates 1977, 1978, 1979, 1980, 1981, 1982; Potter and Associates 1975, 1976). The high number may be attributed in part to drift from high spring flows (Hynes 1970). Number of taxa were evenly distributed among stations; no station contained continually higher numbers of taxa than the others.

2.2.3.2 DIVERSITY

Monthly diversity (H') values ranged from 0.95 in March at Station 9B1, when Limnodrilus hoffmeisteri comprised 87% of the organisms (23 taxa), to 3.63 in March at 1A2, when L. hoffmeisteri comprised 41% of the organisms (66 taxa) (Table 2.2-61). Peak monthly diversity at each station occurred in August at 1A1, March at 1A2, April at 11A1, January at 11A2, and November at 9B1.

Monthly station comparison of H' values in 1982 showed peak diversity occurred at Station 1A1 during 6 of the 11 months sampled. Numbers of taxa at Station 1A1 were not higher than the other stations, but diversity values were higher. The higher H' values were attributed to relatively low densities of all species present throughout the year.

Annual H' values based on all data collected at each station are presented in Table 2.2-61. Diversity was highest (2.93) at Station 1A1, and lowest (2.13) at 9B1; diversity at the TMINS Discharge (11A1) was second highest (2.67).

2.2.3.3 PERCENT SIMILARITY

Range of percent similarity values (PSc) between stations is presented in Table 2.2-62. The greatest similarity was between Stations 11A1 and 11A2 (91%). As in other years Station 1A1 was least similar to all other stations. Lowest similarity was between 1A1 and 9B1 (51%). The reason for low PSc values between 1A1 and the other stations was attributed to habitat differences.

2.3 DISCUSSION

Total number of taxa was higher in 1982 compared to all other years (Table 2.3-1); total number of organisms was the lowest since 1974. The percent composition, density, and biomass of Limnodrilus hoffmeisteri was the lowest to date. Chironomus decorus group sp. percent composition was highest; density and biomass were third highest. The 1981 and 1982 yearly densities of C. decorus group sp. were similar. The catastrophic decline of L. hoffmeisteri since 1981 was attributed to the 1980 drought and subsequent repopulation of drought affected areas by C. decorus group sp. (Nardacci and Associates 1982).

Diversity in 1982 was the same as 1981 (2.70), which also was the highest (Table 2.3-1). As in 1981, the high yearly diversity value in 1982 was attributed to high numbers of taxa and low numbers of Limnodrilus hoffmeisteri.

The decline in Limnodrilus hoffmeisteri and total number of organisms; the high number of Chironomus decorus group sp.; and higher diversity values and numbers of taxa particularly at the downstream stations were all a continuation of trends recognized in 1981 (Nardacci and Associates 1982).

2.3.1 LIFE CYCLES

2.3.1.1 LIMNODRILUS HOFFMEISTERI

Life cycles of oligochaete species can be identified through seasonal sampling (Poddubnaya 1980). Life cycles of Limnodrilus hoffmeisteri in 1982, using mean densities compared to the range of previous years at

each station are illustrated in Figures 2.3-1 through 2.3-5. Nardacci and Associates (1982) reported high densities occurred in June or July at each station each year and resulted from spring breeding; the majority were immature specimens. In 1982, density was high at the downstream stations during June or July. Density at the upstream stations was not high until fall. The AW/I and percent mature and immature data suggested two breeding times occurred, in the spring-early summer and late summer. The increased numbers of mature specimens in late summer may account for the subsequent high densities in the fall and winter. The late November sample date at 1A2 and early May date at 9B1 were the only dates in 1982 when density was above the ranges established previously. As in 1981, the 1982 mean density distribution at all stations was within its mid to low range. New minima occurred on several dates at each station.

2.3.1.2 CHIRONOMIDS

Seasonal distribution of selected chironomid population mean densities in 1982 compared to the range of previous years is illustrated in Figures 2.3-6 through 2.3-10. Peak population growth followed by sudden declines of chironomid densities may indicate a population reduced by emergence or by catastrophic events like flooding or ice scouring

Overlapping generations are not uncommon among insects and may present problems in analyzing population growth and life cycles. In addition, the life cycles for some chironomids were difficult to interpret from the graphs because a taxon may represent more than one species.

Peak growth and spring emergence of Chironomus decorus group sp. occurred in late May or June each year, excepting 1976 and 1980 (Nardacci and Associates 1977, 1981). Although the 1976 density was high in May, peak density occurred in late June. The life cycle of C. decorus group sp. populations may have been disrupted by the flooding caused by Hurricane Eloise in September 1975. Emergence in 1980 was delayed until July after which densities remained high the rest of the year. Delayed emergence in 1980 was attributed to inclement weather in 1979. This reduced the overwintering populations of C. decorus group sp.

Since 1975, the presence of pupae, which indicated emergence, were collected and recorded from April through early October (Nardacci and Associates 1977, 1978, 1979, 1980, 1981, 1982; Potter and Associates 1975, 1976). Therefore, some amount of breeding occurred from spring through early fall in all years. In 1982, C. decorus group sp. pupa were present from April through 2 December indicating a more extended breeding period compared to previous years.

Life cycles of Procladius spp. and Cryptochironomus fulvus group sp. were difficult to interpret since several species were included in each taxon. Both taxa had multiple peaks throughout the year (Figures 2.3-6 and 2.3-8). Several species with overlapping population growth cycles and generations were indicated.

Polypedilum halterale group sp. and P. scalaenum group sp. densities, while each comprised several species, appeared to have more well defined peaks and troughs than Procladius spp. and Cryptochironomus fulvus group sp.

(Figures 2.3-6, 2.3-8, 2.3-9, and 2.3-10). This may be an indication of less breeding overlap among the species; and therefore, better defined breeding cycles. Since the P. halterale group sp. and P. scalaenum group sp. are composed of no more than three or two species, respectively, well defined peaks and troughs could indicate the presence of multivoltine species (reproducing several times each season), univoltine species (reproducing only once a season), or a combination. Head capsule measurements would not contribute substantial information toward understanding either taxon because of small larvae size; only fourth instar larvae are retained in the sieve.

2.3.2 IMPACT ASSESSMENT - 1982

Results of the three factor ANOVA and SNK tests on residual densities of Limnodrilus hoffmeisteri (1975 through 1982) are presented in Tables 2.3-2 and 2.3-3; actual mean densities are reported in Table 2.3-4. Density at Station 1A1 compared to the other stations each year was lowest and significantly different. During the operation of Unit 1 (1975 through 1978) and Unit 2 (1978) the Discharge station (11A1) ranked highest in residual and actual density. Residual densities for 11A1 were significantly different from those of all other stations, except in 1976 when it was not significantly different from 11A2.

Between 1978 and 1979 a change in relative rankings of the stations occurred (Tables 2.3-3 and 2.3-4). Residual and actual densities of Limnodrilus hoffmeisteri at control Stations 1A1 and 1A2 increased. Density at Station 9B1, which may be considered a low impact

area because it is located 1975 m downstream of the TMINS Discharge, also increased. The mean residual density at Station 11A2, located about 75 m downstream of the Discharge, decreased slightly. Station 11A1, located 10 to 25 m downstream of the Discharge, had the greatest decrease in density and relative station rank.

The results of ANCOVA, on densities of Limnodrilus hoffmeisteri showed a significant linear relationship between control Station 1A2 and each indicator station (Table 2.3-5). The slopes between years (equality of slopes) were significantly different. Ranks of slopes for each year between Station 1A2 and each indicator station is presented in Table 2.3-6. The pattern of slopes for years between Stations 1A2 and 11A1 indicated slopes for years of plant operation (1975 through 1978) were always higher than slopes for years of plant shutdown (1979 through 1982). The pattern of slopes for years between 1A2 and indicator Stations 11A2 and 9B1 was not as clearly divided.

ANCOVA was then performed on grouped data of Limnodrilus hoffmeisteri densities; Station 1A2 was the independent variate and 11A1 the dependent variate (Table 2.3-7). Data were grouped by years of plant operation (1975 through 1978) and plant shutdown (1979 through 1982). No significant difference was found between the slopes of the operational years; no significant difference was found between the slopes of the plant shutdown years. A significant difference was found between the slopes of the operational years and those of the plant shutdown years. ANCOVA removed environmental factors shared by the stations; therefore, differences between the slopes may be attributed to plant operation and/or subsequent shutdown.

ANCOVA identified a significant change in the Limnodrilus hoffmeisteri population at Station 11A1 between the years of plant operation and those of plant shutdown. Thermal and/or chemical changes at the TMINS Discharge (11A1) may be related, since i.e. an artificial increase in temperature may enhance a population (Gibbons 1976). Temperature increases of several degrees or only a fraction of a degree above ambient may affect the organism indirectly; i.e. increased primary production (food source), or directly; i.e. faster body growth, earlier maturity, or increased reproduction.

2.3.3 COMMUNITY STRUCTURE

Annual numbers of taxa and total numbers of organisms at each station are illustrated in Figure 2.3-11. For all years, the highest number of taxa occurred in 1982 at Station 1A2. Highest total number of organisms occurred in 1977 at Station 11A1. Low numbers of organisms at all stations since 1981 were attributed to the 1980 drought.

Results of three factor ANOVA on residual density of total number of organisms (1975 through 1982) are presented in Table 2.3-2. SNK results of mean residual densities and ranking of mean actual densities for each station (1975 through 1982) are presented in Tables 2.3-8 and 2.3-9, respectively. Trends were similar to those discussed for Limnodrilus hoffmeisteri and reported in Nardacci and Associates (1982). The 1982 ANOVA results were different than all other years except 1976, when sample date effect was greater than station effect. The high amount of variability caused by date effect was attributed to the large number of Chironomus decorus group sp. collected on 24 May and during winter.

The results of ANCOVA on total number of organisms are presented in Tables 2.3-5 through 2.3-7. Results were similar to those discussed for Limnodrilus hoffmeisteri. Differences in slopes may be attributed to slight changes in the thermal and/or chemical make-up of the TMINS Discharge during plant operation and subsequent shutdown.

A comparison of monthly diversity (H') values in 1982 to the range of previous years is illustrated in Figure 2.3-12. H' values were above the range in five or six of the months at Stations 1A2, 11A1, and 11A2. Compared to 1981, the 1982 diversity was not as consistently above the range at the downstream stations.

From 1979 through 1981, monthly H' values at Station 1A2 were within the range most months (Nardacci and Associates 1980, 1981, 1982) yet in 1982 the H' values were above the range one-half the year.

The relative ranking of yearly diversity for the macroinvertebrate stations (1975 through 1982) is presented in Table 2.3-10. The relative rankings for 1982 were similar to 1981. As in other years, low diversity often corresponded with high density of Limnodrilus hoffmeisteri and the reverse (Table 2.3-4). Since 1981, Station 11A1 ranked second in diversity. Station 1A1, located upstream of the Discharge, was highest each year.

Spatial diversity and site (station) clustering using a single linkage dendrogram based on PSc of species composition are illustrated in Figure 2.3-13. In 1982, some trends for PSc and diversity were similar to other years. Since 1975, the lowest PSc was between Station 1A1 and all other stations. Since 1977, the greatest PSc was between

Station 11A1 and another station. Station diversities in 1982 were more similar than any other year. The narrow range between station diversity in 1982 was attributed to a more even distribution of Limnodrilus hoffmeisteri and Chironomus decorus group sp. populations among the stations relative to other years.

2.4 SUMMARY

In 1982, the lowest number of organisms were collected since 1974; annual diversity was highest and similar to the 1981 diversity. In general, 1982 results were much like those of 1981; relatively low density of Limnodrilus hoffmeisteri, relatively high density of Chironomus decorus group sp., and high diversity values at all stations combined relative to other years. These results were attributed to the 1980 drought.

Analysis of covariance performed on Limnodrilus hoffmeisteri densities showed a linear relationship between control Station 1A2 and each indicator station. ANCOVA showed a significant change in slopes, using control Station 1A2 as the independent variate and indicator Station 11A1 as the dependent variate, between years of plant operation (1975 through 1978) and those of plant shutdown (1979 through 1982). Differences in slopes may be related to slight changes in the thermal and/or chemical make-up of the TMINS Discharge.

Table 2.1-1

Location and description of macroinvertebrate stations.

Station Number	Location and Description
TM-AQI-1A1*	40° 09' 52" N, 76° 43' 26" W. North tip of Sand Beach Island, 30 to 75 m offshore. Water depth varied from 0.5 to 2.5 m. Substrate composed of very coarse to medium sand and silt. Coarse organic detritus and <u>Potamogeton crispus</u> were sometimes present.
TM-AQI-1A2	40° 09' 36" N, 76° 43' 30" W. Southwest St. Johns Island at mouth of channel between TMI and St. Johns Island, 1 to 15 m offshore. Water depth varied from 0.3 to 3.5 m. Substrate sometimes stratified ranging from silt and clay to gravel. In the absence of stratification most substrate composed of silt, clay, and fine sands. Organic detritus and trace amounts of oil present.
TM-AQI-11A1	40° 09' 09" N, 76° 43' 39" W. West shore of TMI, 10 to 25 m downstream from Discharge, 1 to 15 m offshore. Water depth ranged from 0.25 to 2.0 m. Substrate composed mostly of silt, clay, fine sands, and gravel. Organic detritus and trace amounts of oil present.
TM-AQI-11A2	40° 09' 07" N, 76° 43' 39" W. West shore of TMI, 75 to 90 m downstream from Discharge, 1 to 15 m offshore. Water depth varied from 0.25 to 2.0 m. Substrate composed of fine sands, silt, and clay. Some organic detritus and trace amounts of oil present.
TM-AQI-9B1	40° 08' 03" N, 76° 43' 33" W. West shore of TMI, 1975 m downstream from Discharge, 5 to 15 m offshore. Water depth varied from 0.5 to 2.25 m. Substrate composed of silt, clay, and fine sands. Some organic detritus and trace amounts of oil present.

* Prefix TM-AQI- deleted from all station numbers for discussion in text.

Table 2.1-2

Ranked substrate categories for 1982 macroinvertebrate data. Substrate categories are ranked left to right from most abundant to least abundant.

Rank	Substrate Categories
1	Silt/Clay
2	Silt
3	Silt/Clay, Fine Sand
4	Silt, Fine Sand
5	Silt/Clay, Fine Sand, Coarse Sand
6	Silt, Fine Sand, Coarse Sand
7	Silt/Clay, Coarse Sand, Fine Sand
8	Silt, Coarse Sand, Fine Sand
9	Silt/Clay, Coarse Sand
10	Silt, Coarse Sand
11	Fine Sand, Silt/Clay
12	Fine Sand, Silt
13	Fine Sand, Silt/Clay, Coarse Sand
14	Fine Sand, Silt, Coarse Sand
15	Fine Sand, Coarse Sand, Silt/Clay
16	Fine Sand, Coarse Sand, Silt
17	Fine Sand
18	Fine Sand, Coarse Sand
19	Coarse Sand, Silt/Clay
20	Coarse Sand, Silt
21	Coarse Sand, Silt/Clay, Fine Sand
22	Coarse Sand, Silt, Fine Sand
23	Coarse Sand, Fine Sand, Silt/Clay
24	Coarse Sand, Fine Sand, Silt
25	Coarse Sand, Fine Sand
26	Coarse Sand

Table 2.1-3

River flow (m^3/s) data for 0700 h obtained from the River Forecast Center (Harrisburg, Pennsylvania), January through December 1982.

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	683	1649	779	1898	810	1190	725	200	146	193	101	535
2	683	2074	773	2048	762	1147	1462	394	143	176	110	635
3	731	3116	790	2861	711	1312	1232	351	149	170	108	677
4	742	4618	722	3258	635	1490	1057	279	151	165	108	657
5	1040	6742	694	3796	609	1864	891	258	154	157	141	586
6	1654	3286	657	3456	555	2691	759	241	151	156	183	530
7	1892	2677	688	2946	518	5184	711	217	149	268	286	499
8	1836	2249	700	2433	490	5354	609	214	143	138	286	493
9	1694	1870	629	2031	484	3768	518	227	138	122	326	459
10	1442	1538	598	1790	476	2776	476	261	133	119	343	431
11	NA	1365	561	1643	493	2184	431	303	130	115	297	382
12	NA	1263	584	1637	572	1830	402	343	127	115	268	357
13	2074	1215	1105	1626	586	1561	394	303	122	115	248	334
14	1870	1093	1864	1654	544	1824	394	248	119	124	241	317
15	2000	1051	3626	1654	524	1898	394	224	115	133	265	306
16	1994	955	4419	1626	493	1612	371	207	112	133	258	314
17	2042	1003	3909	1595	444	1419	334	193	108	135	254	405
18	1615	1227	3541	1612	405	1572	220	183	108	127	237	640
19	1578	1448	3229	1955	394	1343	323	176	106	119	224	683
20	1756	1507	3173	2008	382	1654	306	167	108	115	227	646
21	1841	1397	3144	1904	371	1300	312	167	110	115	193	669
22	1819	1204	3144	1688	397	1096	317	161	110	112	214	620
23	1711	1167	3428	1456	402	943	391	153	119	117	241	555
24	1745	1153	3569	1289	428	827	354	151	127	117	231	507
25	1717	1232	3144	1167	524	720	317	164	133	117	279	473
26	1501	1161	2975	1068	816	700	297	167	133	122	394	459
27	1578	949	3456	943	949	646	357	200	141	135	448	476
28	1538	850	4266	972	895	586	248	217	183	122	473	592
29	1550		3683	935	875	524	254	173	217	130	465	997
30	1535		2771	870	892	603	251	157	207	104	484	980
31	1538		2201		1173		244	149		110		935

NA Not Available (Gauge broken).

Table 2.1-4

Macroinvertebrates taken from the Susquehanna River near Three Mile Island.

Porifera	<i>Sycon appendiculata</i> (D'Arbo)
Demospongiae	<i>Sycon</i> sp.
Spongiales	<i>Sycon</i> sp.
Spongiidae	<i>Sycon</i> sp.
Cnidaria	
Hydrusa	
Hydra	
Hydridae	
Hydra	
Trachylina	
Fasciidae	
<i>Craspedocystis swinhoei</i> Lankester	
Platyhelminthes	
Turbellaria	
Tricelidae	
Planariidae	
<i>Dugesia sigrisi</i> (Gillard)	
Nemertinea	
Nemertea	
Nemertea	
Tetrastemmatidae	
<i>Prorhynchus rubrus</i> (Leidy)	
Nematoda	
Acanthocephala	
Palaeoacanthocephala	
Echinorhynchida	
Echinorhynchidae	
<i>Leptorhynchoides thacatus</i> (Linton)	
Entoprocta	
Entoprocta	
Entoproctidae	
<i>Entoprocta gracilis</i> Leidy	
Bryozoa	
Phylactolaemata	
Crustatellidae	
<i>Crustatella ovata</i> Cuvier	
Lophodolidae	
<i>Lophodolus cartari</i> (Beatt)	
<i>Tectatella magnifica</i> (Leidy)	
Planatellidae	
<i>Planatella punctata</i> (Hancock)	
<i>Planatella spens</i> (Linnaeus)	
Gymnolaemata	
Ctenostomida	
Calucitellidae	
<i>Paludicella articulata</i> (Ehrenberg)	
Annelida	
Oligochaeta	
Plesiopora	
Enchytraeidae	
Toluidae	
<i>Artemesia lamondi</i> (Martin)	
<i>Artemesia unidentata</i> (Harman)	
<i>Chagastaster diaphanus</i> (Gruithuisen)	
<i>C. jamaei</i> von Baer	
<i>Cero digitata</i> (Muller)	
<i>C. flabelliger</i> Stephenson	
<i>C. lugens</i> (Muller)	
<i>C. leucostoma</i> Stephenson	
<i>C. communis</i> Fiquet	
<i>C. vitreus</i> Muller	
<i>C. cordalis</i> Fiquet	
<i>C. variabilis</i> Fiquet	
<i>Cochlicopa serpentina</i> (Muller)	
<i>Figuetella michiganensis</i> Hiltunen	
<i>Fristina leidy</i> Smith	
<i>F. synalica</i> Stephenson	
<i>Sycon appendiculata</i> (D'Arbo)	
<i>Sycon</i> sp.	
<i>Sycon tubicola</i> (Linn.)	
Turbellidae	
<i>Amphicelis limicola</i> Bretscher	
<i>A. piqueti</i> Kowalewski	
<i>A. piqueti</i> (Fiquet)	
<i>Branchiura swinhoei</i> Beudant	
<i>Limnodynastes</i> (Gruithuisen)	
<i>Limnodynastes cervix</i> Brinkhurst	
<i>L. clausenianus</i> Katze	
<i>L. hoffmeisteri</i> Claparede	
<i>L. spicatus</i> (Linn.)	
<i>L. ulkenianus</i> Claparede	
<i>Quaternaria jesus</i> (Linn.)	
<i>Q. multisetosus</i> (Smith)	
<i>Spiraspora nikolskii</i> (Linstock and Spindler)	
<i>Tonifex tubifex</i> (Muller)	
Trematoda	
Lobosomatidae	
Opisthoptera	
Spiracanthidae	
<i>Spiracanthus sinensis</i> Smith	
Branchiobdellida	
Polychaeta	
Etrantia	
Sabellidae	
<i>Mansuetia speciosa</i> Leidy	
Hirudinea	
Rhynchobdellida	
Classiphoniidae	
<i>Actinobdella inaequianulata</i> Moore	
<i>Helobdella elongata</i> (Castle)	
<i>H. fusca</i> (Castle)	
<i>H. stagnalis</i> (Linnaeus)	
<i>H. triseriata</i> (E. Blanchard)	
<i>Planorbella multiformis</i> Moore	
<i>P. nichalis</i> Sawyer and Shelley	
<i>P. parasitica</i> (Say)	
Piscicolidae	
<i>Nyctibdella lugubris</i> Leidy	
Pharyngobdellida	
Ergasilidae	
<i>Mooreobdella microstoma</i> (Moore)	
Arthropoda	
Arachnida	
Araneae	
Pisauridae	
<i>Dolomedes scriptus</i> Hentz	
<i>D. triton</i> (Walckenaer)	
Hydracarina	
Crustacea	
Branchiopoda	
Cladocera	
Ostracoda	
Copepoda	
Eucopepoda	
Lernaeidae	
<i>Lernaea</i> sp.	
Branchiura	
Argulidae	
<i>Argulus appendiculatus</i> Wilson	
<i>A. catorhini</i> Dana and Herrick	
Malacostraca	
Isopoda	
Asellidae	
<i>Asellus communis</i> Sav	
<i>Lirceus</i> sp.	
Amphipoda	
Crangonytidae	
<i>Crangonyx</i> sp.	
<i>Crangonyx</i> sp.	
<i>Stygobromus tenuis</i> group sp.	
<i>S. alleghaniensis</i> (Hollinger)	
Gammaridae	
<i>Gammarus fasciatus</i> Sav	

Table 1.1-4 continued.

Talitridae	<u>Hyalella arteca</u> (Saunders)
Decapoda	
Astacidae	<u>Cambarus bartoni</u> (Fabricius) <u>Orconectes obscurus</u> (Hagen) <u>O. rusticus</u> (Girard)
Insecta	
Collembola	
Ephemeroptera	
Siphonuridae	<u>Isopychia bicolor</u> (Walker) <u>Isopychia</u> sp. <u>Siphonurus</u> sp.
Baetidae	<u>Baetis brunneicolor</u> McDunnough <u>B. ephippialis</u> Traver <u>B. levisiana</u> McDunnough <u>Baetis</u> spp. <u>Cloeon</u> sp. <u>Pseudocloeon dubium</u> (Walsh) <u>Pseudocloeon</u> spp.
Heptageniidae	<u>Heptagenia lucidipennis</u> Clemens <u>Leucocuta nebulipennis</u> Walsh <u>Stenacron carolina</u> (Banks) <u>S. interpunctatum canadense</u> (Walker) <u>S. interpunctatum</u> (Say) <u>Stenonema mediopunctatum</u> (McDunnough) <u>S. pulchellum</u> (Walsh) <u>S. terminatum</u> (Walsh)
Leptophlebiidae	<u>Leptophlebia</u> sp. <u>Paraleptophlebia</u> sp.
Ephemereilidae	<u>Ephemereilla</u> (Ephemereilla) <u>needhami</u> McDunnough <u>E. (Eurylophella) bicolor</u> Clemens <u>E. (E.) temporalis</u> McDunnough <u>E. (E.) verisimilis</u> McDunnough <u>E. (Atractella) deficiens</u> Morvan
Tricorythidae	<u>Tricorythodes atratus</u> McDunnough <u>Tricorythodes</u> spp.
Caenidae	<u>Brachycercus lacustris</u> (Needham) <u>Caenis anceps</u> Traver <u>C. forcipata</u> McDunnough <u>Caenis</u> spp.
Baetiscidae	<u>Baetisca obesa</u> (Say) <u>Baetisca</u> spp.
Potamanthidae	<u>Potamanthus myops</u> group sp. <u>P. walkeri</u> Ide <u>P. verticis</u> (Say) <u>Potamanthus</u> spp.
Ephemeridae	<u>Ephemera varia</u> Eaton <u>Hexagenia atricaudata</u> McDunnough <u>H. limbata</u> Guerin <u>H. occulta</u> Walker <u>H. rigida</u> McDunnough
Polymitarcyidae	<u>Ephoron leukon</u> Willmann
Odonata	
Aeschnidae	<u>Anax junius</u> (Drury)
Gomphidae	<u>Dromogomphus spinosus</u> Selys <u>Gomphus</u> (<u>Arigomphus</u>) <u>villosipes</u> Selys <u>G. (Gomphus) vastus</u> Walsh <u>G. (Gomphus) lividus</u> Selys <u>G. (Stylurus) notatus</u> Rambur <u>G. (Stylurus) spiniceps</u> (Walsh) <u>Hagenia brevistylus</u> Selys <u>Diphogomphus rufinauiensis</u> (Walsh)
Macromiidae	<u>Macromia illinoensis</u> Walsh
Corduliidae	<u>Eutroica princeps</u> Hagen <u>Neurocordulia yanaseana</u> (Provancher)
Libellulidae	<u>Libellula luctuosa</u> Burmeister <u>L. lydie</u> Drury <u>L. michellei</u> Drury <u>Tachydiplax longipennis</u> (Burmeister) <u>Pantala flavescens</u> (Fabricius) <u>P. hymenaea</u> (Say) <u>Perithemis tenera</u> (Say) <u>Symphetrum vicinum</u> (Hagen) <u>Tramea lacerata</u> (Hagen)
Coleopterygidae	<u>Metagrion americanum</u> (Fabricius)
Coenagrionidae	<u>Argia apicalis</u> (Say) <u>A. moesta</u> (Hagen) <u>A. transata</u> (Hagen) <u>Enallagma civile</u> (Hagen) <u>E. exulans</u> (Hagen) <u>Ischnura verticalis</u> (Say) <u>Stenobothrus</u> sp.
Orthoptera	
Tridactylidae	<u>Tridactylus minutus</u> Scudder
Flecoptera	
Pteronarcidae	<u>Pteronarcys</u> sp.
Taminipterygidae	<u>Taminipteryx fasciata</u> (Burmeister) <u>Taminipteryx burkei</u> Ricker and Rose <u>T. maura</u> (Pictet) <u>T. nivalis</u> (Pictet)
Nemouridae	<u>Amphinemura delosa</u> (Ricker)
Leuctridae	<u>Leuctra</u> sp.
Capniidae	<u>Allocapnia granulata</u> (Clausen)
Perlidae	<u>Acronemura abnormis</u> (Newman) <u>Perlenta placida</u> (Hagen) <u>Phasgocophus capitata</u> (Pictet)
Perlodidae	<u>Isoperla bilineata</u> (Say)
Hemiptera	
Coriidae	<u>Sygma alierata</u> (Say) <u>S. modesta</u> (Abbott) <u>S. coriata calva</u> (Say)
Notonectidae	<u>Buenos murgitacea</u> Torre-Bueno <u>Notonecta undulata</u> Say
Pleidae	<u>Nephesa striola</u> (Fieber)
Belostomatidae	<u>Belostoma</u> sp.
Nepidae	<u>Nepa nigra</u> Herrich-Schaeffer
Gelastocoridae	<u>Gelastocoris oculatus</u> (Fabricius)
Gerridae	<u>Gerris argenticollis</u> Parshley <u>G. comatus</u> Drake and Hottes <u>G. conformis</u> (Uhler) <u>Metrobates hesperius</u> Uhler <u>Rheumatobates fluevi</u> Bergroth <u>Trepobates inermis</u> Usaki
Veliidae	<u>Microvelia americana</u> (Uhler) <u>Rhagovelia obesa</u> Uhler
Mesoveliidae	<u>Mesovelia muisansi</u> Whit

Table 2.14 continued.

Saldidae	<i>Microparvus</i> sp. <i>Pentacera ligata</i> (Say) <i>Saldula</i> sp.	Leiodae	<i>Amyrobya variegata</i> (Germar) <i>Dubiraphia bicinctata</i> (LeConte) <i>D. vittata</i> (Melibeina) <i>Macroporus glabratus</i> Say <i>Optoweryus festidius</i> LeConte <i>O. vittigerus</i> (Brown) <i>Salicinus latimaculatus</i> (LeConte) <i>Prometisella elegans</i> (LeConte) <i>Stenobius bicarinatus</i> LeConte <i>S. decoratus</i> Handerson <i>S. markali</i> Matshulskiy
Megaloptera		Chrysomelidae	<i>Romalia</i> sp.
Stialidae	<i>Stialis</i> sp.	Diptera	
Corydalidae	<i>Corydalus cornutus</i> (Linnaeus)	Tipulidae	<i>Antocha</i> sp. <i>Cryptota</i> sp. <i>Hesatoma</i> sp. <i>Helophorus</i> sp. <i>Pseudolimnophila</i> sp. <i>Tipula</i> (<i>Pterelachnusa</i>) sp. <i>Tipula</i> (<i>Limnophilina</i>) sp. <i>Tipula</i> sp.
Neuroptera		Psephenidae	<i>Psephenus</i> sp. <i>Psychoda</i> sp. <i>Telmatoxypus</i> sp.
Vespa	<i>Climacusa areolaris</i> (Neser)	Culicidae	<i>Aedes vexans</i> (Meigen)
Ichneumonidae	<i>Psychomyia flavida</i> Hagen	Chaoboridae	<i>Chaoborus punctipennis</i> (Say)
Palaenoptilidae	<i>Neuroclippia</i> sp. <i>Polycentropus cinereus</i> Hagen	Chironomidae	
Hydropsychidae	<i>Stomatopysche campyla</i> Ross <i>S. aperta</i> (Banks) <i>Stomatopysche serata</i> Ross <i>S. denra</i> Ross <i>S. phalerata</i> Hagen <i>S. valiana</i> Ross <i>Macronema carolina</i> (Banks) <i>M. zebratum</i> (Hagen) <i>Pentamyia flava</i> (Hagen) <i>Symphitopysche bifida</i> group sp. <i>S. nigra</i> (Hagen) <i>Symphitopysche</i> sp.	Tanypodinae	<i>Tanypus neopunctipennis</i> Sublette <i>T. punctipennis</i> Neigen <i>Procladius</i> (<i>Procladius</i>) <i>sublattei</i> Roback <i>P. (Psilodanymus) bellus</i> (Loew) <i>Psectrocladius</i> sp. <i>Clintanymus</i> cf. <i>pinguis</i> (Loew) <i>Coelotanympus scapularis</i> (Loew) <i>Madhaemera annulata</i> Say <i>A. cf. clintica</i> (Johannsen) <i>A. mallochii</i> Walley <i>A. cf. parajacta</i> Roback <i>A. cf. philosphagnus</i> <i>A. philosphagnus</i> Beck and Beck <i>Larid</i> sp. <i>Natarsia halmurens</i> (Macquart) <i>Natarsia</i> sp. A <i>Parametria</i> sp. <i>Thienemannimyia</i> group sp. <i>Thienemannimyia</i> cf. <i>gessig</i> (Waller) <i>Savralimvia</i> sp.
Glossosomatidae	<i>Protophila palus</i> (Ross)	Diamasinae	<i>Diamasa nivoriunda</i> (Fitch) <i>Sympotthastia</i> sp.
Hydroptilidae	<i>Hydroptilia speculata</i> Motton <i>H. zauseniana</i> Betten	Prodiamesinae	<i>Procladius olivaceus</i> (Neigen)
Limnophilidae	<i>Psychopysche subfasciata</i> (Say)	Orthocladinae	<i>Acilla</i> sp. <i>Arvophanocladus</i> sp. <i>Cardiocladius obscurus</i> (Johannsen) <i>Chaetocladius</i> sp. <i>Cricotopus</i> (<i>Cricotopus</i>) <i>bicinctus</i> group sp. <i>C. (Cricotopus) bicinctus</i> (Meigen) <i>C. (Cricotopus) sylvaticus</i> group sp. <i>C. (Cricotopus) prob. tremulus</i> (Linnaeus) <i>C. (Cricotopus) triangularis</i> (Macquart) <i>C. (Cricotopus) trifarius</i> Edwards <i>C. (Cricotopus) vierriensis</i> (Goetzgheuer) <i>C. (Cricotopus) cf. ornatus</i> (Meigen) <i>Diplocladius</i> sp. <i>Enkieliffella brehni</i> group sp. <i>E. breviculcar</i> group sp. <i>E. pseudomontana</i> group sp.
Leptoceridae	<i>Ceracles cancellata</i> (Betten) <i>C. flava</i> (Banks) <i>C. nepha</i> (Ross) <i>C. larispunctata</i> (Vernies) <i>Hyalocides sepulchralis</i> (Walker) <i>Neotopsyche exquisita</i> (Walker) <i>N. pavida</i> (Hagen) <i>Oecetis</i> sp.		
Leptoptera			
Petalidae	<i>Paraponyx</i> sp. <i>Petrophila</i> sp.		
Coleoptera			
Halictidae	<i>Halictus fasciatus</i> Aube <i>H. triopis</i> Say <i>Peltodytes duodecispunctatus</i> (Say)		
Dytiscidae	<i>Copelatus</i> sp. <i>Lilyus</i> sp. <i>Laccophilus</i> sp. <i>Liodessus fuscatus</i> (Crotch)		
Gyrinidae	<i>Dinemus discolor</i> Aube <i>D. hornii</i> Roberts <i>Gyrinus</i> sp.		
Helophoridae	<i>Helophorus</i> sp.		
Hydrophilidae	<i>Anaesena lachata</i> (Fabricius) <i>Berosus aculeatus</i> LeConte <i>Inochrus</i> sp. <i>Laccobius</i> sp. <i>Proplisterus lateralis nimbatus</i> (Say) <i>I. natator</i> D'Orchymont		
Psaphenidae	<i>Psaphenus herricki</i> (DeKay)		

Table 1.1-4 continued.

<u>Geothrocladius</u> sp.	Muscidae
<u>Heterotrissocladius chengi</u> Seether	<u>Fannia</u> sp.
<u>Hydrobaenus</u> sp.	<u>Lispe</u> sp.
<u>Mesocricotopus</u> sp.	Mellicerae
<u>Nanocladius</u> (<u>Nanocladius</u>) prob. <u>picior</u> Zetterstedt	Gastropoda
<u>N.</u> (<u>Nanocladius</u>) <u>crassicornus</u> Seether	Lianopidae
<u>N.</u> (<u>Nanocladius</u>) <u>distinctus</u> (Malloch)	Physidae
<u>N.</u> (<u>Nanocladius</u>) <u>minimus</u> n. sp.	<u>Physella heterostropha</u> (Say)
<u>Orthocladius</u> (<u>Euorthocladius</u>) <u>viviparis</u> Kieffer	Lymnaeidae
<u>O.</u> (<u>Orthocladius</u>) cf. <u>sorensi</u> (Roback)	<u>Lymnaea humilis</u> Say
<u>O.</u> (<u>Orthocladius</u>) nr. <u>mallochii</u> Kieffer	Pisnorbidae
<u>O.</u> (<u>Orthocladius</u>) <u>obumbratus</u> Johannsen	<u>Cyadulus curvus</u> (Say)
<u>O.</u> (<u>Orthocladius</u>) <u>oliveri</u> Sponis	<u>Pisnorbellia triviviva</u> (Say)
<u>Paramecricotenus</u> sp.	Ancylidae
<u>Pseudamittia</u> sp.	<u>Ferrissia rivularis</u> (Say)
<u>Amittia</u> sp.	<u>F. tarda</u> (Say)
<u>Tritenemennilla</u> nr. <u>fusca</u> (Kieffer)	Mesogastropoda
<u>T.</u> prob. <u>lena</u> Roback	Fleutneridae
<u>Tritenia bavarica</u> group sp.	<u>Elimia virginica</u> (Gmelin)
<u>T.</u> cf. <u>bavarica</u> sp. 1	<u>Leptoxis carinata</u> (Brugulere)
<u>T.</u> <u>discoloripes</u> group sp.	Valvatidae
Chironominae	<u>Valvata tricerinata</u> (Say)
<u>Chironomus decorus</u> Johannsen	Eithyniidae
<u>C.</u> <u>riparius</u> group sp.	<u>Eithynia tentaculata</u> (Linnaeus)
<u>Cladopelma amackerus</u> (Townes)	Hydrobiidae
<u>Cryptochironomus diarina</u> Townes	<u>Ampicula limosa</u> (Say)
<u>C.</u> <u>fulvus</u> group sp.	Viviparidae
<u>Cryptotendipes pseudotener</u> (Goetgheb-er)	<u>Campeloma decisa</u> (Say)
<u>Demicryptochironomus cuneatus</u> (Townes)	<u>Licopix subcarinata</u> Say
<u>Microtendipes neomodesius</u> (Malloch)	Pelecypoda
<u>D. nervosus</u> (Staecker) Type I	Eulamellibranchia
<u>D. nervosus</u> (Staecker) Type II	Unionidae
<u>Eudochironomus</u> cf. <u>subtendens</u> (Townes)	<u>Anodonta cataracta</u> (Say)
<u>E.</u> nr. <u>tendens</u> (Fabricius)	<u>A. imbecillus</u> Say
<u>Cryptotendipes</u> sp.	<u>Elliptio complanata</u> (Lightfoot)
<u>Harnischia curtilamelata</u> (Malloch)	<u>Lampsilis</u> sp.
<u>Microchironomus</u> sp.	<u>Lamigone subviridis</u> (Conrad)
<u>Microtendipes caducus</u> Townes	Heterodonts
<u>Parachironomus carinatus</u> (Townes)	Sphaeriidae
<u>P. monochromus</u> (Wulp)	<u>Psidium</u> spp.
<u>P. pectinatellae</u> (Dendy and Sublette)	<u>Sphaerium</u> spp.
<u>Pseudotendipes</u> sp.	
<u>Phaenopsectra</u> nr. <u>obediens</u> (Johannsen)	
<u>P. lypedilum nonvictum</u> (Walker)	
<u>P. fallax</u> (Johannsen)	
<u>P. halteralis</u> group sp.	
<u>P. illinoense</u> (Malloch)	
<u>P. laetum</u> (Meigen)	
<u>P. scalanum</u> group sp.	
<u>Stenochironomus</u> sp.	
<u>Stictochironomus</u> sp.	
<u>Tribelos jucundus</u> (Walker)	
<u>Cladotanytarsus</u> sp. 1	
<u>Rheotanytarsus distinctissimus</u> group sp.	
<u>R.</u> nr. <u>exiguus</u> (Johannsen)	
<u>Tanytarsus</u> nr. <u>buckleyi</u> Sublette	
<u>T.</u> <u>elucidus</u> ? (Walker)	
<u>T.</u> <u>glabrescens</u> group sp.	
<u>T.</u> <u>glabrescens</u> group ? sp. A	
<u>T.</u> <u>guertli</u> group sp.	
<u>Tanytarsus</u> group A	
Ceratopogoridae	
<u>Palpomyia</u> group sp.	
Simuliidae	
<u>Ectemnia</u> sp.	
<u>Simulium</u> (<u>Psilozia</u>) <u>vittatum</u> Zetterstedt	
Sciariidae	
Tabanidae	
<u>Chrysopa</u> sp.	
Empididae	
<u>Hemerodromia</u> sp.	
Sciomyzidae	
Dolichopodidae	
Ephydriidae	
<u>Hydrellia</u> sp.	

TABLE 2-2-3

NUMBERS AND WEIGHT IN MILLIGRAMS, NO WT, OF BENTHIC ORGANISMS PER PUNAR WHAR 152V 50 CM STATION IM-A23-141, APRIL 1962.
D-SHEDS INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

TIME	10 APRIL											
	STATION IM-A23-141											
	SUBSTRATE											
AIR TEMP (C)	20.0											
WATER TEMP (C)	18.0											
DISSOLVED OXYGEN (MG/L)	1.5											
SEC DIS (CM)	1.0											
RIVE DIS (CM)	1.0											
SUBSTRATE	SILT, CLAY, COARSE SAND, COARSE SAND, SILT, COAL, BITUMEN											
REPLICATE	A		B		C		D		E		F	
	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT
NEMATODA												
CRISTATELLA MUCEDD												
ARCHAETHA LUMONDI												
NAIS VAFIAE ILIIS												
FIGURELLA MICHIGANENSIS												
FRANCHELLA SCHUBERTI												
ILYODRILLUS THOMPSONI												
LIMNOCORILLUS HOKKAYDISTERI												
LIMNOCORILLUS SPP.												
MEGALOPTILA												
SPHARALDIA TASSIATA												
POTAMANTHUS SALICINUS												
POTAMANTHUS SPP.												
HERAGENIA SPP.												
HYDROPSYCHE PHALERATA												
DECAPODA												
STREPTALDIA SPP.												
PHOTILACTUS SPP.												
CHIRONOMUS DEKKERUS												
CHIRONOMUS SPP.												
CRYPTOCHIETUS FLAVUS												
CRYPTOCHIETUS SPP.												
PHACNOCENTRUS CUNTATUS												
PHACNOCENTRUS SPP.												
POLYDORUS HALTERBERGERI												
POLYDORUS SPP.												
POLYDORUS SPP.												
TANYTARUS GIBBERUS												
ELMIRA VIRGINICA												
PHYSICUM SPP.												
SPHARALDIA SPP.												
TOTAL ORGANISMS												
TOTAL TAXA												
TOTAL WEIGHT	113.1		79.1		18.8		62.0		15.8		8.0	

P QUANTIFICATION NOT POSSIBLE; PENDING ORGANISM PRESENT.

TABLE 2-2-4

NUMBERS AND WEIGHT IN MILLIGRAMS, NO WT, OF BENTHIC ORGANISMS PER PUNAR WHAR 152V 50 CM STATION IM-A23-141, MAY 1962.
D-SHEDS INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

TIME	10 MAY											
	STATION IM-A23-141											
	SUBSTRATE											
AIR TEMP (C)	20.0											
WATER TEMP (C)	18.0											
DISSOLVED OXYGEN (MG/L)	1.5											
SEC DIS (CM)	1.0											
RIVE DIS (CM)	1.0											
SUBSTRATE	SILT, CLAY, COARSE SAND, COARSE SAND, SILT, COAL, BITUMEN											
REPLICATE	A		B		C		D		E		F	
	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT
NEMATODA												
CRISTATELLA MUCEDD												
ARCHAETHA LUMONDI												
NAIS VAFIAE ILIIS												
FIGURELLA MICHIGANENSIS												
FRANCHELLA SCHUBERTI												
ILYODRILLUS THOMPSONI												
LIMNOCORILLUS HOKKAYDISTERI												
LIMNOCORILLUS SPP.												
MEGALOPTILA												
SPHARALDIA TASSIATA												
POTAMANTHUS SALICINUS												
POTAMANTHUS SPP.												
HERAGENIA SPP.												
HYDROPSYCHE PHALERATA												
DECAPODA												
STREPTALDIA SPP.												
PHOTILACTUS SPP.												
CHIRONOMUS DEKKERUS												
CHIRONOMUS SPP.												
CRYPTOCHIETUS FLAVUS												
CRYPTOCHIETUS SPP.												
PHACNOCENTRUS CUNTATUS												
PHACNOCENTRUS SPP.												
POLYDORUS HALTERBERGERI												
POLYDORUS SPP.												
POLYDORUS SPP.												
TANYTARUS GIBBERUS												
ELMIRA VIRGINICA												
PHYSICUM SPP.												
SPHARALDIA SPP.												
TOTAL ORGANISMS												
TOTAL TAXA												
TOTAL WEIGHT	13.7		20.0		4.1		21.5		19.0		53.0	

P QUANTIFICATION NOT POSSIBLE; PENDING ORGANISM PRESENT.
* IMMATURE TUBE-ACID WITH PAPILLOFORM CHARACTER.

TABLE 2-2-9

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB 1529 50 CM) AT STATION TM-421-1A1, OCTOBER 1982. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE TIME AIR TEMP (C) WATER TEMP (C) DISSOLVED OXYGEN (MG/L) PH SECCHI DISC (CM) RIVER STAGE (M) SUBSTRATE	OCTOBER								OCTOBER							
	COARSE SAND, SILT, DETRITUS				FINE SAND, SILT, DETRITUS				COARSE SAND, SILT, DETRITUS				FINE SAND, SILT, DETRITUS			
	A		B		C		D		A		B		C		D	
NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	
TURBELLARIA																
NEMATODA																
ARCTONAIIS LOMONDI																
CHAETOCARUS LOMONDI																
PRISTINA SYNCLITES																
AULODORILUS PIGUETI																
LIMNODORILUS HOFFMEISTERI																
LIMNODORILUS UDEKEMIANUS																
LIMNODORILUS SPP.																
DIPTERODORILUS MULTISEIOSUS																
IMM. TUB. PCAP. CHAETAE *																
ACTINODORILUS INEQUILANULATA																
HELOBEELLA FUSCOA																
GAMMARUS FASCIATUS																
HEXAGENIA SPP.																
OLBIRAPHIA SPP.																
PROCLADUS SPP.																
ARLABESMYIA CF. CINCTYPES																
CHIRONOMUS DECCORUS GR.																
CRYPTOCHIRONOMUS BLADINA																
CRYPTOCHIRONOMUS POLVUS GR.																
DENICYPPOCHIRONOMUS CF. CUNEATUS																
POLYPTERODILUM HALTERPALE GR.																
POLYPTERODILUM SCALAGNUM GR.																
TANYTARSUS GUERLUS GR.																
ELMIA VIRGINICA																
ELMIA SPP.																
SPINACIUM SPP.																
TOTAL ORGANISMS	47		31		13		44		13		20		22		16	
TOTAL TAXA	12		9		12		9		10		11		11		12	
TOTAL WEIGHT	244.7		127.4		100.9		239.6		37.6		69.5		140.1		44.5	

* IMMATURE TUBIFICID WITH CAPILLIFORM CHAETAE.

TABLE 2-2-10

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB 1529 50 CM) AT STATION TM-421-1A1, NOVEMBER 1982. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE TIME AIR TEMP (C) WATER TEMP (C) DISSOLVED OXYGEN (MG/L) PH SECCHI DISC (CM) RIVER STAGE (M) SUBSTRATE	1 NOVEMBER								15 NOVEMBER							
	COARSE SAND, SILT, DETRITUS				FINE SAND, SILT, DETRITUS				COARSE SAND, SILT, DETRITUS				FINE SAND, SILT, DETRITUS			
	A		B		C		D		A		B		C		D	
NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	
TURBELLARIA																
NEMATODA																
CRISTATELLA WILCOX																
LOPHOPODILLA CARTERI																
ARCTONAIIS LOMONDI																
GERO SP. (DIGITATA)																
MAIS ELINGUIS																
MAIS VARIABILIS																
PILOCELLA MICHIGANENSIS																
PRISTINA SYNCLITES																
SMELDIA JOSIAE																
AULODORILUS LIMNORILUS																
AULODORILUS PIGUETI																
BRANCHIURA SOWERBYI																
LIMNODORILUS HOFFMEISTERI																
LIMNODORILUS UDEKEMIANUS																
LIMNODORILUS SPP.																
DIPTERODORILUS MULTISEIOSUS																
IMM. TUB. PCAP. CHAETAE *																
GAMMARUS FASCIATUS																
HEXAGENIA SPP.																
OLBIRAPHIA SPP.																
PROCLADUS SPP.																
ARLABESMYIA CF. CINCTYPES																
CHIRONOMUS DECCORUS GR.																
CRYPTOCHIRONOMUS BLADINA																
CRYPTOCHIRONOMUS POLVUS GR.																
DENICYPPOCHIRONOMUS CF. CUNEATUS																
TANYTARSUS GUERLUS GR.																
ELMIA VIRGINICA																
ELMIA SPP.																
SPINACIUM SPP.																
TOTAL ORGANISMS	196		237		188		157		161		164		171		107	
TOTAL TAXA	9		9		12		9		10		11		11		12	
TOTAL WEIGHT	157.1		96.6		162.3		93.2		179.3		74.4		46.0		49.4	

P QUANTIFICATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.
* IMMATURE TUBIFICID WITH CAPILLIFORM CHAETAE.

TABLE 2-2-11

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (529 SQ CM) AT STATION TH-421-1A3, DECEMBER 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	2 JANUARY 1962												20 DECEMBER 1962											
	SILT, FINE SAND, COARSE SAND, COAL, DETRITUS												SILT, FINE SAND, COARSE SAND, COAL, DETRITUS											
	A			B			C			D			A			B			C			D		
TIME	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT		
AIR TEMP (C)	10.0												10.0											
WATER TEMP (C)	10.0												10.0											
DISSOLVED OXYGEN (MG/L)	10.0												10.0											
SECCHI DISC (CM)	10.0												10.0											
RIVER STAGE (FT)	10.0												10.0											
SUBSTRATE	SILT, FINE SAND, COARSE SAND, COAL, DETRITUS												SILT, FINE SAND, COARSE SAND, COAL, DETRITUS											
REPLICATE	A												B											
CRISTATELLA MUCEDD																								
ARCYONALIS LOMONDI																								
BRANCHIURA SOMERSBYI																								
LYNCHORILLUS CLAPAREDEIANUS																								
LYNCHORILLUS UDEKEMIANUS																								
HYALODRELLA SPP.																								
HYALODRELLA SPP.																								
HEXAGENIA SPP.																								
PROCLADUS SPP.																								
COELOGANYRUS SPP.																								
ABLABESMYIA CP. CINCTIPES																								
CRYPTOCHIRONOMUS FLAVINA																								
CRYPTOCHIRONOMUS FULVUS GP																								
DICRITENDIPES NEOMODIUS GP																								
GLYPHOTENDIPES SPP.																								
LYNNAEA SPP.																								
SPHAIERUM SPP.																								
TOTAL ORGANISMS	152			17.0			41.7			2.0			79.0			74.7			56.6			127		
TOTAL TAXA	152			17.0			41.7			2.0			79.0			74.7			56.6			127		
TOTAL WEIGHT	152			17.0			41.7			2.0			79.0			74.7			56.6			127		

P QUANTIFICATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.

* EMPHATIC PURIFICATION WITH CAPILLIFORM CHAETAE.

TABLE 2-2-12

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (529 SQ CM) AT STATION TH-421-1A2, JANUARY 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	6 JANUARY 1962											
	SILT, FINE SAND, COARSE SAND, COAL, DETRITUS											
	A			B			C			D		
TIME	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT
AIR TEMP (C)	10.0											
WATER TEMP (C)	10.0											
DISSOLVED OXYGEN (MG/L)	10.0											
SECCHI DISC (CM)	10.0											
RIVER STAGE (FT)	10.0											
SUBSTRATE	SILT, FINE SAND, COARSE SAND, COAL, DETRITUS											
REPLICATE	A											
CRISTATELLA MUCEDD												
ARCYONALIS LOMONDI												
BRANCHIURA SOMERSBYI												
LYNCHORILLUS CLAPAREDEIANUS												
LYNCHORILLUS UDEKEMIANUS												
HYALODRELLA SPP.												
HYALODRELLA SPP.												
HEXAGENIA SPP.												
PROCLADUS SPP.												
COELOGANYRUS SPP.												
ABLABESMYIA CP. CINCTIPES												
CRYPTOCHIRONOMUS FLAVINA												
CRYPTOCHIRONOMUS FULVUS GP												
DICRITENDIPES NEOMODIUS GP												
GLYPHOTENDIPES SPP.												
LYNNAEA SPP.												
SPHAIERUM SPP.												
TOTAL ORGANISMS	20			18			7			20		
TOTAL TAXA	20			18			7			20		
TOTAL WEIGHT	0.1			1.6			2.2			12.1		

P QUANTIFICATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.

TABLE 2-12-54

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PUNGE URAN (529 SQ CM) AT STATION TH-421-142, APRIL 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	22 APRIL				29 APRIL			
	1962				1962			
	1962				1962			
AIR TEMP (C)	13.4				13.1			
WATER TEMP (C)	13.4				13.1			
DISSOLVED OXYGEN (MG/L)	1.1				1.1			
PH	7.3				7.3			
SECCHI DISC (CM)	33.0				33.0			
RIVER STAGE (M)	4.0				4.0			
SUBSTRATE	FINE SAND, SILT, COARSE SAND, GRAVEL				FINE SAND, SILT, COARSE SAND, GRAVEL			
REPLICATE	FINE SAND, SILT				FINE SAND, SILT			
	A	B	C	D	A	B	C	D
	NO	WT	NO	WT	NO	WT	NO	WT
NEBERTINEA	..	..	..	..	..	..	..	..
NEMATODA	..	..	..	..	..	..	..	..
LIPNATICOLA GRACILIS	..	..	..	..	..	..	..	..
CRISTATILLA MUCEDD	..	..	..	..	..	..	..	..
PNCMYTRAZIDAE	..	..	..	..	..	..	..	..
AIALORILLUS FLURISSETIA	..	..	..	..	..	..	..	..
BRANCHIURA SCHWELBYI	..	..	..	..	..	..	..	..
LUDORILLUS TEMPLITON	..	..	..	..	..	..	..	..
LIMNOCORILLUS LAPAGEDE TANUS	..	..	..	..	..	..	..	..
LIMNOCORILLUS HOFFMEISTERI	..	..	..	..	..	..	..	..
LIMNOCORILLUS UDEKEMIANUS	..	..	..	..	..	..	..	..
LIMNOCORILLUS SPP.	..	..	..	..	..	..	..	..
REBAUPLE	..	..	..	..	..	..	..	..
SAMMARSUS FASCITATUS	1	5.3	52	59.1	..	..	..	..
SIRDUS SPP.	..	..	..	..	..	..	..	..
LUBRAPHIA SPP.	..	..	..	..	..	..	..	..
OPTIOSERVUS SPP.	..	..	..	..	..	..	..	..
STENELMIS SPP.	..	..	..	..	..	..	..	..
SPOTTEA SPP.	..	..	..	..	..	..	..	..
TIPULA (YAMATOTIPULA) SP.	..	32.7	..	..	..	..	..	..
TIPULA SPP.	..	..	..	..	..	..	..	..
HYDROSAENUS SPP.	..	..	..	..	..	..	..	..
ORTHOCLADUS TEURTHOCLADUSI SP	..	..	..	..	..	..	..	..
SWITZIA SPP.	..	..	..	..	..	..	..	..
CHIRONOMUS DECORUS GR	..	1.6	9	8.7	..	..	..	..
CHIRONOMUS RIPARIUS GR	..	..	..	..	..	..	..	..
CRYPTOCHIRONOMUS FLAVUS GR	..	..	..	..	..	..	..	..
CRYPTOCHIRONOMUS FLAVUS GR	..	..	..	..	..	..	..	..
PHANERSECTRA NR. OBTECTENS	..	..	..	..	..	..	..	..
POLYPEDILUM LATTUM	..	..	..	..	..	..	..	..
POLYPEDILUM CALAENUM GR	..	..	..	..	..	..	..	..
STENOCHIRONOMUS SPP.	..	..	..	..	..	..	..	..
PALPOMYIA GR	..	..	..	..	..	..	..	..
EMBIIDAE	..	..	..	..	..	..	..	..
POLYHOPODIDAE	..	..	..	..	..	..	..	..
PLATIA VYPOLYNICA	..	..	..	..	..	..	..	..
PISIDIUM SPP.	..	..	..	..	..	..	..	..
TOTAL ORGANISMS	30	74	26	89	117	105	65	127
TOTAL TAXA	10	10	5	8	10	10	10	14
TOTAL WEIGHT	32.6	67.8	9.1	76.3	92.4	65.9	42.1	69.8

QUANTIZATION NOT POSSIBLE; DASHES ORGANISM PRESENT.

TABLE 2-2-15

NUMBERS AND WEIGHT IN MILLIGRAMS, NO WT, OF BENTHIC ORGANISMS PER PONAR GRAB 1529 SQ CM AT STATION TM-421-1A2, MAY 1982. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE TIME AIR TEMP (C) WATER TEMP (C) DISSOLVED OXYGEN (MG/L) SECCHI DISC (CM) RIVER STAGE (M) SUBSTRATE	10 MAY				21 MAY				22 MAY							
	SILT, FINE SAND, COAL, DETRITUS				SILT, FINE SAND, COAL, DETRITUS				SILT, FINE SAND, COAL, DETRITUS							
	A	B	C	D	A	B	C	D	A	B	C	D				
REPLICATE	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT
NEMATODA																
CRISTATELLA MUCEDO																
PTICINATELLA MAGNIFICCA																
BRANCHIURA SOMERBYI																
LIMNOCORILLUS CLAPAREDEIANUS																
LIMNOCORILLUS HOFFMEISTERI																
LIMNOCORILLUS UDEKEMIANUS																
LIMNOCORILLUS SPP.																
IMM. TUB. / CAP. CHAETAE *																
HEMADRILE																
ORDELLA ELONGATA																
EMORDELLIGAE																
GAMMARUS FASCICATUS																
HYDROPSYCHE SPP.																
HYDROPSYCHE PHALGATA																
CARDIOLADIUS OBSCURUS ?																
CHIRONOMUS DECORUS GR																
CHIRONOMUS SPP.																
TOCHIRONOMUS BLARINA																
PHENOPSECTRA NO. OBEIENSIS																
POLYPEDILUM CONVICTUM																
POLYPEDILUM HALTERALE GR																
POLYPEDILUM SCALANUM GR																
HEMENDROMIA SP.																
HEMENDROMIA SPP.																
PARATENDIPUS SPP.																
TOTAL ORGANISMS	166		137		68		10		170		311		561		759	
TOTAL TAXA	17		18		18		10		8		4		0		7	
TOTAL WEIGHT	119.2		79.7		77.8		57.0		150.1		148.4		281.8		251.0	

P QUANTITATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.
* IMMATURE TUBIFICID WITH CAPILLIFORM CHAETAE.

TABLE 2-2-16

NUMBERS AND WEIGHT IN MILLIGRAMS, NO WT, OF BENTHIC ORGANISMS PER PONAR GRAB 1529 SQ CM AT STATION TM-421-1A2, JUNE 1982. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE TIME AIR TEMP (C) WATER TEMP (C) DISSOLVED OXYGEN (MG/L) SECCHI DISC (CM) RIVER STAGE (M) SUBSTRATE	10 JUNE				21 JUNE											
	FINE SAND, SILT, COAL, DETRITUS				SILT, FINE SAND, COAL, DETRITUS											
	A	B	C	D	A	B	C	D								
REPLICATE	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT				
NEMATODA																
CRISTATELLA MUCEDO																
PTICINATELLA MICHIGANENSIS																
BRANCHIURA SOMERBYI																
LIMNOCORILLUS CERVIK																
LIMNOCORILLUS HOFFMEISTERI																
LIMNOCORILLUS UDEKEMIANUS																
LIMNOCORILLUS SPP.																
IMM. TUB. / CAP. CHAETAE *																
HEMADRILE																
ORDELLA ELONGATA																
EMORDELLIGAE																
GAMMARUS FASCICATUS																
HYDROPSYCHE SPP.																
HYDROPSYCHE PHALGATA																
CARDIOLADIUS OBSCURUS ?																
CHIRONOMUS DECORUS GR																
CHIRONOMUS SPP.																
TOCHIRONOMUS BLARINA																
PHENOPSECTRA NO. OBEIENSIS																
POLYPEDILUM CONVICTUM																
POLYPEDILUM HALTERALE GR																
POLYPEDILUM SCALANUM GR																
HEMENDROMIA SP.																
HEMENDROMIA SPP.																
PARATENDIPUS SPP.																
TOTAL ORGANISMS	48		45		40		123		189		71		101		51	
TOTAL TAXA	6		7		2		10		8		4		6		4	
TOTAL WEIGHT	15.6		16.7		55.2		46.7		42.0		15.4		16.2		14.5	

P QUANTITATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.
* IMMATURE TUBIFICID WITH CAPILLIFORM CHAETAE.

TABLE 2-2-23

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (529 50 CM) AT STATION TM-421-1181, JANUARY 1982. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	1 JANUARY							
	A				B			
	NO	WT	NO	WT	NO	WT	NO	WT
AIR TEMP (C)	1.0							
WATER TEMP (C)	1.0							
DISSOLVED OXYGEN (MG/L)	1.0							
SECCHI DISC (CM)	1.0							
RIVER STAGE (M)	1.0							
SUBSTRATE	SILT, FINE SAND, GRAVEL, DETRITUS							
REPLICATE	A		B		C		D	
REMATODC								
URMATELLA GRACILIS								
PERINATELLA MAGNIFICA								
EMPHYTRACHEAL								
NAIS BRETSCHEI								
SLABINA APPENDICULATA								
WALPA MOBILIS								
LIMNODRILUS HOFFMEISTERI								
LIMNODRILUS VOEKERIANUS								
LIMNODRILUS SPP.								
IMM. TUB. CAP. CHAETAT W								
HEPARILL								
HEPARIDELLA ELONGATA								
SYNCHONOUS A. SPP. W								
BAMBARUS PARSII								
HEBAEIA SPP.								
ORPHANIDIA SPP.								
EMBLADIUS SPP.								
CHICOTOPUS ORTHOCLEIDIUS SP.								
EMLEPPERIELLA BREVICALCAR OR								
EMLEPPERIELLA SPP.								
DIPTOTENDIPES NEOHOODESTYS								
DIPTOTENDIPES SPP.								
PLANTIA VIRGINICA								
PISIDIUM SPP.								
TOTAL ORGANISMS	20	3.0	20	13.0	150	15.0	18	1.8
TOTAL WEIGHT	8.8	144.8	67.1	73.9				

P QUANTIZATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.

TABLE 2-2-24

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (529 50 CM) AT STATION TM-421-1181, MARCH 1982. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	8 MARCH								31 MARCH							
	A				B				C				D			
	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT		
AIR TEMP (C)	11.0								11.0							
WATER TEMP (C)	11.0								11.0							
DISSOLVED OXYGEN (MG/L)	11.0								11.0							
SECCHI DISC (CM)	11.0								11.0							
RIVER STAGE (M)	11.0								11.0							
SUBSTRATE	SILT, CLAY, FINE SAND, GRAVEL, DETRITUS								SILT, FINE SAND, CLAY, GRAVEL, DETRITUS							
REPLICATE	A		B		C		D		A		B		C		D	
REMATODC																
URMATELLA GRACILIS																
PERINATELLA MAGNIFICA																
EMPHYTRACHEAL																
NAIS BRETSCHEI																
SLABINA APPENDICULATA																
WALPA MOBILIS																
LIMNODRILUS HOFFMEISTERI																
LIMNODRILUS VOEKERIANUS																
LIMNODRILUS SPP.																
IMM. TUB. CAP. CHAETAT W																
HEPARILL																
HEPARIDELLA ELONGATA																
SYNCHONOUS A. SPP. W																
BAMBARUS PARSII																
HEBAEIA SPP.																
ORPHANIDIA SPP.																
EMBLADIUS SPP.																
CHICOTOPUS ORTHOCLEIDIUS SP.																
EMLEPPERIELLA BREVICALCAR OR																
EMLEPPERIELLA SPP.																
DIPTOTENDIPES NEOHOODESTYS																
DIPTOTENDIPES SPP.																
PLANTIA VIRGINICA																
PISIDIUM SPP.																
TOTAL ORGANISMS	9	2.7	7	1.9	8	1.0	10	1.0	4	1.0	6	1.0	10	1.0	10	1.0
TOTAL WEIGHT	0.0	91.9	1.9	0.0	18.9	1.7	0.0	32.1								

P QUANTIZATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.

W MATRICE SUSPECTED WITH CAPILLIFORM CHAETAT

W NEW SPECIES (W. SPP.?) REPRESENTS ONE OF THE W SPECIES.

TABLE 2.2-27

NUMBER OF ORGANISMS PER MILLIGRAM AND WEIGHT OF BENTHIC ORGANISMS PER POUND DRY WEIGHT OF SOIL AT STATION IN-423-11611 JUNE 1962.

REPLICATE	SILT, FINE SAND, SILT & CLAY								CLAY, SILT & FINE SAND							
	A		B		C		D		A		B		C		D	
	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT
TIME	1.0	0.1	1.0	0.1	1.0	0.1	1.0	0.1	1.0	0.1	1.0	0.1	1.0	0.1	1.0	0.1
WATER TEMP	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
DISSOLVED OXYGEN	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
PH	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
DEPTH	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
SOIL TYPE	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT	SILT
ORGANISM																
TOTAL ORGANISMS	310		303		183		177		103		36		187		187	
TOTAL WEIGHT	455.0		424.0		109.0		188.0		137.3		25.0		252.0		193.0	
* QUANTITIES OF ORGANISMS WHICH ARE VERY RARE OR UNUSUAL ARE INDICATED BY SMALL NUMBERS.																
* ORGANISMS WHICH ARE NOT IDENTIFIED TO SPECIES ARE INDICATED BY "X".																

TABLE 2.0-31

NUMBERS AND WEIGHT IN MILLIGRAMS, NO WT, OF BENTHIC ORGANISMS PER PUNAR GRAB 152N 50 CM AT STATION TM-621-11A1, OCTOBER 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

SITE	OCTOBER 1962				OCTOBER 1962				
	STATION TM-621-11A1				STATION TM-621-11A1				
	NO	WT	NO	WT	NO	WT	NO	WT	
TEMP (C)	18.0								
WATER TEMP (C)	18.0								
DISSOLVED OXYGEN (MG/L)	10.0								
SECCHI DISC (CM)	41.0								
RIVER STAGE (CM)	25.4								
SLURRY STATE	SILT, COARSE SAND, DETRITUS								
REPLICATE	A		B		C		D		
TIME (H: M)	11:00								
URBATELLA CRACILIS	1	0.1	1	0.1	1	0.1	1	0.1	
CRISTATELLA MUCCOLO									
ACTINELLA MAGNIFICA									
ACTINELLA LOMONDI									
SPECIARIA YOSINAE									
LITHODIUM HOKKENIANSIS									
LITHODIUM SPP.	48	7.7	2	0.2	11	2.4	6	1.3	
NEBARDIA									
NEBARDIA ELONGATA									
SARANUS FACILIATUS									
OMPHALUS SPINICEPS									
OMPHALUS SPP.									
PROCLADUS SPP.									
CALDIANUS SCAPULARIS									
CHIRONOMUS SPECIOSUS	36	3.2	26	4.7	31	7.8	NO	6.5	
CHIRONOMUS SPP.							17	36.3	
COCHIRONOMUS FLUVIUS							24	6.8	
COCHIRONOMUS SPP.							14	51.0	
TANYTARUS LUNICULUS								52	16.2
TANYTARUS SPP.									
PHYLLOPHAGUS									
PHYLLOPHAGUS NICA	100	6	71	1					
PHYLLOPHAGUS SPP.									
SPHAIERUM SPP.	3	1.4			4	2.2			
TOTAL ORGANISMS	157	11	87	10	110	19	26	14	
TOTAL WEIGHT	115.5		88.1		NO WT	25.9	228.7	531.9	

* QUANTIFICATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.
 * THRESHOLD WEIGHT FOR IDENTIFICATION.
 * NEW SPECIES IN SPP. 11 REPRESENTS ONE OF THREE NEW SPECIES.

TABLE 2.2-32

NUMBERS AND WEIGHT IN MILLIGRAMS, NO WT, OF BENTHIC ORGANISMS PER PUNAR GRAB 152N 50 CM AT STATION TM-621-11A1, NOVEMBER 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

SITE	1 NOVEMBER				15 NOVEMBER			
	STATION TM-621-11A1				STATION TM-621-11A1			
	NO	WT	NO	WT	NO	WT	NO	WT
TEMP (C)	17.0							
WATER TEMP (C)	17.0							
DISSOLVED OXYGEN (MG/L)	10.0							
SECCHI DISC (CM)	41.0							
RIVER STAGE (CM)	25.4							
SLURRY STATE	SILT, COARSE SAND, DETRITUS				SILT, FINE SAND, COARSE SAND, GRAVEL, DETRITUS			
REPLICATE	A		B		C		D	
URBATELLA CRACILIS	8	6.0	10	6.6			3	0.3
CRISTATELLA MUCCOLO								
ACTINELLA MAGNIFICA								
ACTINELLA LOMONDI								
SPECIARIA YOSINAE								
LITHODIUM HOKKENIANSIS								
LITHODIUM SPP.	26	7.24	27	8.9	11	2.4	6	1.3
NEBARDIA								
NEBARDIA ELONGATA								
SARANUS FACILIATUS								
OMPHALUS SPINICEPS								
OMPHALUS SPP.								
PROCLADUS SPP.								
CALDIANUS SCAPULARIS								
CHIRONOMUS SPECIOSUS	48	21.9	17	7.8	26	12.1	45	23.5
CHIRONOMUS SPP.							22	15.4
COCHIRONOMUS FLUVIUS								
COCHIRONOMUS SPP.								
TANYTARUS LUNICULUS								
TANYTARUS SPP.								
PHYLLOPHAGUS								
PHYLLOPHAGUS NICA								
PHYLLOPHAGUS SPP.								
SPHAIERUM SPP.								
TOTAL ORGANISMS	97	38.8	66	10	119	24	94	14
TOTAL WEIGHT	38.8		26.3		61.2		50.7	110.0

* QUANTIFICATION NOT POSSIBLE; DENOTES ORGANISM PRESENT.

TABLE 2.2-11

NUMBERS AND WEIGHTS IN MILLIGRAMS, NO. WT. OF LENTHIC ORGANISMS PER PONAR GRAB 1520 50 CM AT STATION TM-42-11A1, DECEMBER 1967.

DATE	8 DECEMBER				18 DECEMBER			
	SILT, FINE SAND, CLAY:				SILT, FINE SAND, CLAY:			
	A		B		C		D	
NO	WT	NO	WT	NO	WT	NO	WT	
REPLICATE								
1	1	0.9					0.2	
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
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93								
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95								
96								
97								
98								
99								
100								
TOTAL ORGANISMS	140	258	109	85	208	297	108	
TOTAL WEIGHT	66.0	217.7	131.7	38.8	116.0	189.3	167.4	

TABLE 2.2-12

NUMBERS AND WEIGHTS IN MILLIGRAMS, NO. WT. OF LENTHIC ORGANISMS PER PONAR GRAB 1520 50 CM AT STATION TM-42-11A2, JANUARY 1967.

DATE	8 JANUARY			
	SILT, FINE SAND, CLAY:			
	A		B	
NO	WT	NO	WT	
REPLICATE				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
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93				
94				
95				
96				
97				
98				
99				
100				
TOTAL ORGANISMS	68	73	142	88
TOTAL WEIGHT	297.0	1559.7	121.7	70.8

TABLE 2-2-35

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (50 CM) AT STATION TM-421-1142, MARCH 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	11 MARCH				11 MARCH			
	CLAY, FINE SAND, SILT, DETRITUS				CLAY, SILT, FINE SAND, COARSE DETRITUS			
	NO	WT	NO	WT	NO	WT	NO	WT
11 MARCH								
WATER TEMP (C)								
WATER TEMP (C)								
DISSOLVED OXYGEN (MG/L)								
PH								
SECCHI DISC (CM)								
BIOWAGE STAGE (M)								
SUBSTRATE								
REPLICATE								
MARENZELLERIA								
MARENZELLERIA								
MARENZELLERIA GRACILIS								
MARENZELLERIA SOMMERBYI								
MARENZELLERIA CLAPAREDEIANUS								
MARENZELLERIA HOFFMEYERII								
MARENZELLERIA UDEKEMIANUS								
MARENZELLERIA SPP.								
MARENZELLERIA MULTISETOSUS								
MARENZELLERIA ELONGATA								
MARENZELLERIA FALSIATUS								
MARENZELLERIA SPP.								
MARENZELLERIA BREVICALCAP BR								
MARENZELLERIA DIODUS GR								
MARENZELLERIA FULVUS GR								
MARENZELLERIA BREVIENS								
MARENZELLERIA VIRGINICA								
MARENZELLERIA SPP.								
TOTAL ORGANISMS	14		43		55		48	
TOTAL BIOWAGE	0		2		10		10	
TOTAL WEIGHT	0.0	8.8	31.4	0.9	10.8	33.0	19.0	95.5

* BIOWAGE STAGE NOT POSSIBLE; DENSITIES ORGANISM PRESENT.
 * BIOWAGE STAGE NOT POSSIBLE; DENSITIES ORGANISM PRESENT.
 * BIOWAGE STAGE NOT POSSIBLE; DENSITIES ORGANISM PRESENT.

TABLE 2-2-36

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (50 CM) AT STATION TM-421-1142, APRIL 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	12 APRIL				29 APRIL			
	CLAY, SILT, FINE SAND, DETRITUS				CLAY, SILT, FINE SAND, COARSE DETRITUS			
	NO	WT	NO	WT	NO	WT	NO	WT
12 APRIL								
WATER TEMP (C)								
WATER TEMP (C)								
DISSOLVED OXYGEN (MG/L)								
PH								
SECCHI DISC (CM)								
BIOWAGE STAGE (M)								
SUBSTRATE								
REPLICATE								
MARENZELLERIA								
MARENZELLERIA								
MARENZELLERIA GRACILIS								
MARENZELLERIA SOMMERBYI								
MARENZELLERIA CLAPAREDEIANUS								
MARENZELLERIA HOFFMEYERII								
MARENZELLERIA UDEKEMIANUS								
MARENZELLERIA SPP.								
MARENZELLERIA MULTISETOSUS								
MARENZELLERIA ELONGATA								
MARENZELLERIA FALSIATUS								
MARENZELLERIA SPP.								
MARENZELLERIA BREVICALCAP BR								
MARENZELLERIA DIODUS GR								
MARENZELLERIA FULVUS GR								
MARENZELLERIA BREVIENS								
MARENZELLERIA VIRGINICA								
MARENZELLERIA SPP.								
TOTAL ORGANISMS	21		42		84		6	
TOTAL BIOWAGE	2		0		8		0	
TOTAL WEIGHT	15.1	16.8	0.0	0.0	24.8	19.0	77.8	11.0

* BIOWAGE STAGE NOT POSSIBLE; DENSITIES ORGANISM PRESENT.

TABLE 2-2-46

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (529 SO CM) AT STATION TM-401-981, MARCH 1982.
DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	8 MARCH								21 MARCH							
	SILT, CLAY, FINE SAND, DETRITUS								SILT, CLAY, FINE SAND, DETRITUS							
	A		B		C		D		A		B		C		D	
NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	
DATE	8 MARCH															
TIME	11:00															
AIR TEMP (C)	12.0															
WATER TEMP (C)	12.0															
DISSOLVED OXYGEN (MG/L)	12.0															
SECCHI DISC (CM)	2.0															
RIVER STAGE (M)	2.0															
SUBSTRATE	SILT, CLAY, FINE SAND, DETRITUS															
REPLICATE																
NEREIDA																
CRISTATELLA MUCEDO																
LOPHOPROCTELLA CARTERI																
PECTINATELLA MAGNIFICA																
LEPTODORILLUS TEMPLETONI																
LEPTODORILLUS HOFFMEISTERI																
LEPTODORILLUS UDENKENTIANUS																
LEPTODORILLUS SPP.																
MUSCIBOLUS MULTISETOSUS																
NEPHELELLA FLONGATA																
NEPHELELLA SPP.																
OPTIDORILLUS SPP.																
PROCLADUS SPP.																
ABLARINEMYS CP, CINCTIPES																
CHIRONOMUS DECORUS GR																
CHIRONOMUS FULVUS GR																
HYALINOTENDIPES SPP.																
HEMITELELLA SPP.																
ELMIRA VIRGINICA																
AMMOCOLA SPP.																
PISIDIUM SPP.																
TOTAL ORGANISMS	154		203		130		120		98		118		62		43	
TOTAL WEIGHT	74.3		156.8		46.0		48.0		31.4		27.1		29.7		110.8	

* QUANTIFICATION NOT POSSIBLE, REMOTE ORGANISM PRESENT.
* STRAIGHT TUBIFORM WITH CAP CELL FORM CHARACTER.

TABLE 2-2-47

NUMBERS AND WEIGHTS IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (529 SO CM) AT STATION TM-401-981, APRIL 1982.
DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	12 APRIL								29 APRIL							
	FINE SAND, SILT, COARSE SAND, DETRITUS				SILT, COARSE SAND, COAL, BRANDED DETRITUS											
	A		B		C		D		A		B		C		D	
NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	NO	WT	
DATE	12 APRIL															
TIME	10:10															
AIR TEMP (C)	16.0															
WATER TEMP (C)	16.0															
DISSOLVED OXYGEN (MG/L)	11.0															
SECCHI DISC (CM)	3.0															
RIVER STAGE (M)	3.0															
SUBSTRATE	FINE SAND, SILT, COARSE SAND, DETRITUS															
REPLICATE																
NEREIDA																
CRISTATELLA MUCEDO																
LOPHOPROCTELLA CARTERI																
PECTINATELLA MAGNIFICA																
LEPTODORILLUS TEMPLETONI																
LEPTODORILLUS HOFFMEISTERI																
LEPTODORILLUS UDENKENTIANUS																
LEPTODORILLUS SPP.																
MUSCIBOLUS MULTISETOSUS																
NEPHELELLA FLONGATA																
NEPHELELLA SPP.																
OPTIDORILLUS SPP.																
PROCLADUS SPP.																
ABLARINEMYS CP, CINCTIPES																
CHIRONOMUS DECORUS GR																
CHIRONOMUS FULVUS GR																
HYALINOTENDIPES SPP.																
HEMITELELLA SPP.																
ELMIRA VIRGINICA																
AMMOCOLA SPP.																
PISIDIUM SPP.																
TOTAL ORGANISMS	154		28		48		117		163		175		166		147	
TOTAL WEIGHT	339.2		28.9		86.9		46.1		108.0		178.0		150.0		83.7	

* QUANTIFICATION NOT POSSIBLE, REMOTE ORGANISM PRESENT.
* STRAIGHT TUBIFORM WITH CAP CELL FORM CHARACTER.

TABLE 2-2-49

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (529 SQ CM) AT STATION TW-421-781, JUNE 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	10 JUNE				21 JUNE			
	CLAY, SILT, FINE SAND,				CLAY, SILT, FINE SAND,			
	OVIDIUS				OVIDIUS			
TIME	A		B		C		D	
AIR TEMP (C)	NO	WT	NO	WT	NO	WT	NO	WT
WATER TEMP (C)								
DISSOLVED OXYGEN (MG/L)								
SECCHT DISC (CM)								
RIVER STAGE (M)								
SUBSTRATE								
REPLICATE								
NEMATODA								
OPHREOTHECA GRACILIS								
CRISTATELLA MUCCOLO								
COMPOSPONELLA CARTER								
CHARYBDEA LAMNATA								
LIMNOCORILLUS HOFFMEISTER	80	73.6	49	37.8	146	84.1	5	
LIMNOCORILLUS SPP.	91	15.9	27	16.0	114	50.6	5	
AMPHIRODIA ELONGATA								
PLACODONELLA MONTIFERA								
HERBERTIA SPP.								
PROCLADUS SPP.								
COLEPTERUS SPP.								
CHIRONOMUS DECURVUS OR	28	18.7	17	8.7	44	28.8		
CHIRONOMUS SPP.								
CRYPTOCHIRONOMUS FLAVINUS	10	2.0	2	0.5	8	2.7		
CRYPTOCHIRONOMUS SPP.								
SPHAERIUM SPP.								
ELIMIA VIRGINICA								
STYLODONTOMUS SPP.								
TOTAL ORGANISMS	19		13		32		10	
TOTAL WEIGHT	80.0		53.3		176.7		0.0	

* QUANTIZATION NOT POSSIBLE, DENOTES ORGANISM PRESENT.
 * INHABITANT IDENTIFIED WITH CAPILLIFORM CHARACTER.

TABLE 2-2-50

NUMBERS AND WEIGHT IN MILLIGRAMS, NO. WT. OF BENTHIC ORGANISMS PER PONAR GRAB (529 SQ CM) AT STATION TW-421-781, JULY 1962. DASHES INDICATE SPECIES NOT PRESENT OR NO WEIGHT TAKEN.

DATE	10 JULY				26 JULY			
	SILT, FINE SAND, COARSE SAND,				SILT, FINE SAND,			
	OVIDIUS				OVIDIUS			
TIME	A		B		C		D	
AIR TEMP (C)	NO	WT	NO	WT	NO	WT	NO	WT
WATER TEMP (C)								
DISSOLVED OXYGEN (MG/L)								
SECCHT DISC (CM)								
RIVER STAGE (M)								
SUBSTRATE								
REPLICATE								
TURBELLARIA								
NEMATODA								
OPHREOTHECA GRACILIS								
CRISTATELLA MUCCOLO								
COMPOSPONELLA CARTER								
CHARYBDEA LAMNATA								
LIMNOCORILLUS HOFFMEISTER	29	13.9	29	8.5	17	3.3	20	3.1
LIMNOCORILLUS SPP.	136	18.7	39	5.1	68	5.0	20	2.4
AMPHIRODIA ELONGATA								
PLACODONELLA MONTIFERA								
HERBERTIA SPP.								
PROCLADUS SPP.								
COLEPTERUS SPP.								
CHIRONOMUS DECURVUS OR	110	71.3	39	24.5	32	24.4	21	23.4
CHIRONOMUS SPP.								
CRYPTOCHIRONOMUS FLAVINUS								
CRYPTOCHIRONOMUS SPP.								
SPHAERIUM SPP.								
ELIMIA VIRGINICA								
STYLODONTOMUS SPP.	148	9	3	142.5			1	23.6
TOTAL ORGANISMS	293		252		130		92	
TOTAL WEIGHT	285.3		199.0		48.0		76.8	

* QUANTIZATION NOT POSSIBLE, DENOTES ORGANISM PRESENT.
 * INHABITANT IDENTIFIED WITH CAPILLIFORM CHARACTER.

Table 2.1-56

Numbers and percent composition of benthic organisms collected at the five macroinvertebrate stations in 1982. Dashes indicate species not present.

	TM-AQI-1A1		TM-AQI-1A2		TM-AQI-11A1		TM-AQI-11A2		TM-AQI-VB1		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Turbellaria	11	0.12	39	0.35	114	1.02	206	1.71	278	1.67	668	1.01
Nemertinea	3	0.05	18	0.11	6	0.05	3	0.04	3	0.02	37	0.06
Nematoda	21	0.22	50	0.30	62	0.56	66	0.55	39	0.23	238	0.36
Enchytraeidae	1	0.01	22	0.13	7	0.06	-	-	1	0.01	31	0.05
Arctonais limondi	163	1.72	616	3.69	100	0.90	272	2.28	194	1.16	1345	2.04
Chaetogaster limnaii	154	1.62	18	0.11	171	1.53	136	1.13	126	0.76	605	0.92
Dero sp. (?) digitata	3	0.03	8	0.05	-	-	-	-	-	-	11	0.02
D. flabelliger	-	-	1	0.01	-	-	-	-	-	-	1	+
Neis breitscheri	2	0.02	-	-	3	0.03	1	0.01	2	0.01	8	0.01
N. communis	-	-	3	0.02	-	-	-	-	-	-	3	+
N. elinguis	1	0.01	-	-	-	-	-	-	-	-	1	+
N. parvella	1	0.01	4	0.02	-	-	2	0.02	-	-	7	0.01
N. variabilis	2	0.02	6	0.04	1	0.01	-	-	-	-	9	0.01
Piguettella michiganensis	49	0.52	7	0.04	-	-	1	0.01	-	-	57	0.09
Pristina leidyi	-	-	-	-	1	0.01	-	-	-	-	1	+
P. synclites	4	0.04	2	0.01	-	-	1	0.01	-	-	7	0.01
Slavina appendiculata	-	-	1	0.01	1	0.01	1	0.01	-	-	3	+
Specaria lowmeae	3	0.05	41	0.25	11	0.10	11	0.09	25	0.15	93	0.14
Wespa mobilis	-	-	-	-	2	0.02	-	-	1	0.01	3	+
Aulodrilus limnobius	1	0.01	15	0.09	-	-	2	0.02	3	0.02	21	0.03
A. pigueti	3	0.03	31	0.19	1	0.01	1	0.01	-	-	36	0.05
A. plurisetus	-	-	9	0.05	1	0.01	-	-	-	-	10	0.02
Branchiura sowerbyi	32	0.34	266	1.59	2	0.02	6	0.05	2	0.01	308	0.47
Hydrophilus templetoni	6	0.06	94	0.56	34	0.30	46	0.38	99	0.59	279	0.42
Limnodrilus cervix	3	0.05	2	0.01	10	0.09	-	-	-	-	17	0.03
L. clapparedianus	30	0.32	127	0.76	90	0.81	32	0.27	7	0.06	289	0.44
L. hoffmeisteri	1941	20.45	8186	49.01	5011	44.91	5612	46.62	10191	61.19	30941	46.85
L. udekemianus	84	0.88	170	1.02	275	2.46	316	2.63	239	1.42	1084	1.64
Pristodrilus multisetosus	7	0.07	1	0.01	16	0.14	11	0.09	10	0.06	45	0.07
Spiroperma nikolskyi	-	-	-	-	-	-	2	0.02	1	0.01	3	+
Tubifex tubifex	16	0.17	-	-	-	-	-	-	7	0.04	23	0.03
Unidentified Tubificidae	8	0.08	-	-	-	-	-	-	-	-	8	0.01
Megadrile	13	0.14	36	0.22	7	0.06	-	-	1	0.01	57	0.09
Manayunkia speciosa	-	-	1	0.01	2	0.02	2	0.02	-	-	5	0.01
Actinobdella inequiannulata	1	0.01	-	-	-	-	1	0.01	-	-	2	+
Helobdella elongata	-	-	26	0.16	62	0.56	19	0.16	72	0.43	179	0.27
H. fusa	2	0.02	-	-	3	0.03	2	0.02	7	0.04	14	0.02
H. triseriata	1	0.01	-	-	1	0.01	4	0.03	-	-	6	0.01
Pleurobdella montifera	-	-	-	-	-	-	-	-	1	0.01	1	+
Eprobdeidae	-	-	1	0.01	13	0.12	7	0.06	6	0.04	27	0.04
Hydracarina	-	-	1	0.01	-	-	-	-	-	-	1	+
Lirceus sp.	-	-	1	0.01	-	-	-	-	-	-	1	+
Stygobromus n. sp.*	-	-	-	-	28	0.25	3	0.02	3	0.02	34	0.05
Gammarus fasciatus	56	0.59	175	1.05	277	2.48	334	2.77	111	0.67	953	1.44
Orconectes sp.	1	0.01	-	-	2	0.02	-	-	-	-	3	+
Stenonema mediopunctatum	-	-	-	-	1	0.01	-	-	-	-	1	+
S. terminatum	-	-	-	-	1	0.01	-	-	-	-	1	+
Caenis spp.	3	0.05	-	-	1	0.01	5	0.04	-	-	11	0.02
Potananthus myope group sp.	-	-	-	-	1	0.01	-	-	-	-	1	+
P. verticis	1	0.01	1	0.01	3	0.03	-	-	-	-	5	0.01
P. walkeri	1	0.01	4	0.02	3	0.03	-	-	-	-	8	0.01
Potananthus spp.	-	-	-	-	-	-	-	-	1	0.01	1	+
Hexageia spp.	127	1.34	285	1.71	41	0.37	41	0.34	70	0.42	564	0.85
Gomphus spiniceps	-	-	3	0.02	2	0.02	3	0.02	-	-	8	0.01
Corixidae	-	-	4	0.02	1	0.01	-	-	-	-	5	0.01
Cheumatopsyche spp.	2	0.02	33	0.20	2	0.02	6	0.05	-	-	43	0.07
Hydropsyche aerata	-	-	-	-	1	0.01	-	-	-	-	1	+
H. phalerata	1	0.01	12	0.07	-	-	1	0.01	-	-	14	0.02
Hydropsyche spp.	-	-	1	0.01	-	-	-	-	-	-	1	+
Macronema sebratum	-	-	3	0.02	-	-	-	-	-	-	3	+
Symphitopsyche bifida group sp.	-	-	2	0.01	-	-	-	-	-	-	2	+
Protophila spp.	-	-	1	0.01	-	-	-	-	-	-	1	+
Hydrophila spp.	-	-	-	-	1	0.01	-	-	-	-	1	+
Limnephilidae	-	-	-	-	-	-	-	-	1	0.01	1	+
Ceraclea spp.	1	0.01	-	-	-	-	-	-	-	-	1	+
Decetis sp.	6	0.06	1	0.01	1	0.01	1	0.01	3	0.02	16	0.02
Petrophila sp.	-	-	3	0.02	-	-	-	-	-	-	3	+
Berosus spp.	-	-	4	0.02	-	-	-	-	-	-	4	0.01
Psephenus herricki	-	-	1	0.01	-	-	-	-	-	-	1	+
Dubiraphia spp.	6	0.06	19	0.11	5	0.04	3	0.02	1	0.01	34	0.05
Macronema glabratus	-	-	1	0.01	-	-	-	-	-	-	1	+
Optioservus spp.	-	-	3	0.02	2	0.02	-	-	2	0.01	7	0.01
Stenelmis bicarinata	-	-	1	0.01	-	-	-	-	-	-	1	+
Stenelmis spp.	12	0.13	9	0.05	-	-	2	0.02	2	0.01	25	0.04
Erioptera sp.	-	-	2	0.01	-	-	-	-	-	-	2	+
Pseudolimnophila sp.	-	-	1	0.01	-	-	-	-	-	-	1	+
Tipula (Yamatotipula) sp.	-	-	3	0.02	-	-	-	-	-	-	3	+
Tipula sp.	-	-	1	0.01	-	-	-	-	-	-	1	+
Psychoda sp.	-	-	-	-	-	-	1	0.01	-	-	1	+

Table 2.2-56 continued.

	TN-AQ1-1A1		TN-AQ1-1A2		TN-AQ1-11A1		TN-AQ1-11A2		TN-AQ1-9B1		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<i>Chlorobus punctipennis</i>	-	-	2	0.01	-	-	-	-	2	0.01	4	0.01
<i>Leptopus depressatipennis</i>	-	-	-	-	-	-	-	-	2	0.01	2	0.01
<i>Procladius</i> spp.	130	1.37	464	2.78	482	4.32	176	1.46	544	3.27	1796	2.72
<i>Coelocnopus scapularis</i>	1	0.01	28	0.17	14	0.13	-	-	6	0.04	49	0.07
<i>Abimegnis cf. xanctipes</i>	44	0.46	45	0.39	18	0.16	15	0.12	21	0.13	143	0.25
<i>A. mallochii</i>	1	0.01	-	-	-	-	-	-	2	0.01	3	+
<i>A. sp. philaeophagus</i>	1	0.01	-	-	-	-	1	0.01	1	0.01	2	+
<i>A. philaeophagus</i>	1	0.01	3	0.02	-	-	2	0.02	1	0.01	7	0.01
<i>Letia</i> sp.	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Notata</i> sp. A	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Parameira</i> sp.	1	0.01	1	0.01	-	-	-	-	-	-	2	+
<i>Thienemichia</i> group sp.	1	0.01	4	0.02	2	0.02	1	0.01	1	0.01	9	0.01
<i>Cardiocladius obscurus</i> ?	-	-	2	0.01	-	-	-	-	-	-	2	+
<i>Cricotopus (Cricotopus) prob. tremulus</i>	-	-	3	0.02	-	-	-	-	-	-	3	+
<i>Cricotopus/Orthocladus</i> sp.	3	0.03	20	0.12	2	0.02	1	0.01	3	0.02	29	0.04
<i>Eukiefferiella brevicornis</i> group sp.	-	-	16	0.10	1	0.01	1	0.01	-	-	18	0.03
<i>Hydrobaenus</i> sp.	12	0.13	3	0.02	-	-	9	0.07	-	-	24	0.04
<i>Mesocricotopus</i> sp.	-	-	-	-	1	0.01	-	-	-	-	1	+
<i>Nannocladus minimus</i> n. sp.	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Orthocladus (Eucricotopus) rivicola</i>	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>O. (Eucricotopus) sp.</i>	-	-	4	0.02	-	-	-	-	-	-	4	0.01
<i>O. (Orthocladus) obscuratus</i>	-	-	2	0.01	-	-	-	-	-	-	2	+
<i>O. (Orthocladus) oliveri</i>	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Scitia</i> sp.	-	-	2	0.01	-	-	-	-	-	-	2	+
<i>Tyteris discoloripes</i> group sp.	-	-	1	0.01	-	-	2	0.02	-	-	3	+
<i>Chironomus decorus</i> group sp.	3947	41.58	4728	28.30	3155	28.28	3056	25.39	3216	19.31	18102	27.41
<i>C. riparius</i> group sp.	-	-	2	0.01	-	-	-	-	-	-	2	+
<i>Cladocera amachaeris</i>	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Cryptochironomus blarina</i>	203	2.14	22	0.13	43	0.39	114	0.95	79	0.47	461	0.70
<i>C. fulvus</i> group sp.	100	1.05	241	1.44	404	3.62	406	3.37	511	3.07	1662	2.52
<i>Cryptotendipes</i> sp.	1	0.01	10	0.06	1	0.01	1	0.01	-	-	13	0.02
<i>Demitryptochironomus cf. sumentis</i>	31	0.33	-	-	12	0.11	35	0.29	10	0.06	88	0.13
<i>Microtendipes neomodestus</i>	5	0.05	7	0.04	6	0.05	3	0.02	3	0.02	24	0.04
<i>M. nervosus</i> Type 1	-	-	-	-	-	-	1	0.01	-	-	1	+
<i>Diplotendipes</i> sp.	1	0.01	8	0.05	2	0.02	2	0.02	9	0.05	22	0.03
<i>Harnischia curtisvellaie</i>	3	0.03	1	0.01	2	0.02	5	0.04	3	0.02	15	0.02
<i>Microchironomus</i> sp.	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Microtendipes</i> sp.	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Parachironomus pectinatellae</i>	-	-	-	-	-	-	1	0.01	-	-	1	+
<i>Paratendipes</i> sp.	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Phaenopsectra nr. obediens</i>	14	0.15	93	0.56	22	0.20	6	0.07	12	0.07	149	0.23
<i>Phaenopsectra</i> sp. A	-	-	1	0.01	-	-	-	-	1	0.01	2	+
<i>Polypeilus convictum</i>	1	0.01	1	0.01	-	-	1	0.01	-	-	3	+
<i>P. halleri</i> group sp.	26	0.27	85	0.51	12	0.11	23	0.19	28	0.17	174	0.26
<i>P. illinoense</i>	-	-	1	0.01	1	0.01	-	-	1	0.01	3	+
<i>P. laetum</i>	6	0.06	1	0.01	-	-	-	-	-	-	7	0.01
<i>P. scalenum</i> group sp.	1299	13.69	202	1.21	13	0.12	9	0.07	3	0.02	1526	2.31
<i>Stenochironomus</i> sp.	5	0.05	1	0.01	-	-	1	0.01	-	-	7	0.01
<i>Tribelos lucidus</i>	-	-	1	0.01	-	-	-	-	-	-	1	+
<i>Cladotanytarsus</i> sp.	-	-	-	-	-	-	-	-	4	0.02	4	0.01
<i>Leotanytarsus</i> sp.	1	0.01	7	0.04	3	0.03	3	0.02	1	0.01	13	0.02
<i>Tanytarsus junceus</i> ?	-	-	-	-	1	0.01	-	-	-	-	1	+
<i>T. glabrescens</i> group ? sp. A	-	-	1	0.01	-	-	-	-	3	0.02	4	0.01
<i>T. guerini</i> group sp.	64	0.68	14	0.08	5	0.04	15	0.12	6	0.04	124	0.19
<i>Tanytarsus</i> group A	-	-	1	0.01	1	0.01	-	-	3	0.02	5	0.01
<i>Tanytarsus</i> sp.	1	0.01	-	-	2	0.02	-	-	-	-	3	+
<i>Talponia</i> group sp.	1	0.01	9	0.05	3	0.03	-	-	6	0.04	19	0.03
Sciaridae	-	-	7	0.01	-	-	1	0.01	-	-	3	+
Chrysops sp.	-	-	-	-	-	-	1	0.01	-	-	1	+
Empididae	-	-	3	0.02	-	-	-	-	-	-	3	+
Hemerodromia sp.	1	0.01	1	0.01	-	-	-	-	-	-	2	+
Cyclorhapha	-	-	1	0.01	-	-	-	-	-	-	1	+
Delichopodidae	-	-	1	0.01	-	-	-	-	-	-	1	+
Physella sp.	6	0.06	-	-	5	0.04	1	0.01	-	-	12	0.02
Lymnaea sp.	-	-	1	0.01	1	0.01	-	-	-	-	2	+
Cyraulius parvus	2	0.02	-	-	-	-	-	-	1	0.01	3	+
Ferrisia spp.	50	0.53	27	0.16	-	-	-	-	4	0.02	81	0.12
<i>Elinia virginica</i>	53	0.56	10	0.06	105	0.94	160	1.33	116	0.70	444	0.67
<i>Valva tricarinata</i>	-	-	-	-	2	0.02	3	0.02	5	0.03	10	0.02
<i>Amicola</i> spp.	2	0.02	-	-	9	0.08	10	0.08	12	0.07	33	0.05
Viviparidae	-	-	-	-	2	0.02	-	-	-	-	2	+
<i>Campeloma de lae</i>	-	-	-	-	1	0.01	-	-	1	0.01	2	+
<i>Campeloma</i> sp.	-	-	-	-	4	0.04	10	0.08	16	0.10	30	0.05
<i>Lioplax subcarinata</i>	-	-	-	-	10	0.09	6	0.05	9	0.05	25	0.04
Pelecypoda	-	-	-	-	-	-	-	-	1	0.01	1	+
<i>Anodonta imbecillus</i>	-	-	-	-	1	0.01	-	-	-	-	1	+
<i>Pisidium</i> spp.	554	5.84	149	0.89	294	2.63	485	5.69	471	2.83	2153	3.26
<i>Sphaerium</i> s.p.	109	1.15	47	0.28	133	1.19	104	0.86	26	0.16	419	0.63
TOTAL	9492		16704		11158		12038		16656		66046	

* New species (n. spp.); represents possibly three new undescribed species.

+ Less than 0.0051.

Table 2.2-57

Density (number/m²) of the dominant taxa (> 2% of the total organisms) at the macroinvertebrate stations, 6 January through 16 December 1982. No samples taken in February due to ice. Dashes indicate species not present.

	Jan 6	Mar 8	Mar 31	Apr 12	Apr 29	May 10	May 24	Jun 10	Jun 21	Jul 12	Jul 26	Aug 9	Aug 23	Sep 9	Sep 20	Oct 4	Oct 21	Nov 1	Nov 15	Dec 2	Dec 16
<u>Arctocornis lomondi</u>																					
TM-AQ1-1A1	-	-	-	-	-	-	9	-	-	-	-	-	-	-	5	28	28	43	387	9	255
TM-AQ1-1A2	5	-	-	-	-	-	-	-	-	-	-	-	9	-	47	28	375	118	387	591	1399
TM-AQ1-11A1	5	-	-	-	5	9	52	-	-	-	-	-	-	-	-	66	33	5	28	80	189
TM-AQ1-11A2	5	-	-	-	-	5	567	-	-	-	-	-	-	-	9	5	9	38	14	265	364
TM-AQ1-9B1	5	-	-	-	-	47	33	-	-	-	-	-	47	-	43	9	208	52	255	24	186
<u>Limnodrilus hoffmeisleri</u>																					
TM-AQ1-1A1	270	47	38	73	47	161	272	288	161	269	345	449	524	241	421	1276	832	1276	1101	317	855
TM-AQ1-1A2	2585	279	1091	269	917	921	1110	530	1583	1186	1030	4475	4593	600	1517	1469	2155	983	7721	1449	2036
TM-AQ1-11A1	813	109	449	558	439	676	756	2556	1635	3341	2471	7824	1205	765	959	884	1040	836	664	841	855
TM-AQ1-11A2	822	317	558	222	619	789	2150	1077	1323	2202	1625	2008	1715	624	1120	1460	1829	1134	1710	1422	1791
TM-AQ1-9B1	1658	2963	1219	988	2315	3548	3459	2414	3322	2046	1191	3856	4059	912	2698	1663	2254	1465	2320	1611	2192
<u>Procladius spp.</u>																					
TM-AQ1-1A1	33	-	-	-	-	5	14	-	-	-	66	184	260	-	24	5	5	19	-	-	-
TM-AQ1-1A2	66	-	38	5	24	5	38	-	-	24	132	444	156	203	146	61	85	128	5	293	340
TM-AQ1-11A1	142	5	10	10	47	76	80	-	-	-	-	10	-	-	76	24	104	85	33	109	1446
TM-AQ1-11A2	57	-	-	-	19	5	71	-	-	-	9	-	24	14	14	14	76	184	19	128	156
TM-AQ1-9B1	529	14	66	61	132	47	5	-	-	-	66	19	19	-	-	99	104	265	902	95	109
<u>Chironomus decorus group sp.</u>																					
TM-AQ1-1A1	76	19	43	109	71	66	4224	723	61	-	813	146	605	208	92	4404	2112	2112	917	302	713
TM-AQ1-1A2	628	71	425	128	208	156	8132	680	61	1181	1611	1767	1347	118	723	302	1087	992	2372	128	222
TM-AQ1-11A1	104	24	14	14	76	-	7130	1021	255	14	28	14	28	9	369	643	1706	657	784	1498	491
TM-AQ1-11A2	128	5	33	9	9	5	8831	387	151	47	33	5	43	5	28	28	213	789	888	1833	964
TM-AQ1-9B1	57	113	28	116	113	14	9743	421	250	1076	66	28	33	5	236	255	709	1082	784	173	9
<u>Cryptochironomus fulvus group sp.</u>																					
TM-AQ1-1A1	-	-	-	-	5	90	19	-	5	19	28	99	71	-	9	9	38	-	14	28	38
TM-AQ1-1A2	24	5	19	-	90	14	-	-	14	43	80	47	9	43	99	80	61	260	95	156	
TM-AQ1-11A1	57	-	-	5	128	24	175	90	19	118	80	95	137	38	52	52	720	232	165	113	161
TM-AQ1-11A2	61	-	9	-	104	28	90	66	9	113	90	61	132	61	19	76	203	132	255	232	170
TM-AQ1-9B1	203	66	19	57	76	38	61	104	9	312	47	137	194	61	38	175	118	241	345	52	61
<u>Polydora scalacum group sp.</u>																					
TM-AQ1-1A1	-	-	9	38	213	3185	732	663	213	307	662	71	38	-	9	-	14	-	-	5	-
TM-AQ1-1A2	-	-	5	-	71	184	-	9	146	-	529	9	-	-	-	-	-	-	-	-	-
TM-AQ1-11A1	-	-	-	-	-	9	-	5	-	9	33	5	-	-	-	-	-	-	-	-	-
TM-AQ1-11A2	-	-	-	-	-	-	-	9	-	5	-	14	14	-	-	-	-	-	-	-	-
TM-AQ1-9B1	-	-	-	-	-	-	9	5	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Pisidium spp.</u>																					
TM-AQ1-1A1	5	47	317	209	539	71	19	298	33	28	109	52	24	19	38	142	28	76	24	19	24
TM-AQ1-1A2	-	19	33	-	14	156	33	24	19	19	19	137	38	5	28	19	24	24	21	9	14
TM-AQ1-11A1	24	5	9	28	9	14	14	118	19	142	137	170	19	71	109	33	161	14	95	43	156
TM-AQ1-11A2	66	5	5	-	-	-	57	85	24	312	118	397	57	65	321	99	350	411	189	293	364
TM-AQ1-9B1	52	-	9	217	47	28	57	9	9	52	66	222	76	52	151	118	218	151	345	208	236

Table 2.2-58

Biomass (mg/m³) of selected taxa at the macroinvertebrate stations, 6 January through 16 December 1987. No samples taken in February due to ice. Dashes indicate species not present. * Indicates organism present but weight not determined.

	Jan 6	Mar 8	Mar 31	Apr 12	Apr 29	May 10	May 25	Jun 10	Jun 23	Jul 12	Jul 25	Aug 9	Aug 23	Sep 9	Sep 20	Oct 1	Oct 21	Nov 1	Nov 13	Dec 2	Dec 14
Limnodrilus hoffmeisteri																					
TM-A01-1A1	54.8	+	+	+	+	21.7	31.7	43.5	26.5	84.5	82.9	206.2	232.3	65.2	136.2	167.8	118.2	206.2	173.9	26.8	208.9
TM-A01-1A2	1236.9	28.8	255.2	62.4	313.8	321.8	492.4	96.4	268.4	273.5	137.0	36.5	420.5	56.7	182.1	126.8	127.6	1050.6	233.0	286.0	
TM-A01-11A1	399.8	+	43.0	346.9	227.8	353.0	535.6	341.7	239.1	369.2	560.5	332.2	240.6	185.1	180.1	169.3	153.6	178.6	155.5	163.7	233.5
TM-A01-11A2	257.6	54.6	259.6	64.7	251.0	791.1	1007.6	310.0	228.7	295.6	267.0	278.5	291.6	166.8	165.4	279.2	291.6	195.6	298.5	278.0	327.8
TM-A01-9B1	792.1	1217.9	442.7	600.8	1585.5	1769.5	888.5	1078.4	679.1	227.5	175.8	387.5	630.9	225.9	542.3	694.8	466.9	395.1	664.5	665.1	1019.9
Hexacenia spp.																					
TM-A01-1A1	-	-	-	-	-	116.2	-	-	-	-	10.0	62.5	287.0	276.2	965.4	1508.7	206.5	365.7	206.1	65.7	208.7
TM-A01-1A2	387.5	48.7	33.5	-	-	-	1.9	-	-	-	3.3	132.0	381.3	491.9	9.1	3810.7	133.4	630.6	25.3	1888.1	6231.2
TM-A01-11A1	60.5	-	38.4	106.9	-	-	17.0	1396.7	1096.1	410.6	248.5	27.9	-	12.3	-	-	54.3	-	-	25.5	138.7
TM-A01-11A2	50.6	95.0	-	48.2	-	-	55.8	361.1	222.1	166.5	2.4	105.8	74.2	93.6	235.5	143.7	127.0	106.3	-	343.5	18.0
TM-A01-9B1	657.7	166.1	276.4	335.5	498.5	570.8	186.2	135.1	406.5	-	5.3	-	60.0	90.7	551.9	287.8	221.6	215.0	25.5	165.5	130.6
Chironomus decoretus group sp.																					
TM-A01-1A1	54.8	5.7	18.0	93.6	50.1	60.5	1427.7	522.1	21.3	-	249.0	3.8	181.4	116.7	159.7	1036.7	778.8	1412.3	607.8	286.0	670.5
TM-A01-1A2	578.3	54.8	241.5	80.8	208.9	166.3	2969.5	334.1	24.5	663.9	798.5	596.2	525.5	79.9	83.6	53.6	467.2	576.0	1016.4	111.5	280.2
TM-A01-11A1	66.3	+	+	+	62.3	+	2075.2	689.4	139.1	+	+	+	+	21.7	105.0	521.2	308.5	507.0	1386.0	546.2	
TM-A01-11A2	116.7	+	+	+	+	+	2475.9	258.0	78.9	21.7	3.8	+	1.9	+	4.7	+	39.2	126.7	534.4	1797.9	1135.4
TM-A01-9B1	48.2	178.1	+	83.6	115.3	+	2785.4	266.5	101.6	678.5	7.8	1.4	3.8	+	47.7	46.8	419.6	786.6	592.5	93.1	+
Elinia vladimica																					
TM-A01-1A1	-	232.2	6327.2	1068.8	-	1034.8	294.8	-	263.2	445.4	1186.1	954.0	637.4	32.2	1230.9	336.9	188.1	418.0	510.8	616.3	-
TM-A01-1A2	-	-	-	182.4	-	-	-	-	-	-	-	-	-	-	282.1	391.2	400.2	-	385.6	298.1	1325.4
TM-A01-11A1	603.9	430.0	748.6	544.8	703.6	1490.7	2260.6	1973.2	1066.6	1920.2	2656.5	1762.4	393.1	2973.6	3542.8	812.2	3981.8	-	-	-	308.4
TM-A01-11A2	8699.2	-	328.4	-	367.6	5106.8	1263.1	2022.8	1148.6	4148.2	4260.5	2195.7	2010.0	530.1	379.4	1712.3	3861.0	446.4	-	22.7	2023.2
TM-A01-9B1	445.6	-	177.4	1336.2	-	335.0	-	-	943.4	1298.8	5222.0	2462.5	3868.1	1648.6	2584.2	1996.0	706.5	3034.9	2336.4	405.5	298.6

Table 2.2-59

Results of three factor analysis of variance tests on populations of Limnodrilus hoffmeisteri in 1982.

Sources of Variation	df	SS	MS	F
Total	419	2160837.00		
Date	20	328573.26	16428.66	9.02*
Station	4	473445.50	118361.37	64.95*
Replicate	3	14532.60	4844.20	2.66*
Date X Station	80	760249.60	9503.12	5.21*
Date X Replicate	60	128586.12	2143.10	1.18
Station X Replicate	12	18092.56	1507.71	0.83
Residual	240	437359.00	1822.33	

* Significant at $P \leq 0.05$.

Table 2.2-60

Results of the Student-Newman-Keuls multirange tests ($P < 0.05$) on residual mean densities (n/ponar grab) of Limnodrilus hoffmeisteri with corresponding actual mean densities (n/ponar grab) for the macroinvertebrate stations, 1982. Residual mean densities underlined were not significantly different.

Station*	IA1	IIA1	IIA2	IA2	9B1
Residual density	-50.6	-14.0	-6.9	23.7	47.7
Actual density	23	60	67	97	121

* Prefix TM-AQI- deleted from table.

Table 2.2-61

Diversity (H') values at the macroinvertebrate stations sampled in 1982.

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	ANNUAL
TM-AQ1-1A1	2.93	NO	2.80	1.91	1.89	2.75	3.00	3.10	2.74	1.68	2.93	2.62	2.93
TM-AQ1-1A2	1.83		3.63	3.13	1.47	1.88	2.10	1.78	2.52	2.50	1.75	2.56	2.55
TM-AQ1-11A1	2.60	SAMPLES	2.48	2.74	1.60	2.30	1.27	1.72	2.56	2.65	2.43	2.64	2.67
TM-AQ1-11A2	2.71		2.10	1.76	1.61	2.22	2.04	1.98	2.53	2.50	2.55	2.59	2.65
TM-AQ1-9B1	1.98	TAKEN	0.95	1.86	1.55	0.98	1.89	1.38	1.90	2.31	2.78	1.99	2.13

Table 2.2-62

Index of percent similarity for species composition (PSc) between the macroinvertebrate stations sampled in 1982. Station prefix TM-AQ1- deleted from table.

	9E1	11A2	11A1	1A2
1A1	51	63	62	61
1A2	79	86	85	
11A1	82	91		
11A2	83			

Table 2.3-1

Summary of macroinvertebrate data collected each year, 1974 through 1982.

	YEAR								
	1974	1975	1976	1977	1978	1979	1980	1981	1982
No. of taxa collected	78	71	112	131	142	141	152	150	165
No. of organisms collected	35803	90213	90567	172925	151467	174699	152471	80752	66048
No. of organisms/m ²	2417	6091	6115	8602	7535	8256	7206	4328	2973
PERCENT COMPOSITION									
<i>Limnodrilus hoffmeisteri</i>	70.35	79.98	72.34	85.71	78.23	69.20	72.72	52.11	46.85
<i>Chironomus decorus</i> group sp.	16.34	10.63	10.03	4.49	6.17	14.73	6.92	20.41	27.41
DENSITY (n/m ²)									
<i>Limnodrilus hoffmeisteri</i>	2291	4456	3816	7184	5894	5713	5240	2099	1393
<i>Chironomus decorus</i> group sp.	416	546	431	386	465	1216	499	822	815
BIGMASS (mg/m ²)									
<i>Limnodrilus hoffmeisteri</i>	779.4	1088.6	915.6	1415.4	1023.1	1126.8	1193.7	512.2	329.4
<i>Chironomus decorus</i> group sp.	127.4	257.1	260.4	127.9	139.4	391.5	117.4	435.7	358.8
Diversity Index (H')	1.55	1.26	1.92	1.28	1.62	1.89	1.95	2.70	2.70

Table 2.3-2

Analysis of variance results on residual densities of Limnodrilus hoffmeisteri and total number of organisms for each year, 1975 through 1982.

Factors	df	<u>Limnodrilus hoffmeisteri</u>	<u>Total number of organisms</u>
		F _{cal}	F _{cal}
<u>Unit 1 Operation</u>			
1975			
Sample date	18	7.75*	13.96*
Station	4	119.14*	115.45*
Sample date X Station	72	2.99*	3.62*
Error	285		
1976			
Sample date	19	5.81*	12.50*
Station	4	23.33*	9.86*
Sample date X Station	76	3.32*	3.75*
Error	300		
1977			
Sample date	18	23.23*	29.89*
Station	4	87.76*	80.52*
Sample date X Station	72	5.08*	5.25*
Error	285		
<u>Unit 1 Operation</u>			
1978			
Sample date	18	7.01*	13.08*
Station	4	117.54*	112.29*
Sample date X Station	72	6.19*	6.84*
Error	285		
<u>Unit 1 and Unit 2 Shutdown</u>			
1979			
Sample date	19	17.18*	21.41*
Station	4	54.99*	51.29*
Sample date X Station	76	6.34*	6.69*
Error	300		
1980			
Sample date	19	16.29*	9.70*
Station	4	33.45*	21.92*
Sample date X Station	76	5.37*	3.97*
Error	300		
1981			
Sample date	18	4.52*	19.20*
Station	4	45.02*	29.35*
Sample date X Station	72	4.15*	5.06*
Error	285		
1982			
Sample date	20	9.02*	29.15*
Station	4	64.95*	19.76*
Sample date X Station	80	2.66*	3.88*
Error	315		

* indicates that $P < 0.05$.

Table 2.3-3

Results of the Student-Newman-Keuls multirange tests ($P \leq .05$) on populations of *Limnodrilus hoffmeisteri* (mean residual density; n/ponar grab) for each year, 1975 through 1982. Means underlined were not significantly different. Stations are ranked from lowest to highest mean residual density.

Unit I Operation					
1975					
Station*	1A1	1A2	9B1	11A2	11A1
Residual density	-202.5	-88.4	-51.3	86.5	255.8
1976					
Station	1A1	1A2	9B1	11A2	11A1
Residual density	-103.9	-34.3	17.2	53.6	67.3
1977					
Station	1A1	1A2	9B1	11A2	11A1
Residual density	-331.9	-63.5	87.5	110.6	197.2
Unit I and Unit II Operation					
1978					
Station	1A1	1A2	11A2	9B1	11A1
Residual density	-219.3	-112.6	-69.2	171.7	229.9
Unit I and Unit II Shutdown					
1979					
Station	1A1	11A2	11A1	1A2	9B1
Residual density	-184.6	-72.3	-1.7	56.7	201.9
1980					
Station	1A1	11A2	11A1	9B1	1A2
Residual density	-176.9	-7.8	7.6	53.9	123.3
1981					
Station	1A1	11A2	1A2	11A1	9B1
Residual density	-86.9	-11.2	20.0	24.6	53.6
1982					
Station	1A1	11A1	11A2	1A2	9B1
Residual density	-50.6	-14.0	-6.9	23.8	47.7

* Prefix TM-AQI- deleted from table.

Table 2.3-4

Ranking of mean actual densities (n/ponar grab) of *Limnodrilus hoffmeisteri* for each year, 1975 through 1982. Stations are ranked from lowest to highest mean actual density.

Unit I Operation					
1975					
Station*	1A1	1A2	9B1	11A2	11A1
Actual density	37	149	184	326	482
1976					
Station	1A1	1A2	9B1	11A2	11A1
Actual density	110	168	212	255	277
1977					
Station	1A1	1A2	9B1	11A2	11A1
Actual density	48	316	467	492	577
Unit I and Unit II Operation					
1978					
Station	1A1	1A2	11A2	9B1	11A1
Actual density	90	183	234	458	517
Unit I and Unit II Shutdown					
1979					
Station	1A1	11A2	11A1	1A2	9B1
Actual density	117	229	304	358	503
1980					
Station	1A1	11A2	11A1	9B1	1A2
Actual density	98	268	290	330	400
1981					
Station	1A1	11A2	1A2	11A1	9B1
Actual density	26	102	126	133	167
1982					
Station	1A1	11A1	11A2	1A2	9B1
Actual density	23	60	67	97	121

* Prefix TM-AQI- deleted from table.

Table 2.3-5

Results of analysis of covariance tests for slopes of Limnodrilus hoffmeisteri and total number of organisms, 1975 through 1982. The independent variable was Station 1A2.*

<u>Limnodrilus hoffmeisteri</u>					
Dependent Variable - Station 11A1					
Source of Variance	df	SS	MS	F _{cal}	Probability
Adjusted year means	7	69527104.0	9932443.0	13.08	<0.0000
Zero slope	1	58407888.0	58407888.0	76.90	<0.0000
Error	149	113176140.0	759571.4		
Equality of slopes	7	23743248.0	3391892.0	5.39	<0.0000
Error	142	89432896.0	629809.1		
Dependent Variable - Station 11A2					
Source of Variance	df	SS	MS	F _{cal}	Probability
Adjusted year means	7	27788976.0	3969853.0	6.79	<0.0000
Zero slope	1	34941360.0	34941360.0	59.79	<0.0000
Error	149	87071472.0	584372.2		
Equality of slopes	7	11670144.0	1667163.0	3.14	0.0041
Error	142	75401328.0	530995.2		
Dependent Variable - Station 9B1					
Source of Variance	df	SS	MS	F _{cal}	Probability
Adjusted year means	7	27487872.0	3926838.0	5.72	<0.0000
Zero slope	1	71602096.0	71602096.0	104.33	<0.0000
Error	149	102257800.0	686294.0		
Equality of slopes	7	18345664.0	2620809.0	4.44	0.0002
Error	142	83912144.0	590930.6		
Total Number of Organisms					
Dependent Variable - Station 11A1					
Source of Variance	df	SS	MS	F _{cal}	Probability
Adjusted year means	7	76010192.0	10858598.0	10.06	<0.0000
Zero slope	1	92863536.0	92863536.0	86.07	<0.0000
Error	149	160753450.0	1078882.0		
Equality of slopes	7	33970528.0	552932.0	6.47	<0.0000
Error	142	121882920.0	858330.4		
Dependent Variable - Station 11A2					
Source of Variance	df	SS	MS	F _{cal}	Probability
Adjusted year means	7	26722704.0	3817529.0	4.89	0.0001
Zero slope	1	41144592.0	41144592.0	50.50	<0.0000
Error	149	121386320.0	814673.2		
Equality of slopes	7	11727280.0	1675325.0	2.17	0.0404
Error	142	109659040.0	772246.8		
Dependent Variable - Station 9B1					
Source of Variance	df	SS	MS	F _{cal}	Probability
Adjusted year means	7	36174368.0	5167766.0	4.67	0.0001
Zero slope	1	109008190.0	109008190.0	98.60	<0.0000
Error	149	164726200.0	1103545.0		
Equality of slopes	7	29598160.0	4228308.0	4.44	0.0002
Error	142	135128040.0	951605.9		

* Prefix TM-AQ1- deleted from table.

Table 2.3-6

Ranked slopes for Limnodrilus hoffmeisteri and total number of organisms, 1975 through 1982. Slopes are ranked from smallest to largest. TM-AQ1-deleted from table.

<u>Limnodrilus hoffmeisteri</u>								
Year	1981	1982	1979	1980	1976*	1978*	1975*	1977*
Stations IA2 - IIA1 slopes	-0.1772	-0.0053	0.3615	0.4987	0.8387	0.8630	1.0556	1.425
Year	1981	1982	1978*	1979	1975*	1980	1976*	1977*
Stations IA2 - IIA2 slopes	0.0513	0.1586	0.2225	0.3150	0.3344	0.4500	0.9726	1.0238
Year	1982	1980	1981	1978*	1975*	1976*	1979	1977*
Stations IA2 - 9B1 slopes	0.1858	0.2723	0.2942	0.4213	0.4986	0.6501	0.8817	1.2631
Total Number of Organisms								
Year	1982	1980	1979	1981	1976*	1978*	1975*	1977*
Stations IA2 - IIA1 slopes	0.2899	0.3176	0.4106	0.7017	0.9696	1.0453	1.2984	1.3676
Year	1978*	1980	1979	1981	1975*	1982	1977*	1976*
Stations IA2 - IIA2 slopes	0.2444	0.2659	0.3136	0.4337	0.4491	0.5561	0.7906	0.9752
Year	1980	1978*	1982	1981	1979	1976*	1975*	1977*
Stations IA2 - 9B1 slopes	0.1630	0.5601	0.6096	0.7607	0.7907	0.8837	0.9757	1.2007

* Year of TMINS operation.

Table 2.3-7

Results of analysis of covariance for slopes of grouped data of *Limnodrilus hoffmeisteri* and total number of organisms. Data were grouped by years of TMINS operation (1975 through 1978) and shutdown (1979 through 1982). The independent variable was Station TM-AQ1-1A2; dependent variable was Station TM-AQ1-11A1.

<i>Limnodrilus hoffmeisteri</i>					
Source of Variation	df	SS	MS	F _{cal}	Probability
Adjusted year means (1975 - 1978)	3	11905728.0	3968576.0	4.10	0.0095
Zero slope	1	62478512.0	62478512.0	64.58	<0.0000
Error	70	70627696.0	967502.0		
Equality of slopes (1975 - 1978)	3	3173378.0	1057792.0	1.10	0.3560
Error	70	67454320.0	963633.1		
Adjusted year means (1979 - 1982)	3	2995456.0	998485.0	3.21	0.0279
Zero slope	1	15115472.0	15115472.0	48.53	<0.0000
Error	75	23362352.0	311498.0		
Equality of slopes (1979 - 1982)	3	1383776.0	461258.6	1.51	0.2190
Error	72	21978576.0	305258.0		
Adjusted year means (1975 - 1978 vs. 1979 - 1982)	1	55833360.0	55833360.0	68.21	<0.0000
Zero slope	1	76436944.0	76436944.0	93.39	<0.0000
Error	155	126869550.0	818513.2		
Equality of slopes (1975 - 1978 vs. 1979 - 1982)	1	17978656.0	17978656.0	25.43	<0.0000
Error	154	108890890.0	707083.7		
Total Number of Organisms					
Source of Variation	df	SS	MS	F _{cal}	Probability
Adjusted year means (1975 - 1978)	3	17924496.0	5974832.0	5.59	0.0016
Zero slope	1	105783630.0	105783630.0	99.05	<0.0000
Error	70	77963488.0	1067922.0		
Equality of slopes (1975 - 1978)	3	1920784.0	640261.3	0.59	0.6240
Error	70	76042704.0	1086324.0		
Adjusted year means (1979 - 1982)	3	6027952.0	2009317.0	3.24	0.0268
Zero slope	1	23330960.0	23330960.0	37.60	<0.0000
Error	75	46538912.0	620518.8		
Equality of slopes (1979 - 1982)	3	698688.0	232896.0	0.37	0.7779
Error	72	45840224.0	636669.8		
Adjusted year means (1975 - 1978 vs. 1979 - 1982)	1	55080976.0	55080976.0	46.99	<0.0000
Zero slope	1	114162410.0	114162410.0	97.39	<0.0000
Error	155	181708040.0	1172309.0		
Equality of slopes (1975 - 1978 vs. 1979 - 1982)	1	33204368.0	33204368.0	34.43	<0.0000
Error	154	148503680.0	964309.6		

Table 2.3-8

Results of the Student-Newman-Keuls multirange tests ($P \leq 0.05$) on total number of organisms (mean residual densities; n/ponar grab) for each year, 1975 through 1982. Means underlined were not significantly different. Stations were ranked from lowest to highest mean residual density.

Unit I Operation						
1975						
Station*	1A1	1A2	9B1	11A2	11A1	
Residual density	-240.5	-94.7	-35.3	99.6	270.8	
1976						
Station	1A1	1A2	9B1	11A2	11A1	
Residual density	-73.8	-28.1	24.7	32.0	47.2	
1977						
Station	1A1	1A2	11A2	9B1	11A1	
Residual density	-357.1	-53.1	90.9	92.1	207.1	
Unit I and Unit II Operation						
1978						
Station	1A1	1A2	11A2	9B1	11A1	
Residual density	-228.4	-111.6	-107.1	201.0	249.1	
Unit I and Unit II Shutdown						
1979						
Station	1A1	11A2	11A1	1A2	9B1	
Residual density	-204.9	-111.3	18.6	77.1	320.3	
1980						
Station	1A1	11A2	11A1	9B1	1A2	
Residual density	-165.7	-53.1	-8.4	44.9	182.3	
1981						
Station	1A1	11A2	1A2	11A1	9B1	
Residual density	-122.2	-6.0	19.0	46.3	53.0	
1982						
Station	1A1	11A1	11A2	9B1	1A2	
Residual density	-44.3	-24.4	-13.9	41.0	41.6	

* Prefix TM-A07- Deleted from table.

Table 2.3-9

Ranking of mean actual densities (n/ponar grab) of total number of organisms for each year, 1975 through 1982. Stations were ranked from lowest to highest mean actual density.

Unit I Operation						
1975						
Station*	1A1	1A2	9B1	11A2	11A1	
Actual density	39	169	226	348	458	
1976						
Station	1A1	1A2	9B1	11A2	11A1	
Actual density	206	246	293	309	322	
1977						
Station	1A1	1A2	11A2	9B1	11A1	
Actual density	96	430	544	544	662	
Unit I and Unit II Operation						
1978						
Station	1A1	1A2	11A2	9B1	11A1	
Actual density	161	272	277	570	613	
Unit I and Unit II Shutdown						
1979						
Station	1A1	11A2	11A1	1A2	9B1	
Actual density	231	325	457	513	657	
1980						
Station	1A1	11A2	11A1	9B1	1A2	
Actual density	223	335	385	434	529	
1981						
Station	1A1	11A2	1A2	11A1	9B1	
Actual density	103	209	234	244	268	
1982						
Station	1A1	11A1	11A2	9B1	1A2	
Actual density	113	132	143	198	199	

* Prefix TM-AQ1- deleted from table.

Table 2.3-10

Ranking of yearly diversity (H') values for the macroinvertebrate stations, 1975 through 1982. H' values are ranked from highest to lowest.

Unit I Operat a					
1975					
Station*	1A1	1A2	9B1	11A2	11A1
Diversity	2.69	1.43	1.25	1.15	0.98
1976					
Station	1A1	1A2	9B1	11A2	11A1
Diversity	3.06	1.87	1.60	1.32	1.12
1977					
Station	1A1	1A2	9B1	11A1	11A2
Diversity	2.93	1.59	1.09	0.96	0.79
Unit I and Unit II Operation					
1978					
Station	1A1	1A2	9B1	11A2	11A1
Diversity	2.80	2.19	1.24	1.21	1.20
Unit I and Unit II Shutdown					
1979					
Station	1A1	11A2	11A1	1A2	9B1
Diversity	2.68	1.90	1.82	1.79	1.45
1980					
Station	1A1	9B1	11A1	1A2	11A2
Diversity	3.14	1.78	1.67	1.56	1.46
1981					
Station	1A1	11A1	11A2	1A2	9B1
Diversity	3.75	2.55	2.52	2.24	2.19
1982					
Station	1A1	11A1	11A2	1A2	9B1
Diversity	2.93	2.67	2.65	2.55	2.13

* Prefix TM-1QI- deleted from table.

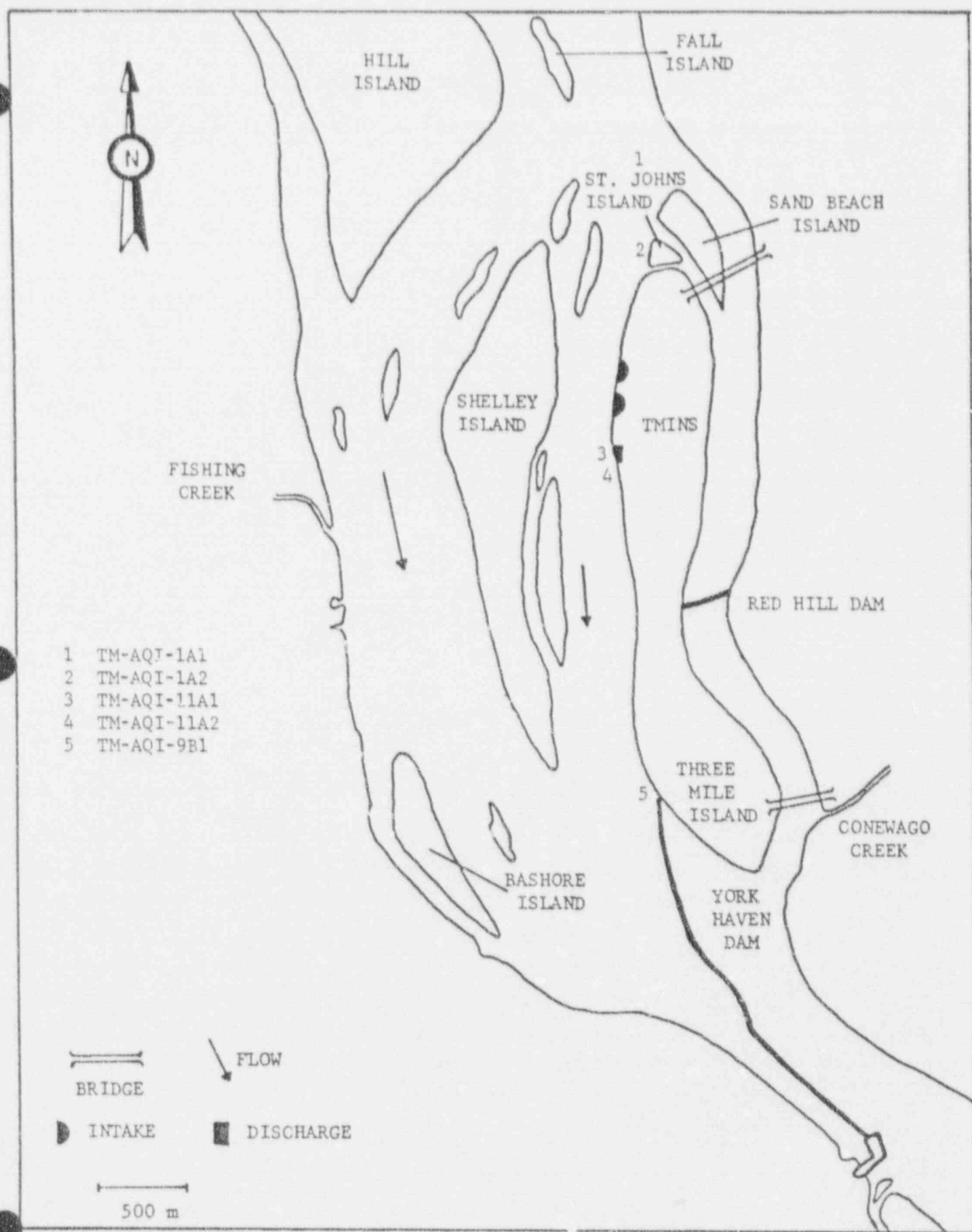


Figure 2.1-1. Location of benthic macroinvertebrate stations near TMINS.

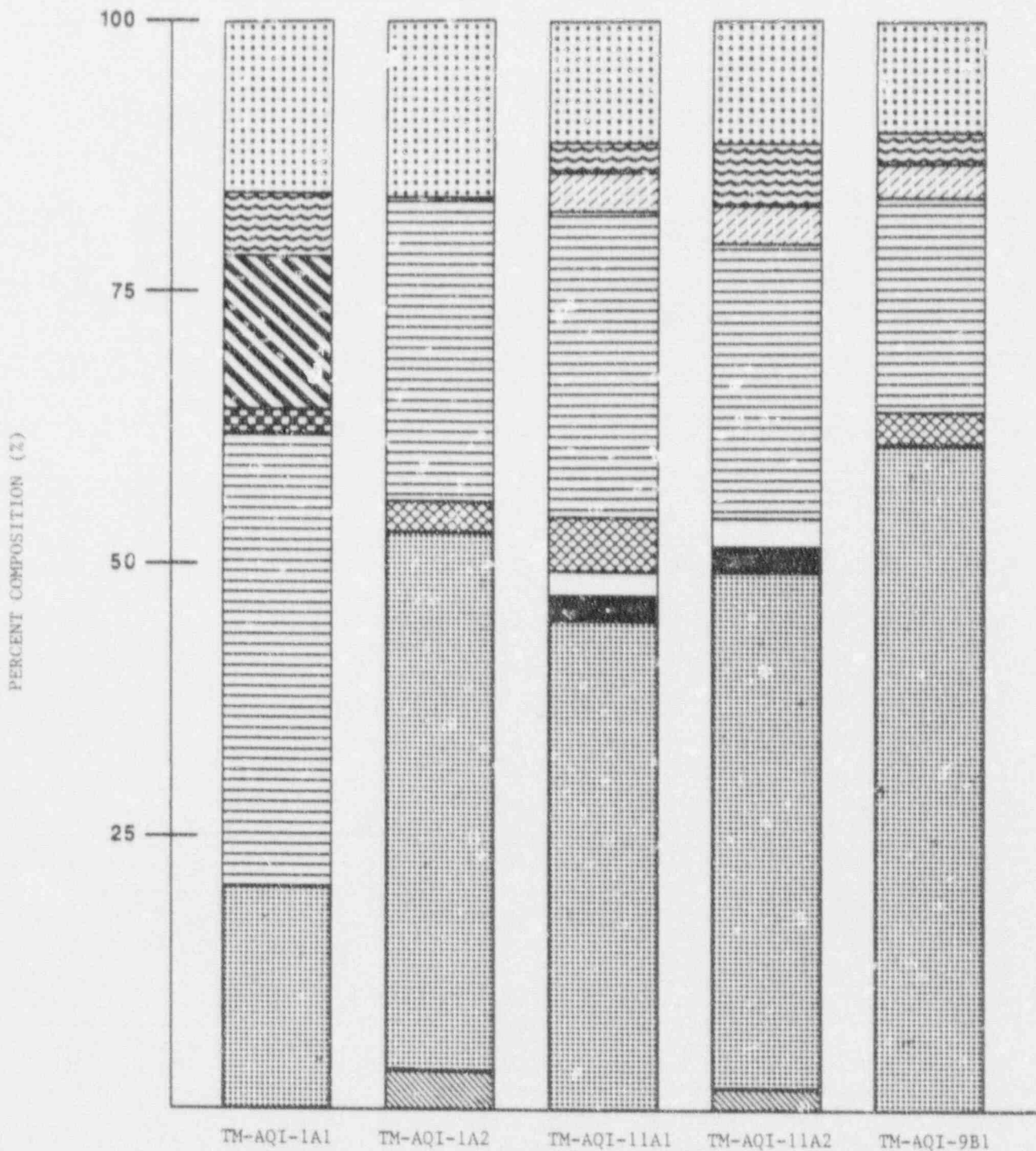
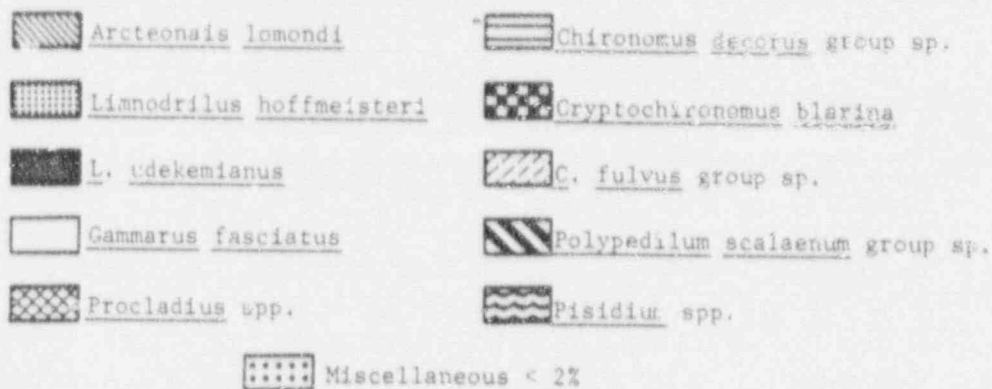


Figure 2.2-1. Percent composition of macroinvertebrate taxa, based on total number of organisms collected at each station in 1982.

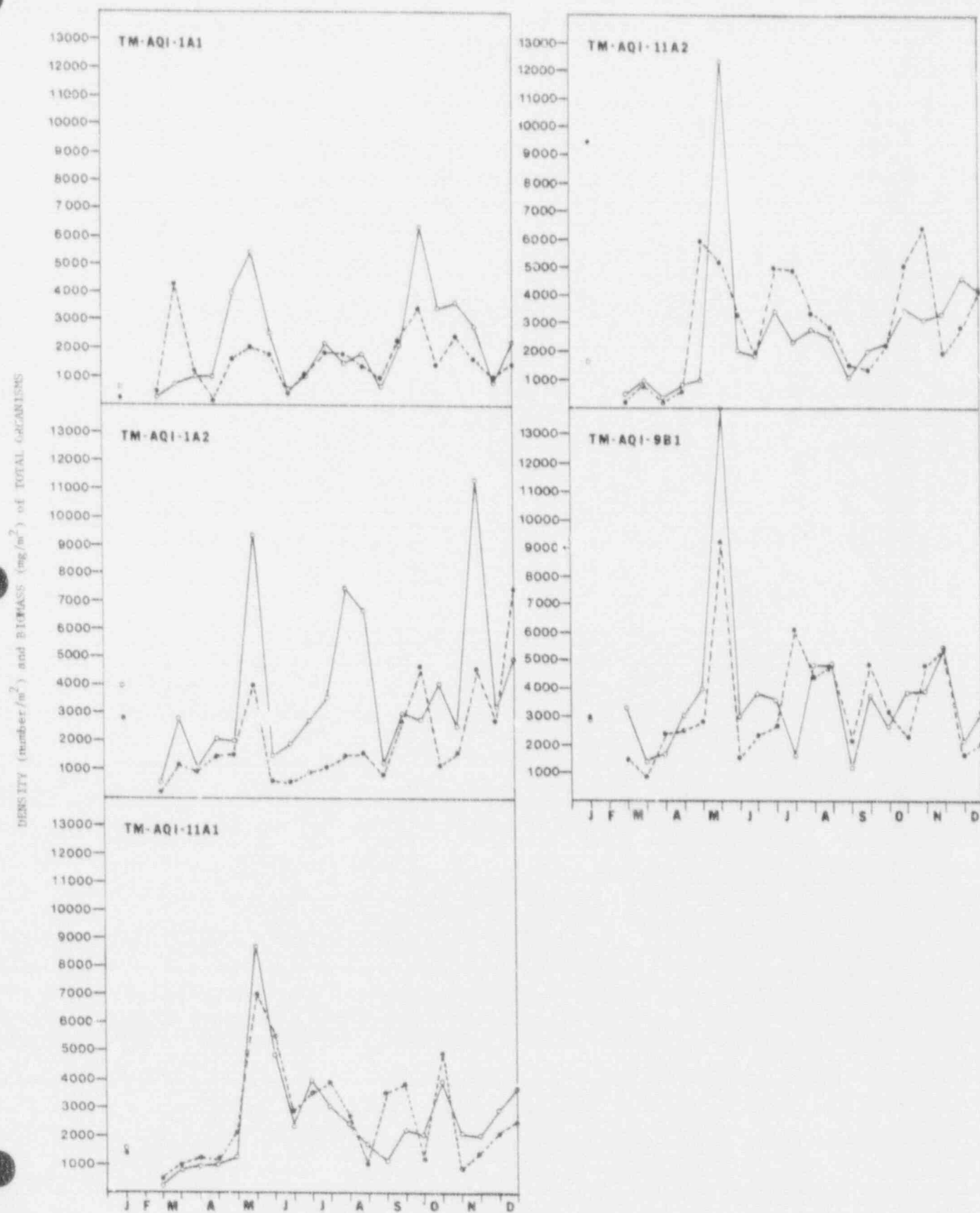


Figure 2.2-2. Seasonal distributions of density (solid line) and biomass (dashed line) of total organisms at the macroinvertebrate stations, 5 January through 16 December 1982. No samples were taken in February due to ice.

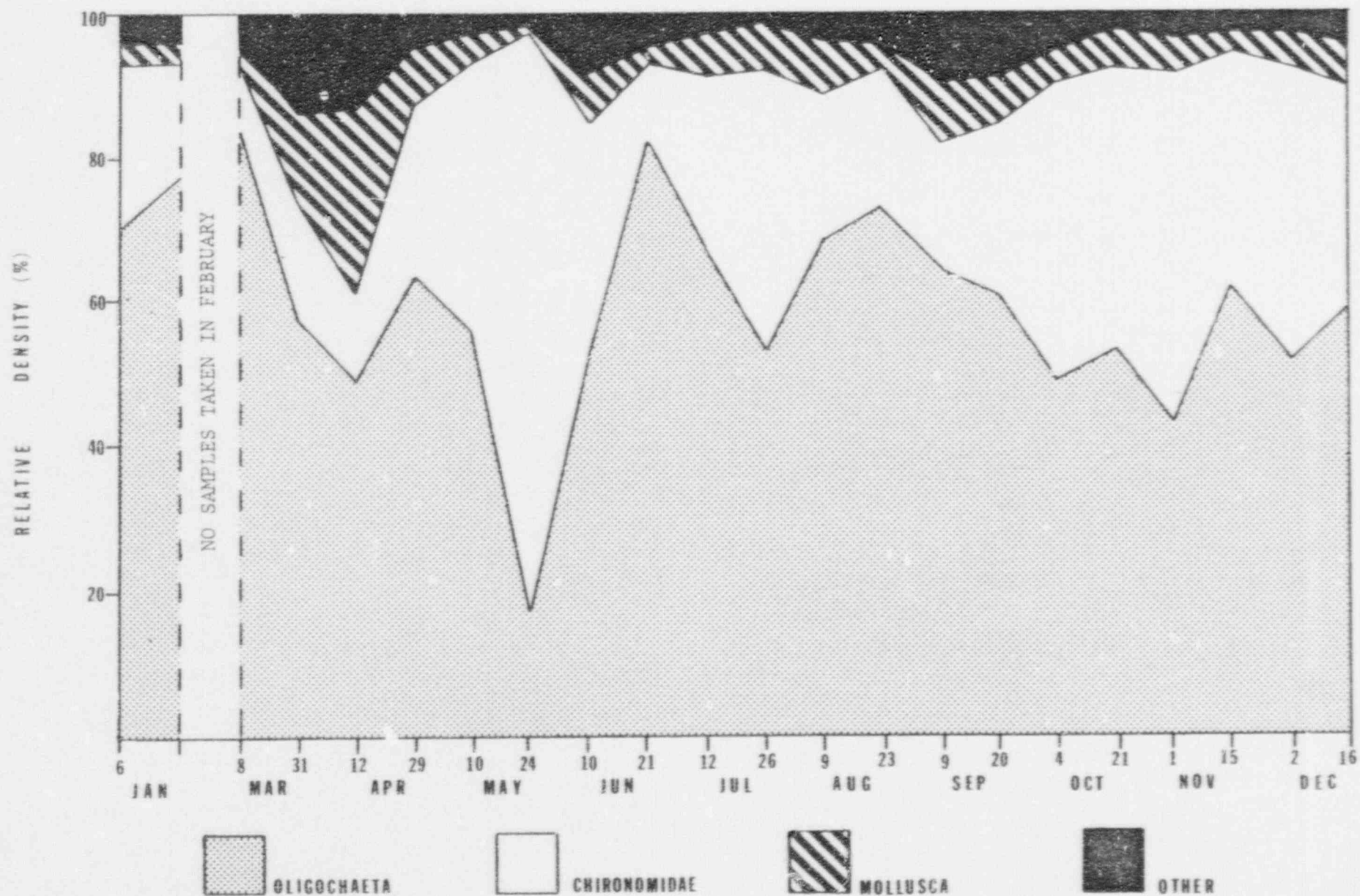


Figure 2-3. Relative density of major macroinvertebrate groups collected on each sample date, 6 January through 16 December 1982.

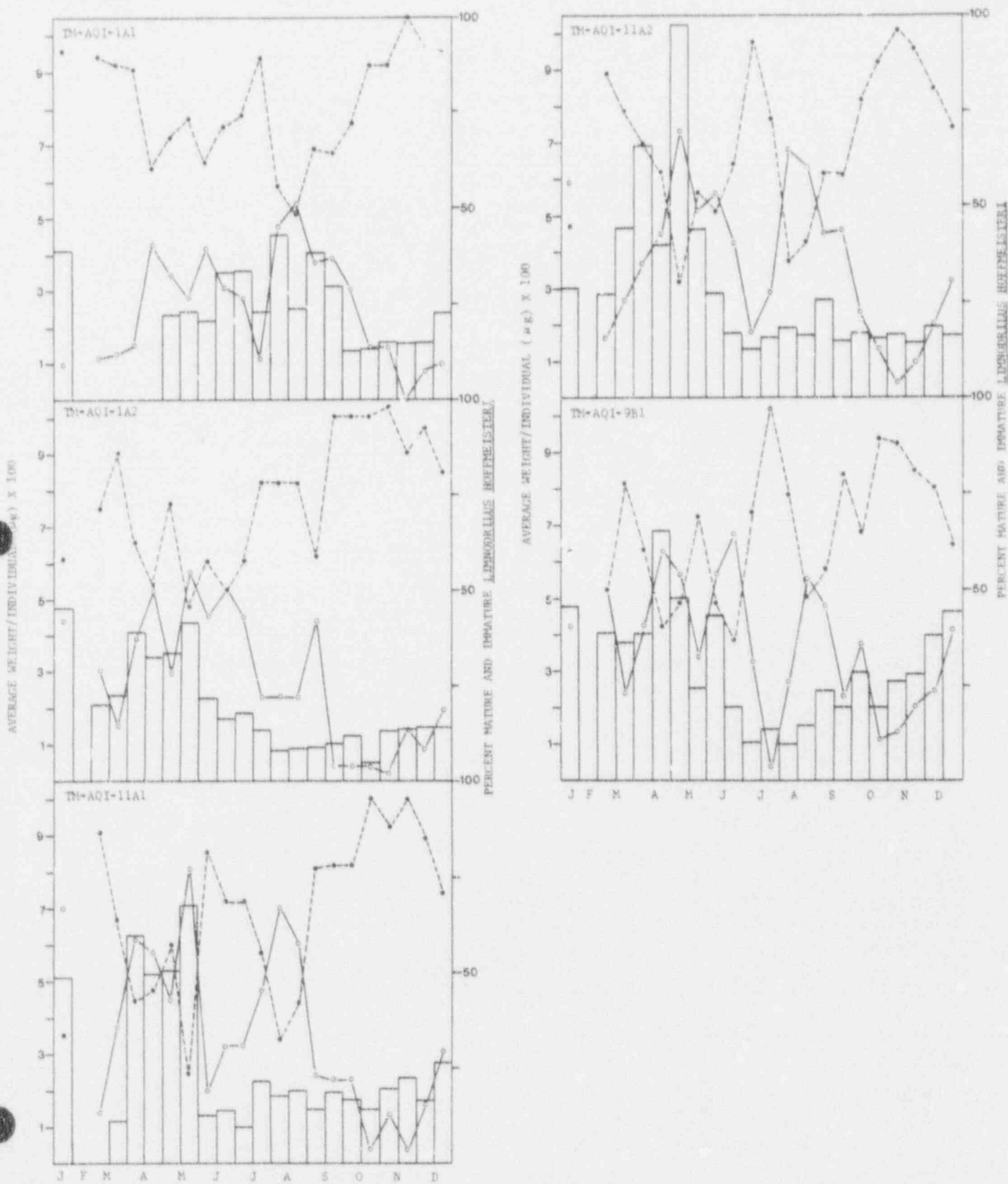


Figure 2.2-4. Comparison of average weight per individual of *Limnodrilus hoffmeisteri* (bar graph), and percent mature (solid line) and immature (dashed line) *L. hoffmeisteri* at each station, 6 January through 16 December 1982. No samples were taken in February.

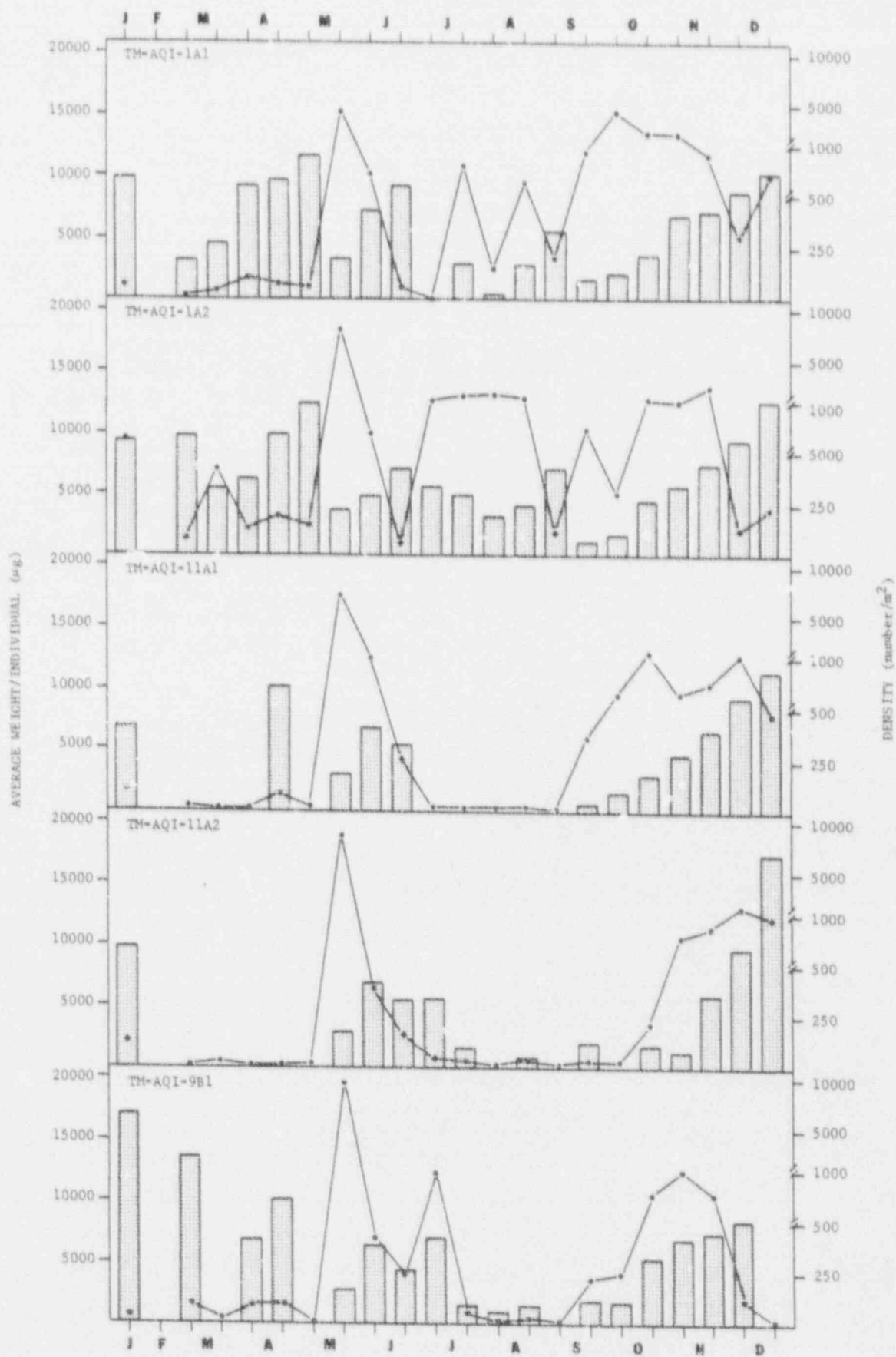


Figure 2.2-5. Average weight per individual of *Chironomus decorus* group sp. (bar graph) and density (line graph) at each macroinvertebrate station, 6 January through 16 December 1982. No samples were taken in February.

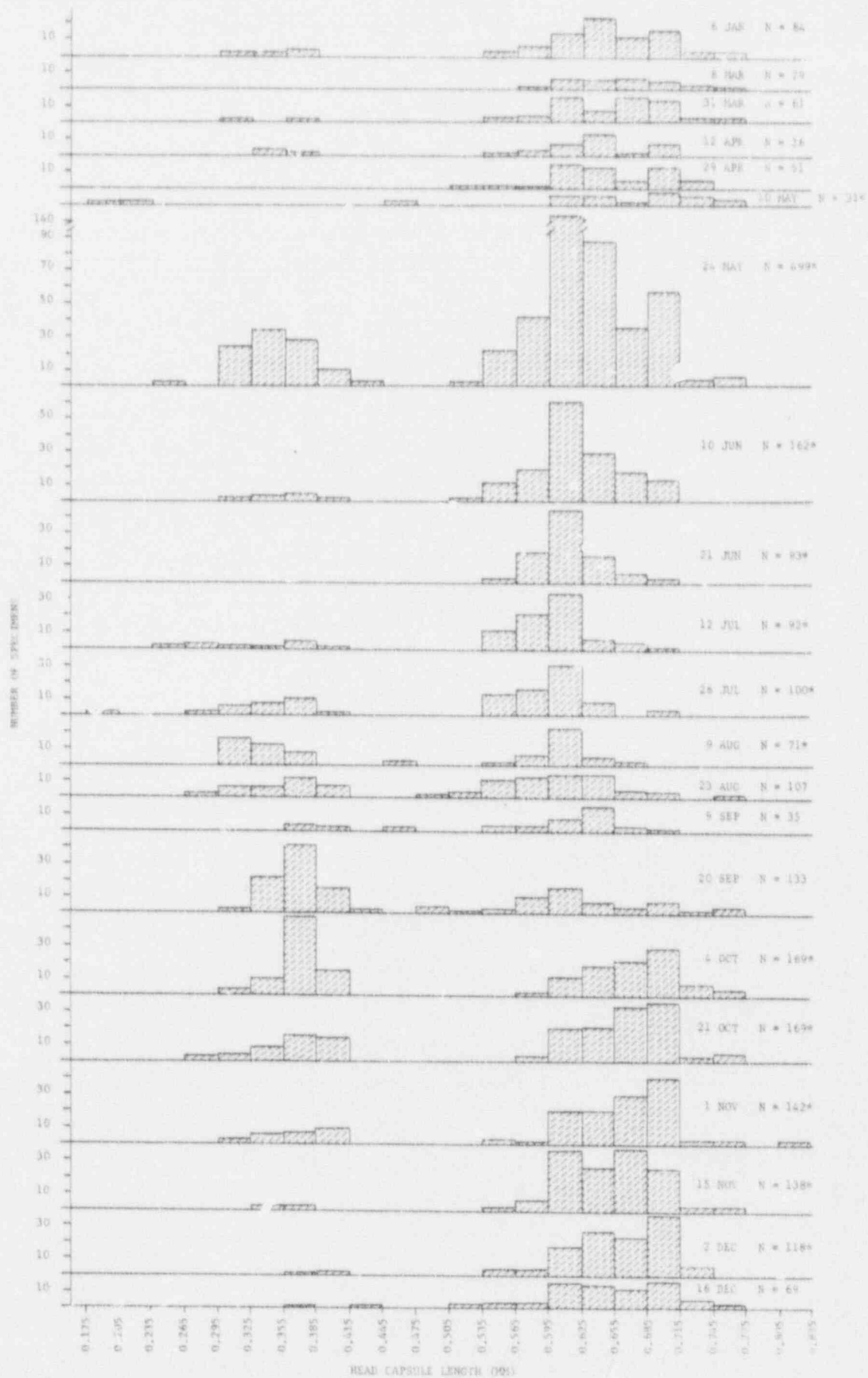


Figure 2.2-6. Head capsule length frequency (mm) distribution of *Diatomus deozoi* group sp. for each sample date in 1982. An asterisk (*) following the number indicated presence of pupae.

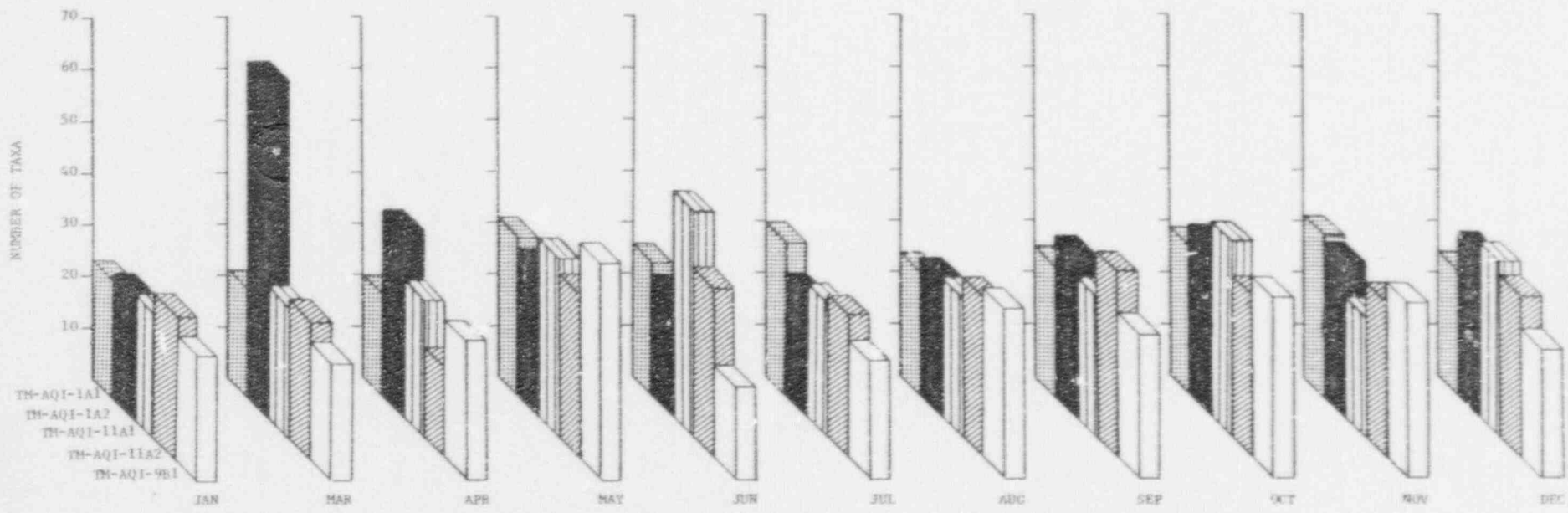


Figure 2.2-7. Numbers of taxa taken at the macroinvertebrate stations, January through December 1982. No samples were taken in February due to ice.



Figure 2.3-1. Range of mean densities of *Limnodrilus hoffmeisteri* and mean river temperature, by sample date 1974 through 1981 compared to 1982, at Station DB-801-1A1.

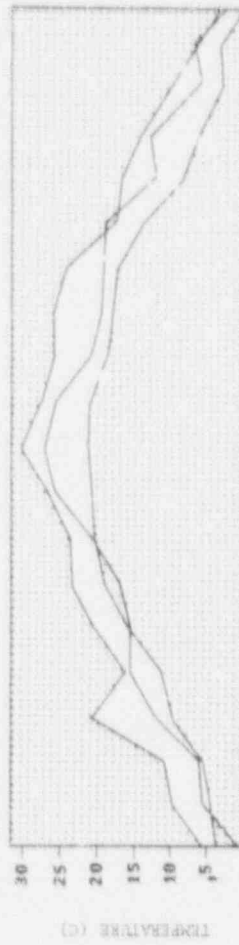


Figure 2.3-2. Range of mean densities of *Limnodrilus hoffmeisteri* and mean river temperature, by sample date 1974 through 1981 compared to 1982 at Station DB-801-1A2.

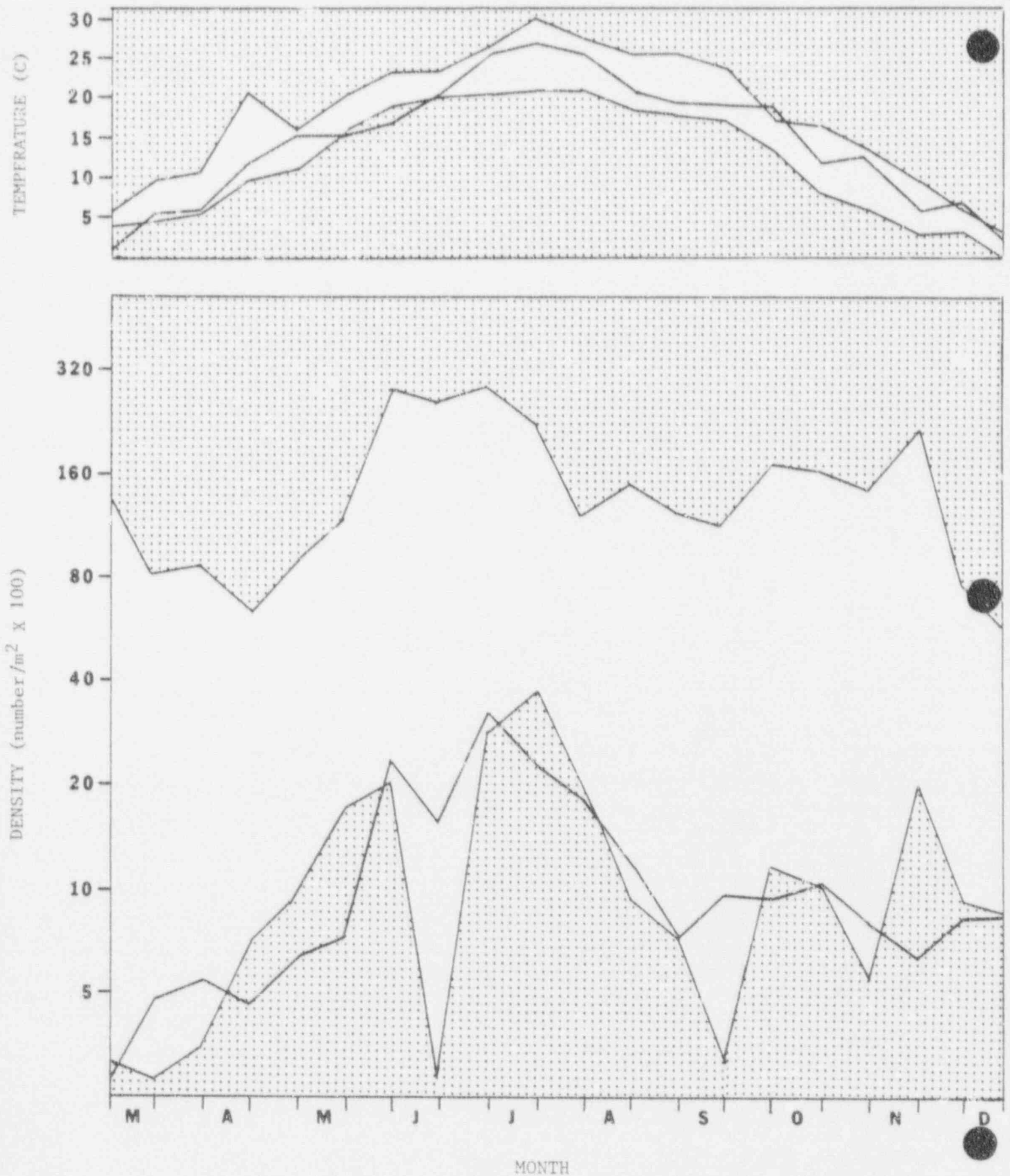


Figure 2.3-3. Range of mean densities of *Limnodrilus hoffmeisteri* and mean river temperature, by sample date 1974 through 1981 compared to 1982, at Station TM-AQI-11A1.

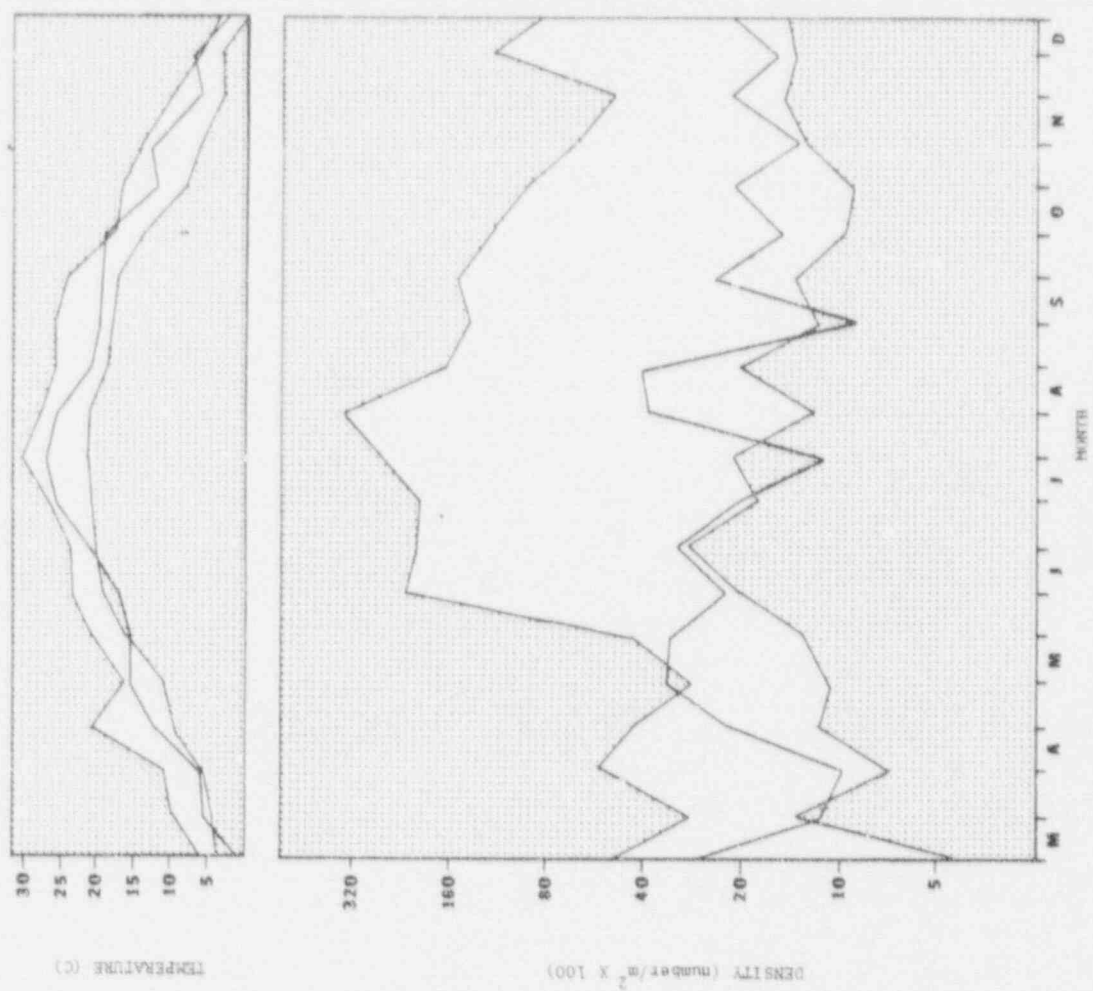


Figure 2.3-5. Range of mean densities of *Limnodrilus hoffmeisteri* and mean river temperature, by sample date 1972 through 1991 compared to 1982, at Station TM-A01-9B1.

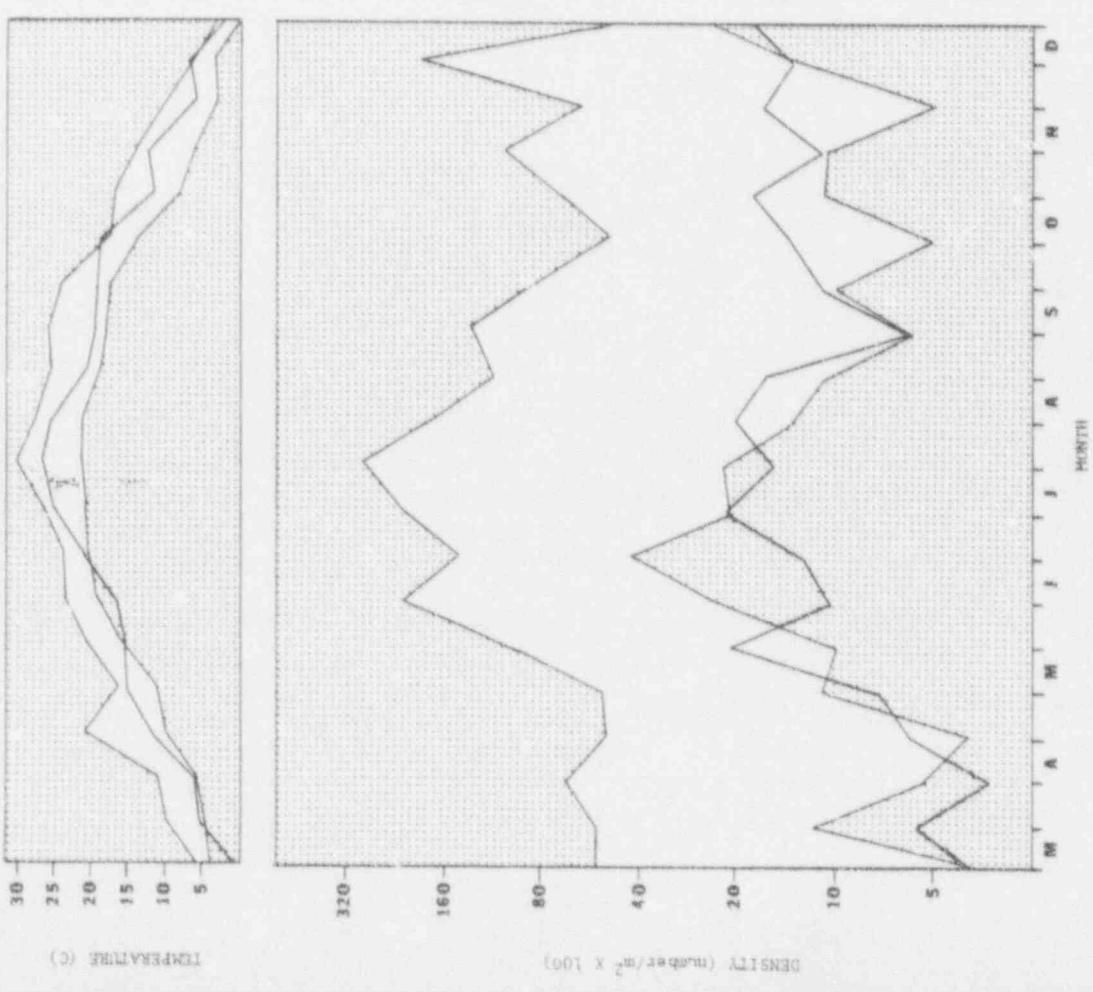


Figure 2.3-5. Range of mean densities of *Limnodrilus hoffmeisteri* and mean river temperature, by sample date 1974 through 1981 compared to 1982, at Station TM-A01-11A2.

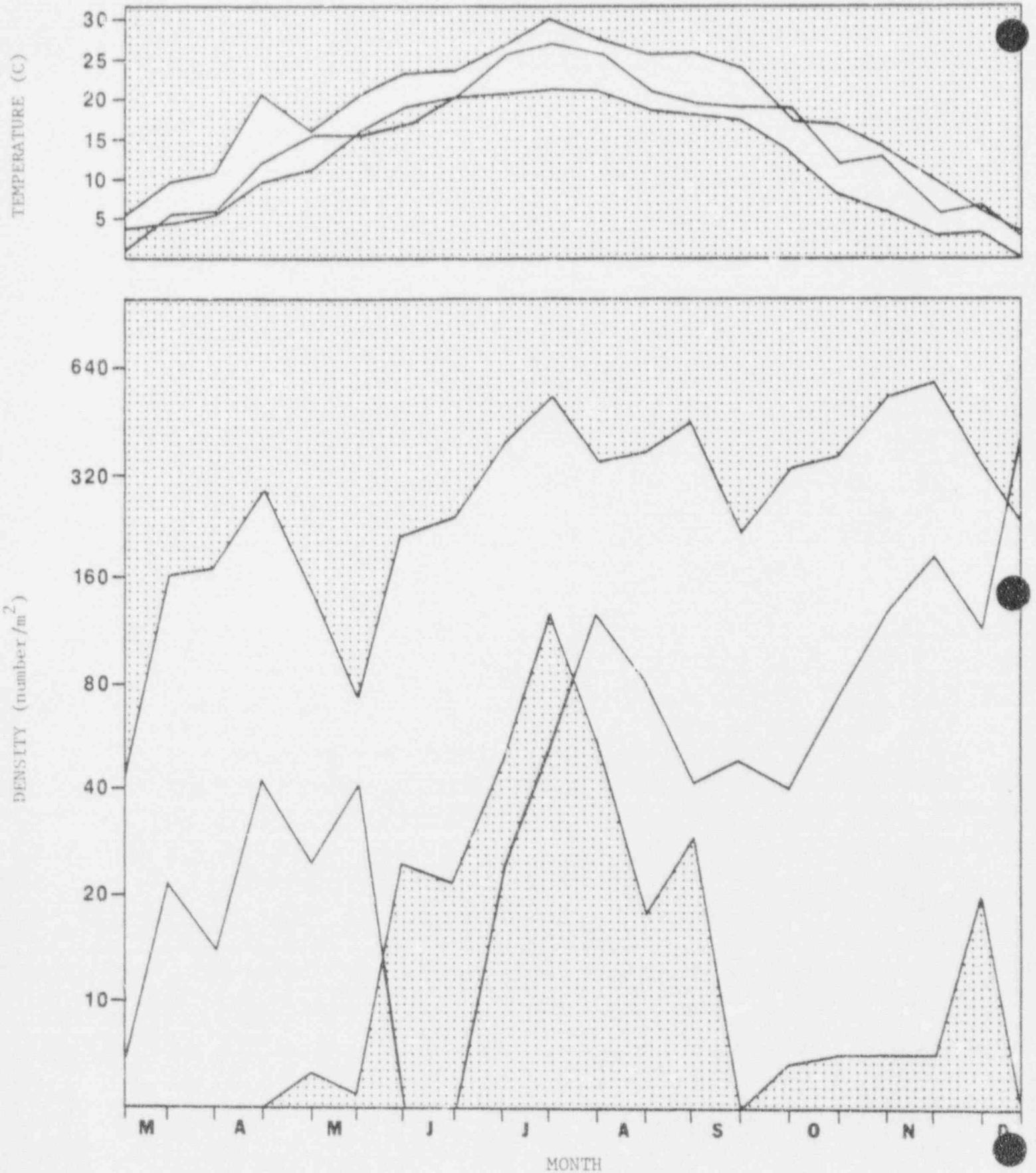
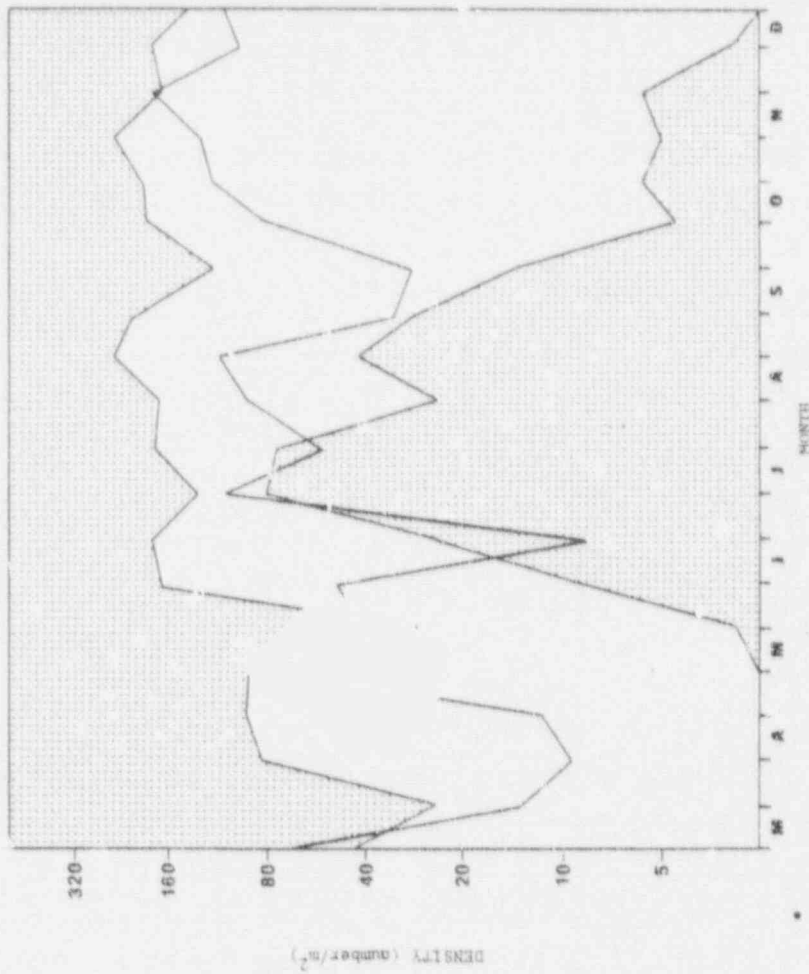


Figure 2.3-6. Range of mean densities of *Procladius* spp. and mean river temperature, by sample date 1976 through 1981 compared to 1982, at all macroinvertebrate stations.

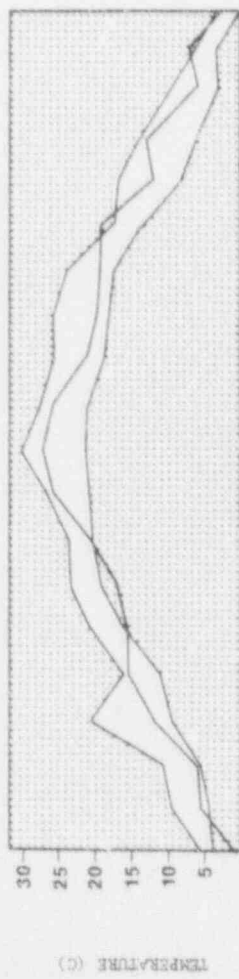


TEMPERATURE (C)

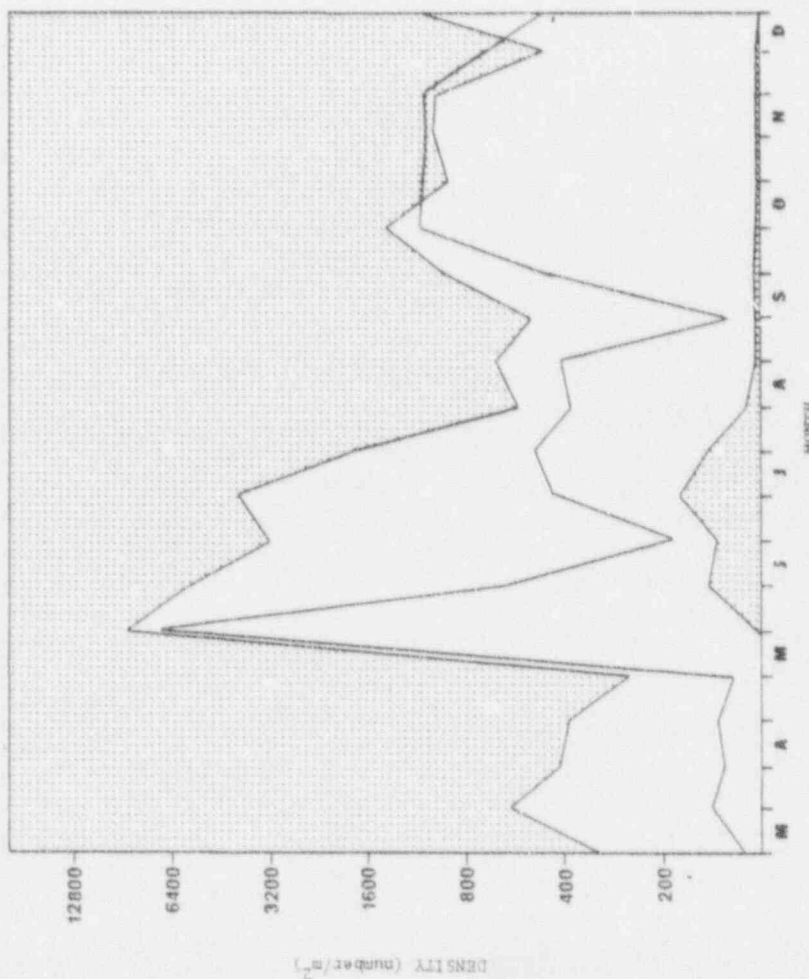


DENSITY (number/m³)

Figure 2.3-8. Range of mean densities of *Cryptochironomus luteus* group sp. and mean river temperature, by sample date 1976 through 1981 compared to 1982, at all macroinvertebrate stations.



TEMPERATURE (C)



DENSITY (number/m³)

Figure 2.3-7. Range of mean densities of *Chironomus decoius* group sp. and mean river temperature, by sample date 1976 through 1981 compared to 1982, at all macroinvertebrate stations.

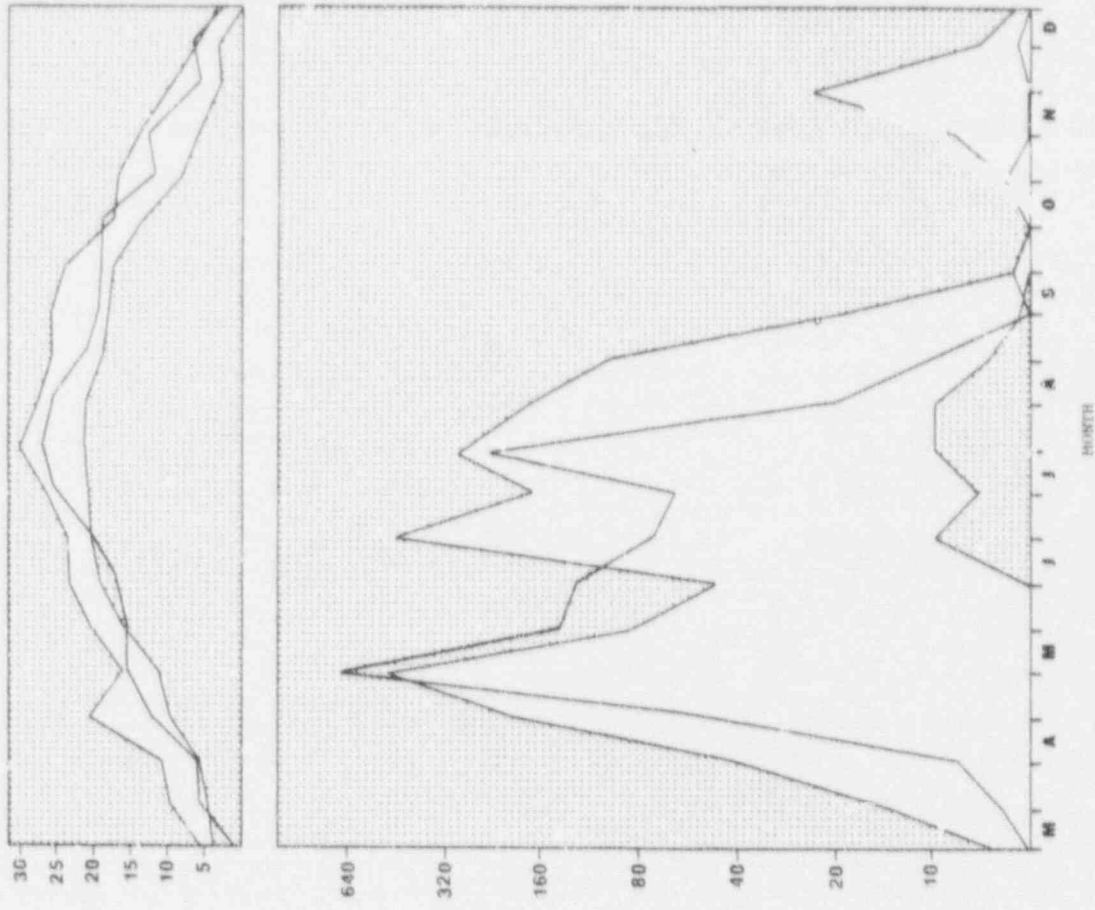


Figure 2.3-9. Range of mean densities of *Elysiptilum halteralis* group sp. and mean river temperature, by sample date 1976 through 1981 compared to 1982, at all macroinvertebrate stations.

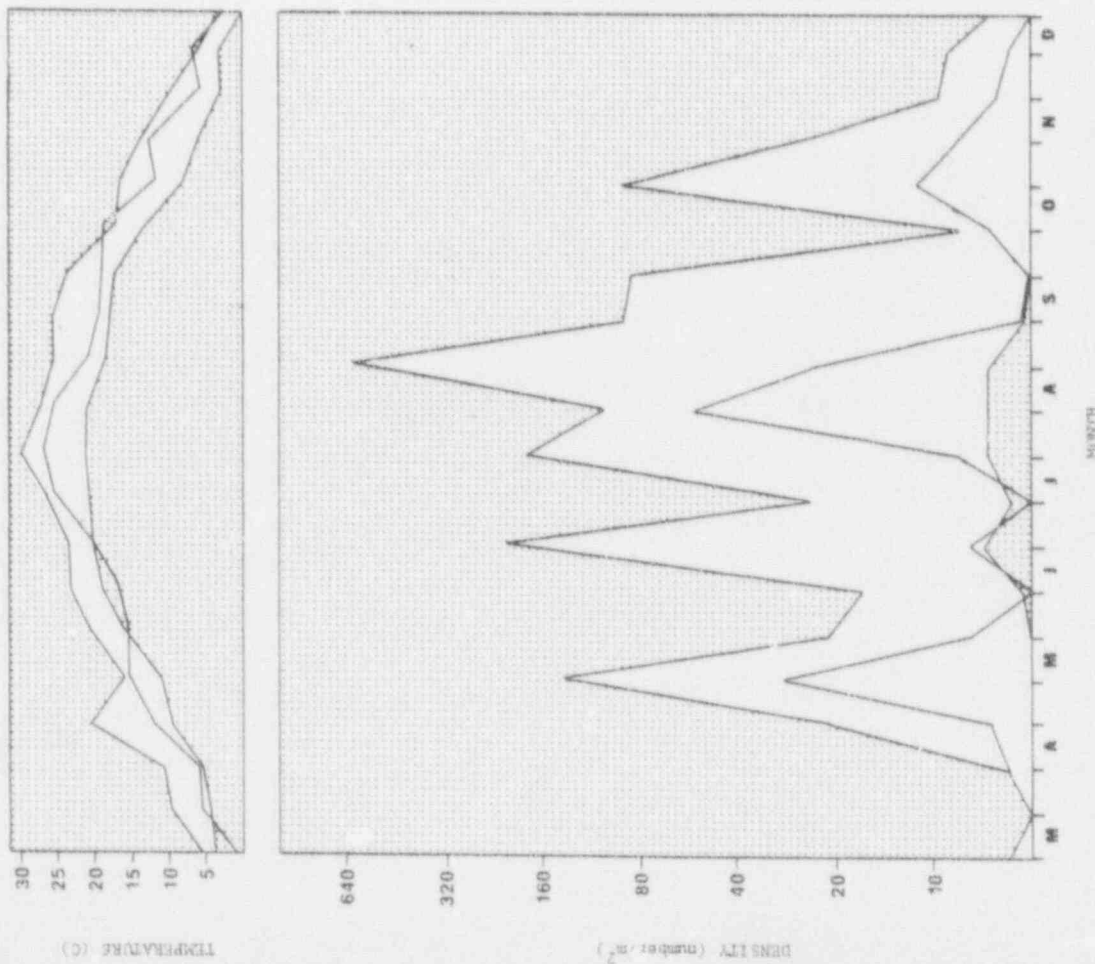


Figure 2.3-10. Range of mean densities of *Elysiptilum* group sp. and mean river temperature, by sample date 1976 through 1982 compared to 1982, at all macroinvertebrate stations.

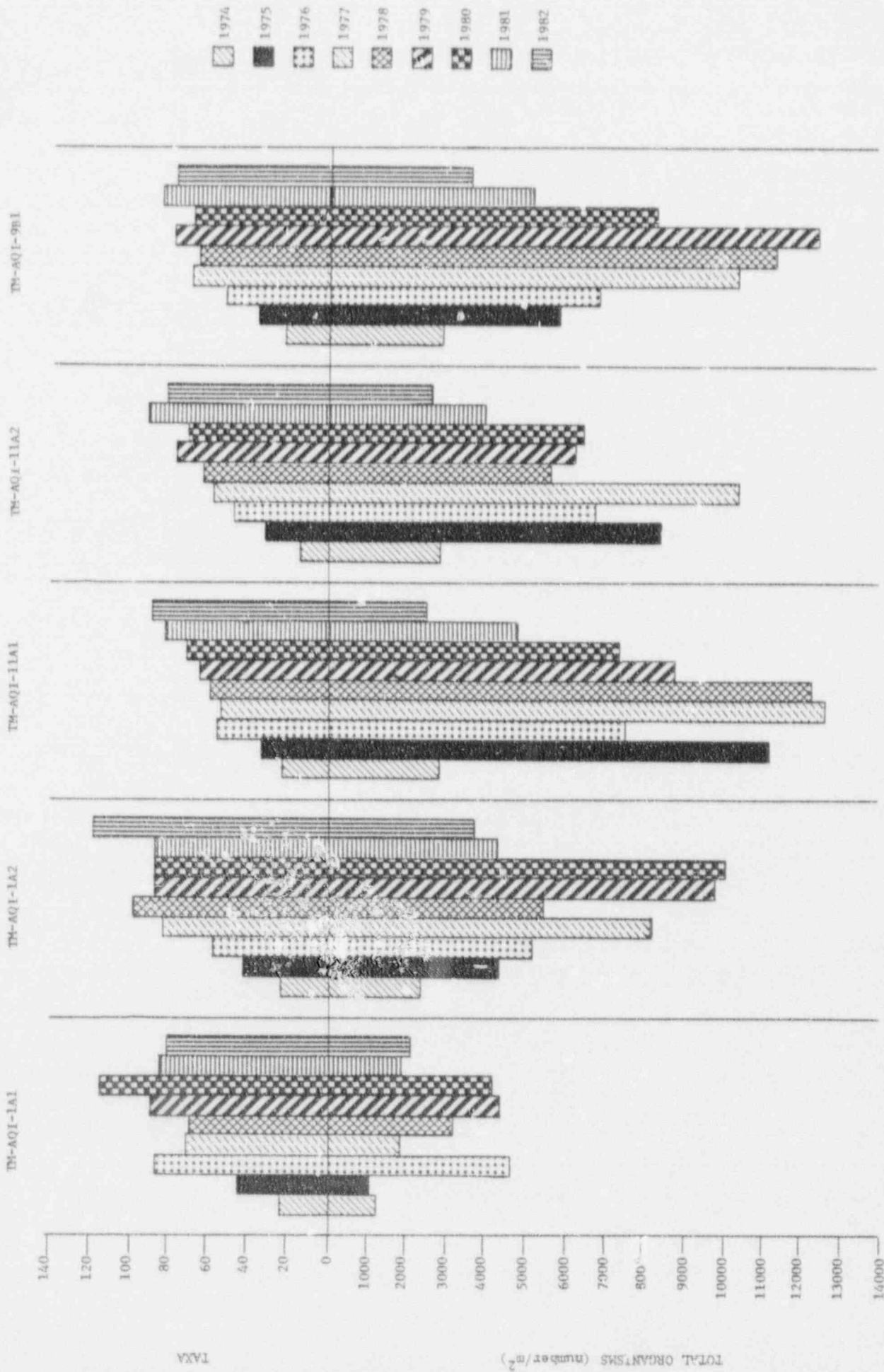


Figure 2.3-11. Number of taxa and total number of organisms at the five macroinvertebrate stations, 1974 through 1982.

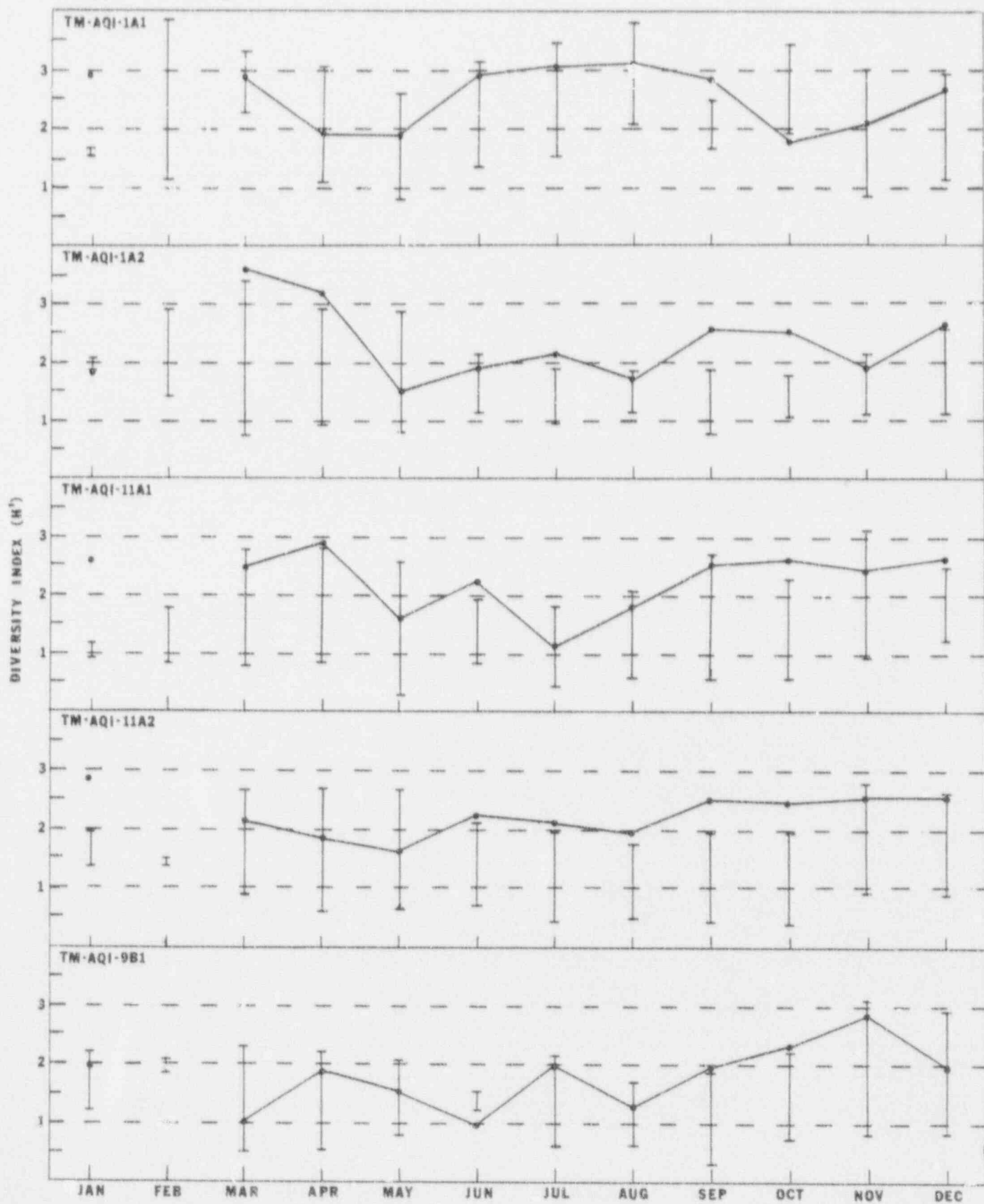


Figure 2.3-12. Range of diversity (H') values at the macroinvertebrate stations, 1974 through 1981 (vertical line) compared to 1977 (solid line).

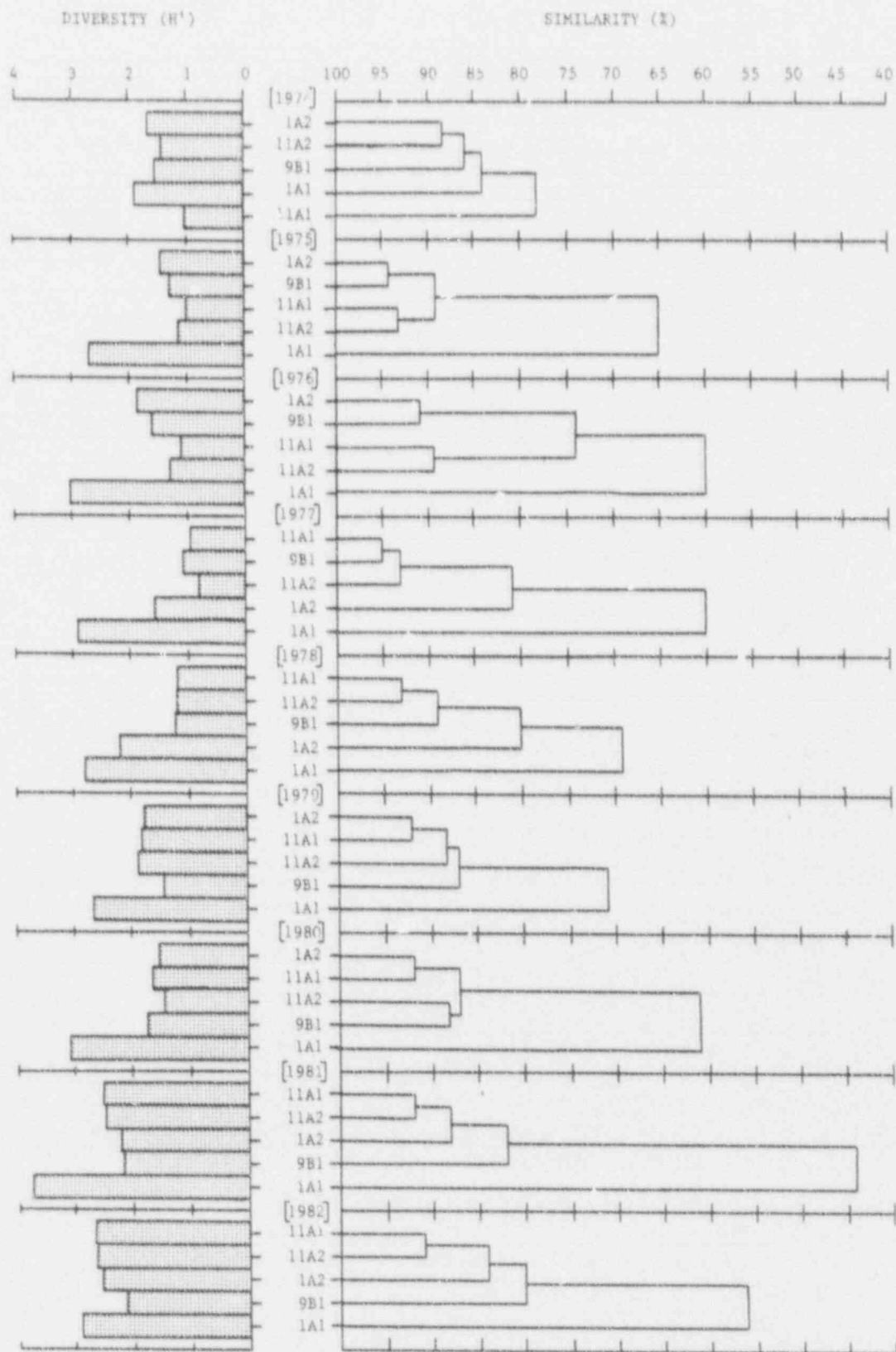


Figure 2.3-13. Diversity and site clustering based on percent similarity at the five macroinvertebrate stations, 1974 through 1982. Prefix TM-AQI- deleted for figure.

3.0 ICHTHYOPLANKTON

Ichthyoplankton in York Haven Pond were monitored to (1) determine temporal and spatial abundance, distribution, and composition; and (2) provide data for estimates of entrainment by TMINs.

3.1 METHODS

Day and night samples were taken weekly at 14 stations in York Haven Pond, April through August 1982 (Table 3.1-1 and Figure 3.1-1). Stations were sampled in random order on each date to minimize the bias of time (Nardacci and Associates 1979). Day (after 0800 h) and night (after sunset) samples were taken about 12 hours apart.

At each station, two replicate surface samples (designated A and B) were taken with paired 0.5 m plankton nets (0.5 mm mesh) fitted to square frames set off the front of a boat. The boat was powered upstream along 200 m of shoreline at 10 to 20 m offshore for four minutes. Water depth at most stations varied from 1.0 to 1.5 m.

Water volume filtered was measured with a General Oceanics digital flowmeter mounted in the center of each net mouth. Each flowmeter was calibrated semiannually, checked weekly during the sampling season for clogging problems, and repaired or replaced when necessary.

Physicochemical data recorded for all collections were time, air and surface water temperatures, dissolved oxygen concentration, pH, surface water velocity, and water transparency (by secchi disc - day samples only). On each date, river flow (at 0700 h) was obtained from the River Forecast Center in Harrisburg, Pennsylvania. Heating degree days, calculated

at the Harrisburg International Airport weather station, were obtained from the National Oceanic and Atmospheric Administration (NOAA) in Asheville, North Carolina. Daily river temperature (for regression) was taken from the "TMI Monthly Discharge Operating Report" prepared by GPU Nuclear Corporation, Middletown, Pennsylvania. Day length was obtained from the 1982 "Agricultural Almanac" for Lancaster, Pennsylvania (Lestz 1981).

Samples taken in the field were immediately fixed in a 20 to 25% formalin solution. Later, samples were rinsed in the laboratory and specimens were sorted from debris and stored in vials in a 10% formalin solution until identification. A 3 to 5% formalin solution was used for final storage.

Specimens were examined under a stereoscopic dissecting microscope, identified to the lowest feasible taxon, measured, and enumerated. Identifications were made with the aid of keys and descriptions presented in Nardacci and Associates (1981, 1982). Descriptions, notes, and sketches provided by other Ichthyological Associates, Inc. projects also were used. Darrel E. Snyder (Larval Fish Laboratory, Colorado State University, Fort Collins, Colorado) and Jane M. Gerlach (Consultant, West Chester, Pennsylvania) verified clupeid identifications.

Most specimens were identified to species. Some damaged specimens too distorted to identify were tabulated as unidentifiable. Larvae of the genera Notropis and Lepomis indistinguishable to species were assigned to and/or categories indicating the probabilities. Undamaged

specimens were measured to the nearest 0.5 mm interval (total length, TL or fork length, FL when applicable) with an ocular reticle or a Helios precision dial caliper. All specimens were counted; a maximum of 100 individuals of any one species was measured per replicate. Length data for each species were categorized into larvae and young. The larval stage was defined as the early development after hatching during which the yolk sac and larval finfold were absorbed, and the fins and fin rays were formed. The larval stage was subdivided into protolarva, mesolarva, and metalarva after Snyder (1976) and was explained in Nardacci and Associates (1978).

In this report, the term young was used to designate fish spawned during the current season which were fully transformed larvae, characterized by complete absorption of the larval finfold and attainment of the adult complement of rays and spines in a \bar{x} fins. Fish longer than 25.0 mm FL were not reported.

3.1.1 DATA ANALYSIS

Numbers of fish caught were standardized by converting to density (number per 100 cubic meters of water, $n/100 \text{ m}^3$). Tabular calculations and analyses were done on a Sperry-Univac 90/70 computer. Biomedical computer programs (Dixon 1975) were used for most statistical tests.

Most statistical tests were run on logarithmic transformed densities [$\log_{10} (x + 1)$, where x = density in $n/100 \text{ m}^3$] to linearize and normalize the data. Results of chi-square and frequency tests on 1977 data indicated that log transformations better normalized the data (Nardacci

and Associates 1978). A logarithmic transformation was further suggested by a positive correlation of means with their variances. The distribution of residuals (errors) of 1982 data was tested for gross violation of assumptions (Green 1979). Residuals of nontransformed density data indicated minimal skewness but a large amount of kurtosis (77.79). Transformation reduced kurtosis to 1.33 and the distribution of error terms was nearly normal. Logarithmic transformation has been commonly used for statistical analyses of fish, ichthyoplankton, and zooplankton (Cada et al. 1980, Hodson and Conn 1977, Jacobsen 1979, Kernehan et al. 1975, Krause and Van Den Avyle 1979, Lewis and Siler 1980, Mathur et al. 1980, Richkus 1980, Storck et al. 1978, Thomas et al. 1978).

Day and night data were computed and tabulated separately. Analyses for pond-wide trends were limited to night data because of the more robust data set (fewer zeros and higher numbers). Computed ratios were simply night numbers (or density) divided by day numbers (or density) (N/D). Day/night catch differences were investigated with Kendall's measure of rank correlation test, τ (Conover 1971). Kendall's τ was calculated from the pooled catch of the 14 stations to determine the degree of correlation between day and night species composition.

To strengthen the use of the regression model developed in 1980 (Naruacci and Associates 1981), a polynomial regression was run on the 1982 day and night densities to determine the best relationship. The 1980 regression model, to predict day densities from night data, was fitted with the 1982 data to test predictability. This model was based on the pooled log transformed densities to reflect pond-wide trends.

An analysis of covariance (ANCOVA) on 1978 through 1982 day and night densities was done to establish if the slopes of the regression lines in the day/night relationship each year were significantly different.

The Discharge regression model (Nardacci and Associates 1981), to predict Discharge densities from densities at Stations 13A2 and 16A1 (located directly upstream of the Discharge), was tested with 1982 data.

A three factor analysis of variance (ANOVA) test (Sokal and Rohlf 1969) was used to ascertain the effects of stations, dates, and replicates on 1982 ichthyoplankton densities. The Student-Newman-Keuls multirange test (SNK) was applied to identify means not significantly different (Woolf 1968). The 95% confidence level ($P \leq 0.05$) was used for all tests, unless noted otherwise.

Since past data have indicated ichthyoplankton populate areas close to shore, a paired t-test was applied to test for differences in the catch between the nearshore and the offshore nets. The replicate A net is closest to shore at Stations 14B1, 15B1, 12B1, 13A1, 4A1, 10B1, and 10B3, while the B net is closest to shore at 1B1, 12A1, 13A2, 10B2, 9B1, 11A1, and 16A1. Data (1977 through 1982) were tested to detect the introduction of bias by either net catch that would be undetected by the ANOVA.

Spawning in fishes has been related to increasing daylight and rising temperature (Hynes 1970, Scott and Crossman 1973). Stepwise

multiple linear regressions (MLR) (Sokal and Rohlf 1969) were used to investigate relationships between 1982 and 1977 through 1982 ichthyoplankton densities (dependent variables) and day length, cumulative river temperature, and heating degree days (independent variables). For the regression, station densities were pooled for each date to reflect pond-wide densities. This decreased the inherent variability caused by station differences and aided in the assessment of general pond-wide trends. The three independent variables were selected through the process of "key factor analysis" described in Poole (1974) and have explained much of the past variability in ichthyoplankton density.

Species diversity indices were calculated to obtain an index of the quality of the fish community at each station and to help detect major species changes from year to year. The diversity index measures richness in species. Natural communities tend to be populated by both a few species with many individuals and many species containing only a few individuals. Highest diversity values result from an even distribution of individuals among the species. Low diversities result when a number of competing species disappear and a few species become much more abundant. Differences in diversity indices over time (years) or between stations may indicate population changes due to water quality, if habitat and all other natural differences have been accounted (Hendricks et al. 1980).

Diversity indices were calculated from date and season totals and were restricted to data sets with more than 50 fish. The Shannon-Weaver

function for mean diversity (H') (Lloyd et al. 1968a, 1968b) described by:

$$H' = \sum_{i=1}^s P_i \log_2 P_i$$

was approximated with the proportion formula (Pielou 1966, Poole 1974, Steucek 1977):

$$H'' = - \left[\sum_{i=1}^s \left(\frac{n_i}{N} \right) \log_2 \left(\frac{n_i}{N} \right) \right] \cdot \frac{s-1}{2N}$$

where H'' = the approximated mean diversity, s = the total number of species in the sample, $\frac{n_i}{N}$ = the observed proportion of individuals in the i^{th} species ($i = 1, 2, 3, \dots, s$), n_i = the number of individuals in species i , and N = the total number of individuals in the collection. To account for bias in the estimate, the correction factor $\frac{s-1}{2N}$ was incorporated (Pielou 1966, Poole 1974). The real diversity (H) can never be known unless all individuals of all species are collected; the latter formula provides the best approximation of H (Pielou 1966, Steucek 1977).

Mean diversity has two components: richness of species and the distribution of individuals among species. The evenness index (e , or equitability) measures the latter component. This was computed from the Shannon-Weaver mean diversity by the expression:

$$e = H'' / \log_b s$$

where H'' = the approximated mean diversity and s = the number of species in the collection (Pielou 1966). $\log b$ refers to the log base used in

the diversity calculation. The e index will be the same number regardless of the log base used, which is advantageous. Diversity indices, on the other hand, vary somewhat depending on the log base used.

Species composition at each station was compared by percentage similarity values after the formula given by Whittaker and Fairbanks (1958):

$$PSc = \sum \min(a,b)$$

where PSc = the percentage similarity and a or b = the percentage a species comprises in either sample A or B, whichever is less. The lesser percentage composition of each species was summed for the two sample comparisons to yield the total PSc value. This index measures the relative similarity of species composition and generally leads to the grouping of communities by major taxa (Whittaker and Fairbanks 1958). Values range from 0 to 100. Values of 80 or greater were considered to represent high similarities for this report.

A single linkage dendrogram (based on PSc values) was constructed to investigate the similarity among stations. The dendrogram allowed a hierarchical representation of station relationships (Pielou 1977). A line drawn across the dendrogram at the desired similarity showed which stations were similar or dissimilar. The more closely grouped stations were most similar to each other.

A simple Bray-Curtis ordination (Poole 1974), which results in a graphical clustering of stations, was performed on PSc values to determine community similarities.

Fishes taken by push net in 1982 are presented in Table 3.1-2. Scientific and common names are taxonomic order of presentation followed Robins et al. (1980).

In this report, some analyses and discussion were limited to night data because they provided a more robust data set and were more indicative of larval fish population dynamics in York Haven Pond. Total catch refers to the combined numbers of fish taken, day and night. Densities refer to means taken at night unless noted otherwise.

3.2 RESULTS

Weekly day and night collections are presented in Tables 3.2-1 through 3.2-40 and summarized in Tables 3.2-41 through 3.2-58. Density and length frequency data for important species are given in Tables 3.2-59 through 3.2-65 and 3.2-66 through 3.2-72, respectively. No fish were taken on 13 and 21 April; these dates were deleted from most tables and figures.

A total of 19,079 ichthyoplankters representing 33 species was taken in 1,120 collections on 20 dates, April through August 1982 (Table 3.2-56). Of the total, 18,490 (96.9%) were larvae and 589 (3.1%) were young (Table 3.2-58). Young were more numerous in night samples, but comprised a higher proportion of the day catch. Night collections yielded 16,011 fish, 83.9% of the total catch. The total night catch was over five times greater than the day catch.

3.2.1 SEASONAL DISTRIBUTION

Weekly mean day and night ichthyoplankton densities, mean river temperature, and daily river flow are plotted in Figure 3.2-1.

River flow was near 500 m³/s in early and mid-May, but heavy rains caused high river flow (>1,000 m³/s) from 31 May through 22 June and in early July (Table 2.1-3, Section 2.0). Despite two brief temperature peaks above 20 C in mid-May and early June, water temperature was below 20 C until after mid-June. Ichthyoplankton densities increased to an early peak of 306.08/100 m³ on 18 May (Table 3.2-55), coinciding with the first 20 C temperature peak. Densities declined during late May and remained low throughout June. The characteristic second peak of ichthyoplankton occurred on 20 July during the centrarchid spawning period, but uncharacteristically yielded the highest density of the season (490.85/100 m³). Day densities were much lower but generally followed similar trends. Maximum mean density during the day occurred on 20 July (77.21/100 m³).

Seasonal succession of species occurred with percids being the first collected. One shield darter and one walleye were taken in April. During May, larvae of the early spawners in the clupeid, cyprinid, catostomid, centrarchid, and percid families were collected. The most numerous species collected in May were gizzard shad, common carp, spottail shiner, quillback, pumpkinseed/bluegill, tessellated darter, banded darter, and shield darter (Table 3.2-57). Number of species taken was greatest on 2 June (22) and was high in late May and early July. Dominance of the major taxa by date is shown in Figure 3.2-2. Early and mid-May samples were dominated by spottail shiner and common carp; quillback dominated throughout June. Pumpkinseed/bluegill were predominant in July, while spotfin shiner dominated most August samples.

3.2.2 SPECIES ACCOUNT

Six families were represented by ichthyoplankton in 1982. Seven taxa comprised over 94% of the total catch: pumpkinseed/bluegill (48.85%), common carp (17.22%), spotfin shiner (10.41%), quillback (7.35%), spottail shiner (5.25%), banded darter (3.49%), and tessellated darter (1.78%) (Table 3.2-56).

A total of 118 clupeids (all gizzard shad) was taken in 1982; most were taken on 18 May (Table 3.2-57). Most were collected from the east channel (4A1) and in front of the TMINS Intakes (13A2) (Table 3.2-56). Nearly 78% were taken at night.

Cyprinids ranked second in family abundance and collectively comprised over 34% of the total catch (Table 3.2-56). The most common cyprinids were common carp, spottail shiner, and spotfin shiner. Mimic shiner indicated a continued population increase from previous totals (Nardacci and Associates 1982); at least 170 were collected, mostly from Station 14B1. Most mimic shiner were taken in late July and August, indicating a tendency for late spawning (Table 3.2-57). Other cyprinids collected were the central stoneroller, golden shiner, comely shiner, swallowtail shiner, bluntnose minnow, blacknose dace, longnose dace, creek chub, and fallfish and collectively comprised less than 0.5% of the total catch.

Common carp abundance recovered from the low numbers taken in 1981 and ranked second in overall abundance (3,285 specimens, 17.22%) (Table 3.2-56). Larvae exhibited two spawning peaks (Figure 3.2-3) as noted

in previous years (Nardacci and Associates 1977, 1978, 1979, 1980, 1981, 1982) and at another Susquehanna River site (Jacobsen 1980, 1981, 1982). Greatest densities were taken on 18 May (Table 3.2-59). Station 9B1 yielded the highest density of common carp, although high densities were also recorded at stations located along west TMI (13A2, 11A1, and 16A1) and at Stations 1B1 and 10B2. Highest density recorded was 760.89/100 m³. Most specimens were protolarvae (Table 3.2-66). Mean length of larvae was 5.9 mm TL.

Spottail shiner ranked fifth and comprised 5.25% of the total catch (Table 3.2-56). They were collected from 4 May through 20 July (Table 3.2-60); density peaked on 18 May. Most were taken at the TMINS Intake (13A2) and Discharge (11A1) stations. Highest density recorded was 124.16/100 m³ on 11 May. A major spawn occurred from early to mid-May followed by a minor spawn in late June (Figure 3.2-3). Most spottail shiner were protolarvae (Table 3.2-67). Mean length of larvae was 6.0 mm TL.

Spotfin shiner ranked third in abundance comprising 10.41% of the overall catch (Table 3.2-56). Larvae were collected from 18 May through 24 August, but the catch was sparse until 30 June. Peak density occurred on 16 August with the highest density recorded at Station 14B1 (209.54/100 m³) (Table 3.2-61). During August spotfin shiner comprised 71 to 91% of the night catch (Figure 3.2-2). Highest densities were collected from Stations 14B1 and 10B2. Mean length of larvae was 9.0 mm TL. Young were first taken on 20 July (Table

3.2-68). Protolarvae comprised only 37.68% of the total, but their presence throughout the summer indicated fairly steady spawning from late June through August.

Catostomids were represented by quillback, white sucker, northern hog sucker, and shorthead redhorse (Table 3.2-56). Quillback ranked fourth in overall abundance (7.35%). Most were taken at stations located along west TMI on 25 May and 2 June. Highest density (183.61/100 m³) occurred on 2 June at Station 13A2 (Table 3.2-62). Quillback dominated the catch in mid- and late June (70 to 78% of the night catch), when other species were low in abundance (Figure 3.2-2). Average length of larvae was 8.4 mm TL. Most (96.39%) were protolarvae (Table 3.2-69). All other catostomids comprised less than 2% of the total catch. A total of 297 shorthead redhorse was taken; it ranked eighth in overall species abundance and fifth in daytime collections.

Ictalurids accounted for 0.41% of the total catch; 77 channel catfish and one yellow bullhead were collected (Table 3.2-56). Most were taken on 13 July (Table 3.2-57). Larvae appeared only after river temperature reached 25 C, as noted in previous years (Nardacci and Associates 1977, 1978, 1979, 1980, 1981, 1982). All ictalurids were taken at night.

Centrarchids were the most abundant family taken in 1982, with pumpkinseed/bluegill larvae and young comprising 48.85% of the total catch (Table 3.2-56). Other centrarchids taken were the rock bass, redbreast sunfish, smallmouth bass, largemouth bass, white crappie, and black crappie; these together comprised less than 1% of the total catch.

Pumpkinseed/bluegill were most numerous during 13 through 27 July (Table 3.2-57) and comprised 86 to 93% of the night catch during this period (Figure 3.2-2). Highest density (5,527.40/100 m³), a record for the study, occurred at Station 14B1; density was also high at 4A1 (Table 3.2-53). Mean larval length was 7.0 mm TL, but most collected were between 5.0 and 6.0 mm TL (Figure 3.2-4). Protolarvae accounted for 60.52% of the specimens (Table 3.2-70). This taxon was most numerous at night, but comprised over 65% of the day catch. The main spawning time extended from late June through early August, after the river flow (<1,000 m³/s) and water temperature (>20 C) stabilized.

Percids were the fourth most abundant family with specimens of tessellated darter, banded darter, yellow perch, shield darter, and walleye together comprising 5.77% of the catch (Table 3.2-56).

Tessellated darter ranked seventh overall with 1.78% of the total catch (Table 3.2-56). They were collected during 4 May through 13 July (Table 3.2-57). Most were taken on 18 May; Stations 12A1 and 1B1 yielded most larvae. Highest density recorded was 66.49/100 m³ (Table 3.2-64). Mean length of tessellated darter larvae was 6.1 mm TL. Protolarvae were the most abundant life stage (92.83%); most spawning occurred in May (Table 3.2-71).

Banded darter ranked sixth overall comprising 3.49% of the total catch (Table 3.2-56). Most were taken on 2 June; highest density recorded was 68.85/100 m³ at Station 13A2 (Table 3.2-65). They were most numerous at Stations 14B1 and 13A2. Mean length of larvae was 6.6 mm TL. Protolarvae were the most numerous life stage (94.61%) (Table 3.2-72). Spawning extended during early May through early July.

3.2.2 ANOMALIES AND PARASITES

Anomalies or deformities were observed on 50 specimens (0.31%) of the fish taken at night. Jaw and eye malformations were most common. Tumors or growths were noted on one channel catfish and a rock bass. Fifteen fish (0.09%) were parasitized by the anchor worm, Lernaea. The presence of Lernaea was usually accompanied by emaciation. Glochidia were attached to the lips and fins or in the gut of 12 cyprinid larvae, mostly in August. Fish were often emaciated when glochidia were attached to the lips. Black spot was noted on two spotfin shiners.

3.2.4 SPAWNING PERIODS

Seasonal abundance (density) of the seven most common taxa and the relative abundance of protolarvae are shown in Figure 3.2-3. The spawning period for each taxon was assumed to be about 5 to 10 days before yolked larvae appeared in samples. Most fertilized eggs hatch after 3 to 10 days of incubation depending upon season, water temperature, and species (Hardy 1978, Jones et al. 1978). Early spring spawning fishes (suckers and perches) hatch after a longer incubation (5 to 10 days) than late spring (carps and minnows) or summer (sunfishes and catfishes) spawners (3 to 7 days). The presence of protolarvae (mostly yolk sac larvae) indicated recent hatching, as the yolk is absorbed within a few days.

The 1982 spring spawning season was disturbed by unusually high river flow during late May through late June. Densities of all spring spawned larvae declined during June (Figure 3.2-3). Common carp,

quillback, and to a lesser degree spottail shiner exhibited secondary spawns after river flow declined and water temperature increased in late June. Centrarchids began spawning and hatching in May after water temperature reached 20 C, but larvae were virtually absent during much of June. Larvae of summer spawned species appeared in late June and July after water temperature remained above 20 C. These included golden shiner, mimic shiner, spotfin shiner, channel catfish, redbreast sunfish, and pumpkinseed/bluegill. The appearance of most of these species in July rather than June indicated a delay of spawning caused principally by the unusual water temperature and river flow conditions.

3.2.5 ANOVA RESULTS

The three factor ANOVA results on 1982 data are presented in Table 3.2-73. Date accounted for the most variation in densities; station and the station-date interaction were also significant. The SNK indicated that densities on 18 May were significantly higher (resulting from more even distribution of densities among the stations) than all other dates (Table 3.2-74). Densities on 25 May, 2 June, and 13 and 20 July were the next highest and were not significantly different from each other. Low densities occurred early and late in the sampling season (4 May and 24 August) and during unseasonably high river flow periods (10 and 15 June, and 6 July).

Stations 14B1 and 10B2 were ranked highest and significantly different from all other stations and each other (Table 3.2-74). Station 4A1, with frequent low densities but a large overall mean,

ranked similar to five other stations. The ANOVA ranked stations and dates somewhat different than arithmetic means because log transformations minimized the influence of a single station or date catch. Station-date interaction was an expected significant factor because of the spatial and temporal variability among species, habitats, and spawning times.

3.2.6 SPATIAL DISTRIBUTION

Specific species tended to populate certain areas (stations) in York Haven Pond, a phenomenon noted in the past. Common carp were prevalent at Station 10B2 and among the west TMI stations (16A1, 13A2, 11A1, and 9B1) (Figure 3.2-5). Spottail shiner also were more common among the west TMI stations. Spottail shiner were most common in the west channel at Stations 10B2, 14B1, and 12A1, but were also abundant at the center (9B1) and east channel (4A1) stations. Quillback were most common among west TMI stations. Pumpkinseed/bluegill were most abundant in the low flow areas of the west and east channels (Stations 14B1 and 4A1). The tessellated darter and/or banded darter were more abundant at Stations 14B1, 12A1, 1B1, and along west TMI.

Station densities (means) are given in Table 3.2-55 and illustrated in Figure 3.2-5. Mean density at Station 14B1 was the highest recorded and Station 4A1 ranked second; both had high abundances of pumpkinseed/bluegill larvae. Stations 15B1, 13A1, and 10B1 yielded the lowest overall densities.

The paired t-test on 1982 nearshore and offshore net catches indicated no significant difference ($P \leq 0.05$) between the replicate catches (nearshore net mean density = 100.9, offshore net mean = 101.6, $t_{cal} = 0.319$).

This indicated that no bias was introduced to the data due to net position.

3.2.7 DIEL DISTRIBUTION

Fish taken at night outnumbered those taken during the day by a factor of 5.2 (Table 3.2-57). On individual dates the N/D ratio varied from 0.6 (10 June) to 38.6 (11 May). Ratios of the 252 paired day/night samples (at all 14 stations) ranged from 0.06 to 209.50; only 29 (11.5%) of the paired sets had higher densities during the day.

Most species were taken more often at night. Highly nocturnal species (\geq 90% taken at night) included common carp, golden shiner, spottail shiner, quillback, channel catfish, and redbreast sunfish (Table 3.2-56). In addition over 85% of spotfin shiner, rock bass, and tessellated darter were taken at night. Some species were relatively common in day samples ($>$ 30%) and included the comely shiner, white sucker, shorthead redhorse, smallmouth bass, and banded darter. Day and night samples were more similar than dissimilar in their species composition by PSc (69.7) and Kendall's τ (0.68, positively correlated at $P \leq 0.05$). The same seven taxa comprised over 90% of the samples taken during the day and at night. Species ranks were slightly different, since shorthead redhorse was the fifth most abundant species in day samples.

A linear relationship between 1982 day and night densities yielded a correlation coefficient (r) of 0.90. The 1982 density data were then used in the model to predict day densities based on observed night densities (Table 3.2-75). The resultant predictions for 18 day densities

were compared with observed day densities and plotted with the 90 and 95% confidence intervals in Figure 3.2-6. Only one point (5.6%) fell outside the 95% confidence interval and three (16.7%) were outside the 90% confidence interval. Chance alone would allow 5 to 10% of the points to fall outside these respective limits. Calculated residuals did not indicate any unusual pattern and most observed vs. predicted points fell within the expected limits. This indicated that the day/night density relationship in 1982 was not significantly different from that calculated for 1978 through 1980.

The ANCOVA on all day and night data indicated no significant difference in the slopes of the regression lines (1978 through 1982) ($P \leq 0.17$). Therefore, the day/night relationship in all years was similar.

3.2.8 DISCHARGE DENSITIES

Densities at Discharge Station 11A1 ranked sixth in overall abundance. SNK results showed that densities at Station 11A1 were not significantly different from five other stations (Table 3.2-74).

To monitor variations in Discharge densities, the 1980 Discharge regression equation was applied to predict 1982 Discharge densities (night data only); results are presented in Table 3.2-76 and Figure 3.2-7. The residuals indicated that actual densities at the Discharge were often higher than the model predicted; however, only two points fell outside the 95% confidence limits. The model still effectively predicts the densities that can be expected at the Discharge based on those collected

at Stations 13A2 and 16A1. The higher observed than predicted densities at the Discharge in 1982 may have resulted from the high river flow that either concentrated larvae at the Discharge or caused larvae along TMI to be less dispersed than in previous years. However, the close relationship of observed and predicted densities showed that Discharge densities were not significantly different from those of previous years.

3.2.9 SIMILARITY INDICES AND SPECIES DIVERSITY

Percent similarity indices among stations at night ranged from 13.01 (Stations 14B1 and 16A1) to 91.40 (Stations 13A2 and 11A1) (Table 3.2-77). Low PSc values, shown graphically in Figures 3.2-8 and 3.2-9, were mostly associated with Stations 14B1 and 4A1. Highest association (>80%) was among the west TMI stations, and between Stations 14B1, 10B1, 12B1, and 4A1 due to a high percentage of pumpkinseed/bluegill larvae. The high PSc values along TMI were attributed to the laminar flow along the island which carried larvae en masse through the sampling areas.

Species diversity at the 14 stations at night ranged from 1.01 (Station 14B1) to 2.91 (Station 15B1) (Table 3.2-56). At night, diversities over 2.0 occurred at all but three stations (Figure 3.2-10); by date, diversities over 2.0 occurred only from 25 May through 10 June and again on 6 July (Table 3.2-57 and Figure 3.2-11). Diversity indices for overall day and night catches were 2.07 and 2.49, respectively.

Diversity indices at three stations (14B1, 12B1, and 10B1) fell below their previous ranges (Figure 3.2-10). These stations were located in the west channel of York Haven Pond (Figure 3.1-1). The low indices were attributed to the overabundance of pumpkinseed/bluegill larvae coupled with the low numbers of other species taken.

3.2.10 ENVIRONMENTAL FACTORS RELATING TO ICHTHYOPLANKTON DENSITIES - 1982

Regression analysis for heating degree days (HDD in F) and cumulative river temperature (CRT in F) in 1982 explained 74% of the variation in ichthyoplankton densities ($r = 0.862$). The equation for 1982 data was:

$$\hat{Y} = -59.42 - CRT + 0.01(HDD)$$

where \hat{Y} = the estimated ichthyoplankton (log) density on any date. The coefficient of determination, r^2 , (0.74) was not as high as in most other years (Nardacci and Associates 1981, 1982) because day length, usually the most significant factor, did not enter into the 1982 equation.

For combined ichthyoplankton data 1977 through 1982, day length (DL in hours) and cumulative river temperature explained 70% of the variation in densities ($r = 0.834$). The resulting equation was:

$$\hat{Y} = -14.83 + 1.17(DL) + CRT.$$

3.3 DISCUSSION

Ichthyoplankton surveys and analyses were conducted similar to previous years to facilitate comparisons in abundance and distribution

of newly spawned fishes in York Haven Pond. Trends that occurred previously and were also evident in 1982 included:

1) Annual Seasonal Abundance:

Each year (1976 through 1981) the initial ichthyoplankton density peak occurred in spring just after water temperature reached 20 C (Table 3.3-1 and Figure 3.3-1). However, the initial peak in 1982 was not the highest observed; it was superseded by a larger peak in late July. In 1982 as in past years, densities were profoundly affected by changes in river flow and water temperature. River flow above 1,000 m³/s and water temperature below 20 C tended to decrease densities in all years.

Total and night abundances of larvae taken in 1982 were the lowest to date (Table 3.3-2). Day numbers were within the previous range. Since the 1982 density trends followed previous guidelines (peaks initiated by 20 C water temperature and moderated by high river flow), the lower numbers may be attributed to heavy late spring rains which lowered water temperature and increased river flow. NOAA reports verify that average temperature and rainfall were below and above normal means, respectively, in May and June.

2) Species Composition:

Overall species composition in 1982 was similar to previous years; the same seven taxa were most common and comprised over 94% of the total catch (common carp, spottail shiner, spotfin shiner, quillback, pumpkinseed/

bluegill, tessellated darter, and banded darter) (Table 3.3-2 and Figure 3.3-2). Relative abundance and ranks of these species varied somewhat each year depending upon spawning success (Figure 3.3-3).

Previous recorded maxima or minima were exceeded by three species in 1982. Quillback larval abundance was the lowest recorded (Table 3.3-2). Channel catfish young also were taken in record low numbers. A record high number was recorded for pumpkinseed/bluegill. This taxon may be increasing in certain areas of York Haven Pond (Figure 3.3-4). Electrofishing, seine, and trapnet data for these species suggest that catches have generally risen since 1976 (Nardacci and Associates 1977, 1978, 1979, 1980, 1981, 1982).

3) Spatial Distribution:

Stations 14B' and 4A1 were typically the most abundantly populated areas of York Haven Pond due principally to the high density of pumpkinseed/bluegill larvae taken each year in July. Station 10B2 and sometimes 9B1 yielded high densities, largely due to the abundance of common carp and/or spotfin shiner. Yearly density fluctuations at the various stations usually reflected the spawning success of one or two key species. Stations 15B1, 10B1, and 13A1 were typically low density stations each year due mainly to their lack of nearby suitable spawning habitat (paucity of shoreline or steeply cut banks). Density at the Discharge station (11A1) ranked between sixth and ninth each year.

Spatial distribution of the more common species in York Haven Pond generally followed similar trends each year (Figure 3.3-4). Common carp

were numerous at Stations 11B1, 4A1, along west TMI (16A1, 13A2, 11A1, and 9B1), and at south Shelley Island (10B2 and 10B3). The widespread abundance of common carp was probably a result of spawning success and drift. Spottail shiner were most common at Stations 14B1, 4A1, along west TMI, and 10B2. Spotfin shiner were abundant late in the season at the calm water stations (14B1, 12A1, 10B2, and 4A1). Both spottail shiner and spotfin shiner abundances probably resulted from larvae spawned directly in York Haven Pond rather than from drift. Quillback abundances were probably the result of drift and larvae were collected primarily at stations along west TMI and at Stations 4A1 and 12A1. Pumpkinseed/bluegill preferred the calm water areas of Stations 14B1 and 4A1. Stations downstream from these areas typically yielded pumpkinseed/bluegill larvae as drift. [During low river flow ($<175 \text{ m}^3/\text{s}$) the east channel backwater flows out past the north tip of TMI and consequently down the west shore of TMI]. The tessellated darter and banded darter varied greatly in abundance but seemed to prefer stations along west TMI, 14B1, 1B1, and 12A1.

4) Temporal Distribution:

Species abundance followed previously documented seasonal trends: typical spring spawners (common carp, spottail shiner, suckers, and perches) comprised the initial density peak. Early summer spawners included many centrarchids, some minnows, and catfishes. Late spawners (pumpkinseed/bluegill, spotfin shiner, and mimic shiner) typically

comprised the second density peak in July. In 1982, gizzard shad larvae appeared mainly in mid-May corresponding to the first 20 C water temperature; previously they had been associated with 25 C water temperature in York Haven Pond. However, the total gizzard shad catch was low and its preferred spawning temperature in York Haven Pond could not be determined. Jones et al. (1978) determined that gizzard shad spawn most actively at 18 to 19 C, usually as temperature rises. Hatching occurred from 36 hours to a week later, depending on temperature (Bodola 1966). Young channel catfish appeared in samples only after the river temperature reached 25 C, a phenomenon noted in past years. The low 1982 catfish abundance may have been caused by the unusual river flow and water temperature conditions, since they prefer temperatures of 21 to 29 C for spawning (Jones et al. 1978).

5) Diel Abundance:

The 1982 night samples contained 5.2 times more fish than day samples; this ratio falls within the previously established range (4.1 to 7.8). More species were found in 1982 night samples (31) than in day samples (27); both day and night catches for 1982 bettered the previous records (24 and 30, respectively) (Table 3.3-2). The fact that fish larvae are more commonly taken at night has been well established (Cada et al. 1980, Edwards et al. 1977, Lathrop 1982, Lewis and Siler 1980, Nardacci and Associates 1982, Van Den Avyle and Fox 1980).

The 1980 model to predict day densities was used successfully on 1982 data. An ANCOVA compared the slopes of the 1978 through 1982 regression lines and indicated that the yearly day and night density trends were not significantly different. If sampling were done during either phase (day or night), densities could be predicted for the other phase based on past and observed data and the linear relationship between them.

3.3.1 DISCHARGE MODEL

Use of the Discharge model permitted the monitoring of ichthyoplankton densities expected at the Discharge based on upstream densities. Approximately 80 to 90% of the densities can be predicted from the 1980 model. A change at the Discharge station, which may influence ichthyoplankton density above or below expected levels, could be detected by the model based upon densities in unaffected areas.

3.3.2 ENVIRONMENTAL FACTORS RELATED TO DENSITIES

Many environmental factors affect ichthyoplankton densities through modifications of spawning and hatching success. It is well known that spawning in fishes is related to day length and rising spring water temperature (Hynes 1970, Scott and Crossman 1973). Another important factor affecting densities in York Haven Pond is the seasonal spawning succession of the different species, which results in the yearly bimodal peaks in ichthyoplankton abundance. The magnitude of these peaks seems to be related to and modified by water temperature and river flow conditions in York Haven Pond. Water temperature of 20 C or more

appeared related to hatching success of most species. It is unclear why high river flow ($>1,000 \text{ m}^3/\text{s}$) and lower water temperature ($<20 \text{ C}$) are associated with lower density but the most probable causes include 1) disruption of spawning and hatching; 2) dislocation, siltation, abrasion, and/or thermal shock to eggs or larvae; and 3) displacement and dilution of larvae in the higher volume of water.

These observed influences (20 C water temperature and high river flow) have not related well to ichthyoplankton density fluctuations in the mathematical models tested. On the other hand, factors such as day length and temperature parameters that reflect the general warming trends have been mathematically related to density. Regressions involving day length, heating degree days, and cumulative river temperature have explained from 70 to 95% of the variability in densities. These trends may be even clearer if regressions are refined to a single species or to early or late spawning groups.

To date, any variations in York Haven Pond ichthyoplankton densities (seasonal abundance, composition, spatial, temporal, and diel distribution) were apparently most related to variations in preferred spawning conditions and environmental factors rather than to TMINS.

Table 3.1-1

Location and description of ichthyoplankton push net stations sampled in York Haven Pond in 1982.

Station Number	Location and Description
TM-LF-14B1*	40° 10' 12" N, 76° 45' 00" W beginning from a point 500 m downstream from the fall line riffles along the east shore of York Haven Pond. Water depth varied from 1.0 to 1.5 m. Substrate was mostly boulders, cobbles, pebbles, and some mud. Current velocities ⁺ were generally moderate to slow.
TM-LF-15B1	40° 10' 02" N, 76° 44' 14" W beginning from a point along the east shore of Hill Island about 500 m below the fall line riffles. Water depth varied from 1.0 to 1.5 m. Substrate was mostly boulders, cobbles, and pebbles. Current velocities were moderate.
TM-LF-1B1	40° 10' 11" N, 76° 43' 27" W beginning from a point upstream of the Tri County Marina along the east shore of York Haven Pond. Water depth varied from 1.0 to 2.0 m. Bottom was boulders, cobbles, and pebbles. Swift to moderate current velocities prevailed.
TM-LF-12B1	40° 08' 45" N, 76° 44' 46" W beginning from a point about 200 m below the mouth of Fishing Creek along the west shore of York Haven Pond. Water depth was about 1.0 m. Bottom was mostly mud with some pebbles and gravel. Current velocities were moderate.
TM-LF-12A1	40° 08' 57" N, 76° 44' 17" W beginning from a point on the west shore of Shelley Island opposite Station 12B1. Water depth varied from 1.0 to 1.5 m. Bottom was mostly mud with some pebbles and gravel. Current velocities were moderate.
TM-LF-13A1	40° 09' 16" N, 76° 43' 54" W beginning from a point along the east shore of Shelley Island opposite the TMINS Unit 1 Intake. Water depth varied from 1.5 to 2.0 m. Bottom was mostly mud. Current velocities were moderate.
TM-LF-13A2	40° 09' 16" N, 76° 43' 40" W beginning from a point upstream from the TMINS Unit 2 Intake to a point upstream of the Unit 1 Intake. Water depth varied from 2.0 to 3.0 m but up to 8.0 m directly in front of the Intake structure. Bottom type was mostly boulders and mud. Current was usually swift.
TM-LF-4A1	40° 09' 16" N, 76° 43' 17" W beginning at a point along the east shore of TMI opposite the TMINS Unit 2 Cooling Tower #3. Water depth varied from 1.0 to 1.5 m. Bottom was mud with some tree stumps. Current velocities were slow to none.
TM-LF-10B1	40° 08' 06" N, 76° 44' 30" W beginning on the east shore of Bashore Island downstream from the north tip. Water depth was about 1.0 m. Bottom was mostly mud with some cobbles. Current velocities were moderate.
TM-LF-10B2	40° 08' 02" N, 76° 43' 58" W beginning at the southwestern tip of Shelley Island. Water depth varied from 1.0 to 1.5 m. Bottom was mostly mud. Current velocities were moderate.
TM-LF-10B3	40° 08' 08" N, 76° 43' 56" W beginning at the southeastern tip of Shelley Island. Water depth varied from 1.0 to 1.5 m. Bottom type was mostly mud. Current velocities were mostly moderate to slow.
TM-LF-9B1	40° 08' 08" N, 76° 43' 35" W beginning at a point 200 m upstream from the York Haven Dam along the southwestern shore of TMI. Water depth was about 1.0 m. Bottom type was mostly mud. Current velocities were moderate.
TM-LF-11A1	40° 09' 04" N, 76° 43' 39" W beginning at a point 200 m downstream from the TMINS Discharge. Water depth was about 1.0 m. Bottom was mostly mud. Current velocities were moderate to slow.
TM-LF-16A1	40° 09' 19" N, 76° 43' 38" W beginning at a point 500 m downstream from the north tip of TMI along the west shore. Water depth varied from about 1.0 to 1.5 m. Bottom type was mostly boulders, cobbles, pebbles, and some mud. Current velocities were swift to moderate.

Prefix TM-LF* deleted for discussion in text.

+ Surface current velocities were defined as slow (< 15 cm/sec), moderate (16 to 40 cm/sec), and swift (> 40 cm/sec) at summer river flows $\leq 566 \text{ m}^3/\text{s}$ (20,000 cfs).

Table 3.1-2

List of scientific and common names of ichthyoplankton taken by push net in York Haven Pond in 1982.

Scientific Name	Common Name
<u>Clupeidae</u>	Herrings
<u>Dorosoma cepedianum</u> (Lesueur)	Gizzard shad
<u>Cyprinidae</u>	Carp and Minnows
<u>Campostoma anomalum</u> (Rafinesque)	Central stoneroller
<u>Cyprinus carpio</u> Linnaeus	Common carp
<u>Notemigonus crysoleucas</u> (Mitchill)	Golden shiner
<u>Notropis amoenus</u> (Abbott)	Comely shiner
<u>Notropis hudsonius</u> (Clinton)	Spottail shiner
<u>Notropis procne</u> (Cope)	Swallowtail shiner
<u>Notropis spilopterus</u> (Cope)	Spotfin shiner
<u>Notropis volucellus</u> (Cope)	Mimic shiner
<u>Pimephales notatus</u> (Rafinesque)	Bluntnose minnow
<u>Rhinichthys atratulus</u> (Hermann)	Blacknose dace
<u>Rhinichthys cataractae</u> (Valenciennes)	Longnose dace
<u>Semotilus atromaculatus</u> (Mitchill)	Creek chub
<u>Semotilus corporalis</u> (Mitchill)	Fallfish
<u>Catostomidae</u>	Suckers
<u>Carpionodes cyprinus</u> (Lesueur)	Quillback
<u>Catostomus commersoni</u> (Lacepède)	White sucker
<u>Hypentelium nigricans</u> (Lesueur)	Northern hog sucker
<u>Moxostoma macrolepidotum</u> (Lesueur)	Shinerhead redhorse
<u>Ictaluridae</u>	Bullhead catfishes
<u>Ictalurus natalis</u> (Lesueur)	Yellow bullhead
<u>Ictalurus punctatus</u> (Rafinesque)	Channel catfish
<u>Centrarchidae</u>	Sunfishes
<u>Ambloplites rupestris</u> (Rafinesque)	Rock bass
<u>Lepomis auritus</u> (Linnaeus)	Redbreast sunfish
<u>Lepomis gibbosus</u> (Linnaeus)	Pumpkinseed
<u>Lepomis macrochirus</u> Rafinesque	Bluegill
<u>Micropterus dolomieu</u> Lacepède	Smallmouth bass
<u>Micropterus salmoides</u> (Lacepède)	Largemouth bass
<u>Pomoxis annularis</u> Rafinesque	White crappie
<u>Pomoxis nigromaculatus</u> (Lesueur)	Black crappie
<u>Percidae</u>	Perches
<u>Etheostoma olmstedi</u> Storer	Tessellated darter
<u>Etheostoma zonale</u> (Cope)	Banded darter
<u>Perca flavescens</u> (Mitchill)	Yellow perch
<u>Percina peltata</u> (Stauffer)	Shiner darter
<u>Stizostedion vitreum vitreum</u> (Mitchill)	Walleye

TABLE 3.2-2 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 13 APRIL 1982.

RIVER FLOW (M ³ /SEC)		162							
STATION		TM-LF-1081		TM-LF-1091		TM-LF-1093		TM-LF-1091	
TIME (EST)		213	213	213	213	213	213	213	213
CURRENT VELOCITY (CM/SEC)		NA	NA	NA	NA	NA	NA	NA	NA
AIR TEMP (C)		11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
WATER TEMP (C)		11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
DISSOLVED OXYGEN (PPM)		11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
PH		8.9	8.9	8.9	8.9	8.9	8.9	8.9	8.9
REPLICATE									
VOLUME SAMPLED (M ³)		33.19	33.19	38.22	38.22	34.50	34.50	33.82	33.82
DENSITY		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN DENSITY									
TAXA									
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0	0

TABLE 3.2-2 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 13 APRIL 1982.

RIVER FLOW (M ³ /SEC)		162			
STATION		TM-LF-11A1		TM-LF-16A1	
TIME (EST)		2039	2039	2002	2002
CURRENT VELOCITY (CM/SEC)		NA	NA	NA	NA
AIR TEMP (C)		12.0	12.0	12.0	12.0
WATER TEMP (C)		12.0	12.0	12.0	12.0
DISSOLVED OXYGEN (PPM)		11.0	11.0	11.0	11.0
PH		8.9	8.9	8.9	8.9
REPLICATE					
VOLUME SAMPLED (M ³)		31.73	30.45	34.11	33.81
DENSITY		0.00	0.00	0.00	0.00
MEAN DENSITY					
TAXA					
		N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE					
TOTAL LARVAE		0	0	0	0
YOUNG					
TOTAL YOUNG		0	0	0	0
TOTAL		0	0	0	0

TABLE 3.2-3

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 21 APRIL 1982.

RIVER FLOW (M ³ /SEC)		1903							
STATION		TM-LF-1481		TM-LF-1581		TM-LF-161		TM-LF-1281	
TIME (EST)		1214	1214	1154	1154	0926	0926	1227	1227
CURRENT VELOCITY (CM/SEC)		33	33	36.0	36.0	18.0	18.0	35	35
AIR TEMP (C)		16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
WATER TEMP (C)		16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
DISSOLVED OXYGEN (PPM)		9.0	9.0	9.0	9.0	8.0	8.0	10.0	10.0
PH		7.9	7.9	7.9	7.9	8.0	8.0	8.0	8.0
SECCHI (CM)		97	97	61	61	100	100	97	97
REPLICATE									
VOLUME SAMPLED (M ³)		35.83	36.70	31.83	33.04	37.83	38.74	38.11	37.50
DENSITY		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN DENSITY									
TAXA									
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0	0

NA Not Available.

TABLE 3.2-3 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 21 APRIL 1982.

RIVER FLOW (M ³ /SEC)		1903							
STATION		TM-LF-10A1		TM-LF-10A1		TM-LF-10A2		TM-LF-10A1	
TIME (EST)		1123		1019		0930		1009	
CURRENT VELOCITY (CM/SEC)		NA		5.8		5.8		NA	
AIR TEMP (C)		14.0		14.0		14.0		14.0	
WATER TEMP (C)		14.0		14.0		14.0		14.0	
DISSOLVED OXYGEN (PPM)		11.0		11.0		11.0		11.0	
PH		7.7		7.7		7.7		7.7	
SECCHI (CM)		15		15		15		15	
REPLICATE		A B		A B		A B		A B	
VOLUME SAMPLED (M ³)		31.98	32.17	34.67	35.61	37.71	38.20	34.51	35.65
DENSITY		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		0		0		0		0	
TOTAL LARVAE		0	0.00	0	0.00	0	0.00	0	0.00
YOUNG		0		0		0		0	
TOTAL YOUNG		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL		0	0	0	0	0	0	0	0

TABLE 3.2-3 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 21 APRIL 1982.

RIVER FLOW (M ³ /SEC)		1903							
STATION		TM-LF-10B1		TM-LF-10B2		TM-LF-10B3		TM-LF-9B1	
TIME (EST)		1258		1105		1041		1053	
CURRENT VELOCITY (CM/SEC)		4.7		NA		4.4		NA	
AIR TEMP (C)		15.0		14.0		14.0		15.0	
WATER TEMP (C)		14.0		13.0		13.0		13.0	
DISSOLVED OXYGEN (PPM)		9.0		8.0		9.0		10.0	
PH		7.7		7.7		7.7		7.7	
SECCHI (CM)		15		15		15		15	
REPLICATE		A B		A B		A B		A B	
VOLUME SAMPLED (M ³)		33.95	35.35	33.50	32.81	35.52	37	33.15	33.49
DENSITY		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		0		0		0		0	
TOTAL LARVAE		0	0.00	0	0.00	0	0.00	0	0.00
YOUNG		0		0		0		0	
TOTAL YOUNG		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL		0	0	0	0	0	0	0	0

TABLE 3.2-3 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 21 APRIL 1982.

RIVER FLOW (M ³ /SEC)		1903			
STATION		TM-LF-10A1		TM-LF-10A1	
TIME (EST)		1028		1036	
CURRENT VELOCITY (CM/SEC)		6.5		6.5	
AIR TEMP (C)		14.0		14.0	
WATER TEMP (C)		14.0		14.0	
DISSOLVED OXYGEN (PPM)		10.0		10.0	
PH		7.7		7.7	
SECCHI (CM)		15		15	
REPLICATE		A B		A B	
VOLUME SAMPLED (M ³)		37.26	37.49	36.19	36.19
DENSITY		0.00	0.00	0.00	0.00
MEAN DENSITY		N DENSITY		N DENSITY	
TAXA		N DENSITY		N DENSITY	
LARVAE		0		0	
TOTAL LARVAE		0	0.00	0	0.00
YOUNG		0		0	
TOTAL YOUNG		0	0.00	0	0.00
TOTAL		0	0	0	0

TABLE 3.2-5 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 27 APRIL 1982.

RIVER FLOW (M ³ /SEC)													
943													
STATION													
TH-LF-10B1													
TH-LF-10B2													
TH-LF-10B3													
TH-LF-9B1													
TIME (DST)	1041			1018			1038			1029			
CURRENT VELOCITY (CM/SEC)	7.1			1.8			1.8			1.5			
AIR TEMP (C)	16.5			16.0			16.0			16.0			
WATER TEMP (C)	14.5			14.0			14.0			14.0			
DISSOLVED OXYGEN (PPM)	9.1			8.0			8.0			8.5			
PH	9.1			8.7			8.0			8.5			
SECCHI (CM)	134			102			80			71			
REPLICATE	A			B			A			B			
VOLUME SAMPLED (M ³)	47.44			49.87			36.94			37.54			
DENSITY	0.00			0.00			0.00			0.00			
MEAN DENSITY	0.00			0.00			0.00			0.00			
TAXA	N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY		
LARVAE													
TOTAL LARVAE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	
YOUNG													
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	
TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	

TABLE 3.2-5 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 27 APRIL 1982.

RIVER FLOW (M ³ /SEC)									
943									
STATION									
TH-LF-11A1									
TH-LF-16A1									
TIME (DST)	1122			1135			1135		
CURRENT VELOCITY (CM/SEC)	1.0			1.0			1.0		
AIR TEMP (C)	16.0			16.0			16.0		
WATER TEMP (C)	14.0			14.0			14.0		
DISSOLVED OXYGEN (PPM)	8.0			8.0			8.0		
PH	8.0			8.0			8.0		
SECCHI (CM)	60			60			60		
REPLICATE	A		B		A		B		
VOLUME SAMPLED (M ³)	35.05		35.51		34.98		35.10		
DENSITY	0.00		0.00		0.00		0.00		
MEAN DENSITY	0.00		0.00		0.00		0.00		
TAXA	N DENSITY		N DENSITY		N DENSITY		N DENSITY		
LARVAE									
TOTAL LARVAE	0	0.00	0	0.00	0	0.00	0	0.00	
YOUNG									
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	
TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	

TABLE 3.2-6

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 27 APRIL 1982.

RIVER FLOW (M ³ /SEC)													
943													
STATION													
TH-LF-12B1													
TH-LF-15B1													
TH-LF-18B1													
TH-LF-12B1													
TIME (DST)	2323			2308			2303			2058			
CURRENT VELOCITY (CM/SEC)	18.0			4.5			2.0			1.0			
AIR TEMP (C)	10.0			10.0			10.0			10.5			
WATER TEMP (C)	10.0			10.0			10.0			10.0			
DISSOLVED OXYGEN (PPM)	8.0			8.0			8.0			8.0			
PH	8.0			8.0			8.0			8.0			
SECCHI (CM)	NA			NA			NA			NA			
REPLICATE	A		B		A		B		A		B		
VOLUME SAMPLED (M ³)	31.02		31.08		33.42		32.62		32.45		33.33		
DENSITY	0.00		0.00		0.00		0.00		0.00		0.00		
MEAN DENSITY	0.00		0.00		0.00		0.00		0.00		0.00		
TAXA	N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY		
LARVAE													
PERCINA PELTATA	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	
STIZOSTEDION V. VITREUM	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	
TOTAL LARVAE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	
YOUNG													
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	
TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	

NA Not Available.

TABLE 3.2-6 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 27 APRIL 1962.

RIVER FLOW (M ³ /SEC)		941							
STATION		TM-LF-1241		TM-LF-1341		TM-LF-1342		TM-LF-1441	
TIME (DST)		2210		2210		2210		2210	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		11.4		11.4		11.4		11.4	
WATER TEMP (C)		11.4		11.4		11.4		11.4	
DISSOLVED OXYGEN (PPM)		8.8		8.8		8.8		8.8	
PM		A		B		A		B	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		31.00		31.90		34.51		35.84	
DENSITY		0.00		0.00		0.00		0.00	
MEAN DENSITY		0.00		0.00		0.00		0.00	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		0.00		0.00		0.00		0.00	
MERCINIA PELTATA		0.00		0.00		0.00		0.00	
STIZOSTEDION V. VITREUM		0.00		0.00		0.00		0.00	
TOTAL LARVAE		0.00		0.00		0.00		0.00	
YOUNG		0.00		0.00		0.00		0.00	
TOTAL YOUNG		0.00		0.00		0.00		0.00	
TOTAL		0.00		0.00		0.00		0.00	

TABLE 3.2-6 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 27 APRIL 1962.

RIVER FLOW (M ³ /SEC)		941							
STATION		TM-LF-1081		TM-LF-1082		TM-LF-1083		TM-LF-081	
TIME (DST)		2110		2110		2110		2110	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		11.5		11.5		11.5		11.5	
WATER TEMP (C)		11.5		11.5		11.5		11.5	
DISSOLVED OXYGEN (PPM)		8.8		8.8		8.8		8.8	
PM		A		B		A		B	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		34.69		35.37		33.71		34.10	
DENSITY		0.00		0.00		0.00		0.00	
MEAN DENSITY		0.00		0.00		0.00		0.00	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		0.00		0.00		0.00		0.00	
MERCINIA PELTATA		0.00		0.00		0.00		0.00	
STIZOSTEDION V. VITREUM		0.00		0.00		0.00		0.00	
TOTAL LARVAE		0.00		0.00		0.00		0.00	
YOUNG		0.00		0.00		0.00		0.00	
TOTAL YOUNG		0.00		0.00		0.00		0.00	
TOTAL		0.00		0.00		0.00		0.00	

TABLE 3.2-6 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 27 APRIL 1962.

RIVER FLOW (M ³ /SEC)		941			
STATION		TM-LF-1141		TM-LF-1641	
TIME (DST)		2110		2227	
CURRENT VELOCITY (CM/SEC)		0.00		0.00	
AIR TEMP (C)		10.5		10.5	
WATER TEMP (C)		10.5		10.5	
DISSOLVED OXYGEN (PPM)		8.4		8.4	
PM		A		B	
REPLICATE		A		B	
VOLUME SAMPLED (M ³)		35.90		34.90	
DENSITY		0.00		0.00	
MEAN DENSITY		0.00		0.00	
TAXA		N DENSITY		N DENSITY	
LARVAE		0.00		0.00	
MERCINIA PELTATA		0.00		0.00	
STIZOSTEDION V. VITREUM		0.00		0.00	
TOTAL LARVAE		0.00		0.00	
YOUNG		0.00		0.00	
TOTAL YOUNG		0.00		0.00	
TOTAL		0.00		0.00	

TABLE 3.2-7 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 4 MAY 1982.

RIVER FLOW (M ³ /SEC)		634			
STATION		TM-LF-11A1		TM-LF-16A1	
TIME (GST)		10:49	10:59	10:59	11:09
CURRENT VELOCITY (CM/SEC)		1.0	1.0	1.0	1.0
AIR TEMP (C)		17.5	17.5	17.5	17.5
WATER TEMP (C)		17.0	17.0	17.0	17.0
DISSOLVED OXYGEN (PPM)		8.1	8.1	8.1	8.1
PH		7.6	7.6	7.6	7.6
REPLICATE					
VOLUME SAMPLED (M ³)		30.32	30.17	30.13	30.19
DENSITY		0.00	3.31	0.00	0.00
MEAN DENSITY					
TAXA		N DENSITY		N DENSITY	
LARVAE					
PENCINA PELTATA		0	0	0	0
STIZOSTEDION V. VITREUM		0	3.31	0	0
TOTAL LARVAE		0	3.31	0	0
YOUNG					
TOTAL YOUNG		0	0	0	0
TOTAL		0	1	0	0

TABLE 3.2-8

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 4 MAY 1982.

RIVER FLOW (M ³ /SEC)		634							
STATION		TM-LF-14B1		TM-LF-15B1		TM-LF-16B1		TM-LF-12B1	
TIME (GST)		20:30	20:39	20:45	20:55	20:55	21:05	21:05	21:15
CURRENT VELOCITY (CM/SEC)		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
AIR TEMP (C)		16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
WATER TEMP (C)		12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
DISSOLVED OXYGEN (PPM)		8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
PH									
REPLICATE									
VOLUME SAMPLED (M ³)		32.00	32.00	32.00	32.00	24.88	24.95	33.09	33.18
DENSITY		19.95	19.95	3.05	3.05	8.04	8.04	0.00	0.00
MEAN DENSITY									
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
NOTROPIS HUDSONIUS		0	0	0	0	0	0	0	0
CATOSTOMUS COMMERSONI		0	0	0	0	0	0	0	0
ETHEOSTOMA OLMSTEDI		0	0	0	0	0	0	0	0
PENCINA PELTATA		0	0	0	0	0	0	0	0
STIZOSTEDION V. VITREUM		15	8	0	0	0	0	0	0
TOTAL LARVAE		15	8	0	0	0	0	0	0
YOUNG									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		5	8	1	0	2	5	0	0

TABLE 3.2-8 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 4 MAY 1982.

RIVER FLOW (M ³ /SEC)		634							
STATION		TM-LF-12A1		TM-LF-13A1		TM-LF-13A2		TM-LF-14A1	
TIME (GST)		21:10	21:10	20:54	20:54	21:07	21:07	21:10	21:10
CURRENT VELOCITY (CM/SEC)		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
AIR TEMP (C)		16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
WATER TEMP (C)		10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
DISSOLVED OXYGEN (PPM)		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
PH									
REPLICATE									
VOLUME SAMPLED (M ³)		34.01	34.89	33.98	34.74	31.78	32.09	33.86	34.32
DENSITY		0.78	2.87	0.00	0.00	1.15	6.23	0.00	0.00
MEAN DENSITY									
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
NOTROPIS HUDSONIUS		1	0	0	0	0	0	0	0
CATOSTOMUS COMMERSONI		0	0	0	0	0	0	0	0
ETHEOSTOMA OLMSTEDI		0	0	0	0	0	0	0	0
PENCINA PELTATA		0	0	0	0	0	0	0	0
STIZOSTEDION V. VITREUM		0	2	0	0	1	2	1	0
TOTAL LARVAE		1	2	0	0	1	2	1	0
YOUNG									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		2	1	0	0	1	2	1	0

TABLE 3.2-8 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 4 MAY 1982.

RIVER FLOW (M ³ /SEC)												
634												
STATION												
TH-LF-10B1												
TH-LF-10B2												
TH-LF-10B3												
TH-LF-10B1												
TIME (DST)												
2245												
CURRENT VELOCITY (CM/SEC)												
2.6												
AIR TEMP (C)												
12.7												
WATER TEMP (C)												
12.7												
DISSOLVED OXYGEN (PPM)												
8.0												
PH												
8.0												
REPLICATE												
A B A B A B A B												
VOLUME SAMPLED (M ³)												
35.11 35.98 32.14 32.74 35.31 36.00 35.54 36.72												
DENSITY												
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00												
MEAN DENSITY												
TAXA N DENSITY N DENSITY N DENSITY N DENSITY N DENSITY N DENSITY N DENSITY N DENSITY												
LARVAE												
NOTROPIS HUDSONIUS												
CATOSTOMUS COMMERSONI												
ETHEOSTOMA OLKSTEDI												
PERCINA PELTATA												
STILOGOSTEDION V. VITREUM												
TOTAL LARVAE												
YOUNG												
TOTAL YOUNG												
TOTAL												

TABLE 3.2-8 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 4 MAY 1982.

RIVER FLOW (M ³ /SEC)						
634						
STATION						
TH-LF-11A1						
TH-LF-16A1						
TIME (DST)						
2150						
CURRENT VELOCITY (CM/SEC)						
1.4						
AIR TEMP (C)						
17.0						
WATER TEMP (C)						
17.0						
DISSOLVED OXYGEN (PPM)						
10.0						
PH						
8.0						
REPLICATE						
A B A B						
VOLUME SAMPLED (M ³)						
36.78 36.88 32.51 32.71						
DENSITY						
0.84 0.00 0.00 0.00						
MEAN DENSITY						
TAXA N DENSITY N DENSITY N DENSITY N DENSITY						
LARVAE						
NOTROPIS HUDSONIUS						
CATOSTOMUS COMMERSONI						
ETHEOSTOMA OLKSTEDI						
PERCINA PELTATA						
STILOGOSTEDION V. VITREUM						
TOTAL LARVAE						
YOUNG						
TOTAL YOUNG						
TOTAL						

TABLE 3.2-9

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 11 MAY 1982.

RIVER FLOW (M ³ /SEC)												
493												
STATION												
TH-LF-14B1												
TH-LF-15B1												
TH-LF-18B1												
TH-LF-12B1												
TIME (DST)												
1157												
CURRENT VELOCITY (CM/SEC)												
3.5												
AIR TEMP (C)												
16.0												
WATER TEMP (C)												
16.0												
DISSOLVED OXYGEN (PPM)												
8.0												
PH												
7.6												
REPLICATE												
A B A B A B A B												
VOLUME SAMPLED (M ³)												
25.94 25.90 29.00 28.88 31.61 31.86 31.23 31.31												
DENSITY												
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00												
MEAN DENSITY												
TAXA N DENSITY N DENSITY N DENSITY N DENSITY N DENSITY N DENSITY N DENSITY												
LARVAE												
NOTROPIS HUDSONIUS												
CARPILIDES CYPRINUS												
MOYOSTOMA MACROLEPIDOTUM												
PERCINA PELTATA												
STILOGOSTEDION V. VITREUM												
TOTAL LARVAE												
YOUNG												
TOTAL YOUNG												
TOTAL												

TABLE 3.2-9 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 11 MAY 1982.

RIVER FLOW (M ³ /SEC)												
493												
STATION												
TM-LF-12A1												
TIME (DST)												
CURRENT VELOCITY (CM/SEC)												
AIR TEMP (C)												
WATER TEMP (C)												
DISSOLVED OXYGEN (PPM)												
PH												
SECCHI (CM)												
REPLICATE												
VOLUME SAMPLED (M ³)												
DENSITY												
MEAN DENSITY												
TAXA												
N DENSITY												
N DENSITY												
LARVAE												
NOTROPIS HUDSONIUS												
CARPIONUS CYPRINUS												
MOROSTOMA MACROLEPIDOTUM												
PERCINA PELTATA												
STIZOSTEDION V. VITREUM												
TOTAL LARVAE												
YOUNG												
TOTAL YOUNG												
TOTAL												

TABLE 3.2-9 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 11 MAY 1982.

RIVER FLOW (M ³ /SEC)												
493												
STATION												
TM-LF-10B1												
TIME (DST)												
CURRENT VELOCITY (CM/SEC)												
AIR TEMP (C)												
WATER TEMP (C)												
DISSOLVED OXYGEN (PPM)												
PH												
SECCHI (CM)												
REPLICATE												
VOLUME SAMPLED (M ³)												
DENSITY												
MEAN DENSITY												
TAXA												
N DENSITY												
N DENSITY												
LARVAE												
NOTROPIS HUDSONIUS												
CARPIONUS CYPRINUS												
MOROSTOMA MACROLEPIDOTUM												
PERCINA PELTATA												
STIZOSTEDION V. VITREUM												
TOTAL LARVAE												
YOUNG												
TOTAL YOUNG												
TOTAL												

TABLE 3.2-9 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 11 MAY 1982.

RIVER FLOW (M ³ /SEC)												
493												
STATION												
TM-LF-11A1												
TIME (DST)												
CURRENT VELOCITY (CM/SEC)												
AIR TEMP (C)												
WATER TEMP (C)												
DISSOLVED OXYGEN (PPM)												
PH												
SECCHI (CM)												
REPLICATE												
VOLUME SAMPLED (M ³)												
DENSITY												
MEAN DENSITY												
TAXA												
N DENSITY												
N DENSITY												
LARVAE												
NOTROPIS HUDSONIUS												
CARPIONUS CYPRINUS												
MOROSTOMA MACROLEPIDOTUM												
PERCINA PELTATA												
STIZOSTEDION V. VITREUM												
TOTAL LARVAE												
YOUNG												
TOTAL YOUNG												
TOTAL												

TABLE 3.2-10 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 11 MAY 1982.

RIVER FLOW (M ³ /SEC)		493			
STATION		TM-LF-11A1		TM-LF-11A1	
TIME (DST)		22:00		22:00	
CURRENT VELOCITY (CM/SEC)		16.00		16.00	
AIR TEMP (C)		18.00		18.00	
WATER TEMP (C)		18.00		18.00	
DISSOLVED OXYGEN (PPM)		8.7		8.7	
PH		8.7		8.7	
SECCHI (CM)		107		107	
REPLICATE		A B		A B	
VOLUME SAMPLED (M ³)		36.85		36.85	
DENSITY		120.98		120.98	
MEAN DENSITY		150.78		111.20	
TAXA		N DENSITY		N DENSITY	
LARVAE					
CYPRINUS CARPIO	0	0.00	0	0	0.00
NOTROPIS HUDSONIUS	10	0.27	5	0	0.00
PERCINA PELTATA	1	0.03	1	0	0.00
CARP IOIDES CYPRINUS	1	0.03	1	0	0.00
ETHEOSTOMA OLIMSTEDI	1	0.03	1	0	0.00
ETHEOSTOMA ZONALE	1	0.03	1	0	0.00
PERCINA PELTATA	1	0.03	1	0	0.00
STIZOSTEDION V. VITREUM	1	0.03	1	0	0.00
TOTAL LARVAE	16	0.43	10	0	0.00
YOUNG					
TOTAL YOUNG	0	0.00	0	0	0.00
TOTAL	16	0.43	10	0	0.00

TABLE 3.2-11

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 18 MAY 1982.

RIVER FLOW (M ³ /SEC)		405							
STATION		TM-LF-19B1		TM-LF-15B1		TM-LF-15B1		TM-LF-12B1	
TIME (DST)		09:00		10:00		10:00		09:00	
CURRENT VELOCITY (CM/SEC)		18.00		18.00		18.00		18.00	
AIR TEMP (C)		18.00		18.00		18.00		18.00	
WATER TEMP (C)		18.00		18.00		18.00		18.00	
DISSOLVED OXYGEN (PPM)		8.1		8.1		8.1		8.1	
PH		8.1		8.1		8.1		8.1	
SECCHI (CM)		107		107		107		107	
REPLICATE		A B		A B		A B		A B	
VOLUME SAMPLED (M ³)		35.18		35.18		35.07		35.07	
DENSITY		120.98		120.98		120.98		120.98	
MEAN DENSITY		5.98		1.41		54.17		62.99	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
ODONOSOMA CEPEDIANUM	0	0.00	0	0	0.00	0	0.00	0	0.00
CYPRINUS CARPIO	0	0.00	0	0	0.00	0	0.00	0	0.00
NOTROPIS HUDSONIUS	0	0.00	0	0	0.00	0	0.00	0	0.00
CARP IOIDES CYPRINUS	0	0.00	0	0	0.00	0	0.00	0	0.00
ETHEOSTOMA OLIMSTEDI	0	0.00	0	0	0.00	0	0.00	0	0.00
ETHEOSTOMA ZONALE	0	0.00	0	0	0.00	0	0.00	0	0.00
PERCINA PELTATA	1	0.03	1	0	0.00	5	0.14	5	0.14
TOTAL LARVAE	1	0.03	1	0	0.00	5	0.14	5	0.14
YOUNG									
TOTAL YOUNG	0	0.00	0	0	0.00	0	0.00	0	0.00
TOTAL	1	0.03	1	0	0.00	5	0.14	5	0.14

TABLE 3.2-11 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 18 MAY 1982.

RIVER FLOW (M ³ /SEC)		405							
STATION		TM-LF-12A1		TM-LF-13A1		TM-LF-13A2		TM-LF-18A1	
TIME (DST)		10:00		11:00		11:00		11:00	
CURRENT VELOCITY (CM/SEC)		18.00		18.00		18.00		18.00	
AIR TEMP (C)		18.00		18.00		18.00		18.00	
WATER TEMP (C)		18.00		18.00		18.00		18.00	
DISSOLVED OXYGEN (PPM)		8.1		8.1		8.1		8.1	
PH		8.1		8.1		8.1		8.1	
SECCHI (CM)		107		107		107		107	
REPLICATE		A B		A B		A B		A B	
VOLUME SAMPLED (M ³)		32.13		32.13		32.13		32.13	
DENSITY		120.98		120.98		120.98		120.98	
MEAN DENSITY		3.11		5.90		11.17		23.37	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
ODONOSOMA CEPEDIANUM	0	0.00	0	0	0.00	0	0.00	0	0.00
CYPRINUS CARPIO	0	0.00	0	0	0.00	0	0.00	0	0.00
NOTROPIS HUDSONIUS	0	0.00	0	0	0.00	0	0.00	0	0.00
CARP IOIDES CYPRINUS	0	0.00	0	0	0.00	0	0.00	0	0.00
ETHEOSTOMA OLIMSTEDI	0	0.00	0	0	0.00	0	0.00	0	0.00
ETHEOSTOMA ZONALE	0	0.00	0	0	0.00	0	0.00	0	0.00
PERCINA PELTATA	1	0.03	1	0	0.00	10	0.31	11	0.34
TOTAL LARVAE	1	0.03	1	0	0.00	10	0.31	11	0.34
YOUNG									
TOTAL YOUNG	0	0.00	0	0	0.00	0	0.00	0	0.00
TOTAL	1	0.03	1	0	0.00	10	0.31	11	0.34

TABLE 3.2-11 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 18 MAY 1982.

RIVER FLOW (M ³ /SEC)		NDS							
STATION		TM-LF-10B1		TM-LF-10B2		TM-LF-10B3		TM-LF-10B1	
TIME (DST)	CURRENT VELOCITY (CM/SEC)	A		B		A		B	
09:15	0.0	33.71		33.71		36.04		36.77	
AIR TEMP (C)	18.5	0.00		5.93		5.55		0.00	
WATER TEMP (C)	18.5	0.00		0.00		0.00		0.00	
DISSOLVED OXYGEN (PPM)	8.4	0.00		0.00		0.00		0.00	
PH	8.1	0.00		0.00		0.00		0.00	
SECCHI (CM)	9.7	0.00		0.00		0.00		0.00	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		33.71		33.71		36.04		36.77	
DENSITY	0.00	0.00		0.00		0.00		0.00	
MEAN DENSITY		2.97		2.77		0.00		31.63	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		0		0		0		0	
DOROSOMA CEPEDIANUM		0		0		0		0	
CYPRINUS CARPIO		0		0		0		0	
NOTROPIS HUDSONIUS		0		0		0		0	
CARPIONUS CYPRINUS		0		0		0		0	
ETHIOSTOMA OLMSTEDI		0		0		0		0	
ETHIOSTOMA ZONALE		0		0		0		0	
PERCINA PELTATA		0		0		0		0	
PERCINA PELTATA		0		0		0		0	
TOTAL LARVAE		0		0		0		0	
YOUNG		0		0		0		0	
TOTAL YOUNG		0		0		0		0	
TOTAL		0		0		0		0	

TABLE 3.2-11 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 18 MAY 1982.

RIVER FLOW (M ³ /SEC)		NDS			
STATION		TM-LF-11A1		TM-LF-16A1	
TIME (DST)	CURRENT VELOCITY (CM/SEC)	A		B	
10:00	0.0	41.70		41.70	
AIR TEMP (C)	18.5	7.19		16.79	
WATER TEMP (C)	18.5	0.00		0.00	
DISSOLVED OXYGEN (PPM)	8.4	0.00		0.00	
PH	8.1	0.00		0.00	
SECCHI (CM)	9.7	0.00		0.00	
REPLICATE		A <td colspan="2">B</td>		B	
VOLUME SAMPLED (M ³)		41.70		41.70	
DENSITY	0.00	0.00		0.00	
MEAN DENSITY		11.90		5.38	
TAXA		N DENSITY		N DENSITY	
LARVAE		0		0	
DOROSOMA CEPEDIANUM		0		0	
CYPRINUS CARPIO		0		0	
NOTROPIS HUDSONIUS		0		0	
CARPIONUS CYPRINUS		0		0	
ETHIOSTOMA OLMSTEDI		0		0	
ETHIOSTOMA ZONALE		0		0	
PERCINA PELTATA		0		0	
PERCINA PELTATA		0		0	
TOTAL LARVAE		0		0	
YOUNG		0		0	
TOTAL YOUNG		0		0	
TOTAL		0		0	

TABLE 3.2-12

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 18 MAY 1982.

RIVER FLOW (M ³ /SEC)		NDS							
STATION		TM-LF-14B1		TM-LF-15B1		TM-LF-16B1		TM-LF-12B1	
TIME (DST)	CURRENT VELOCITY (CM/SEC)	A		B		A		B	
20:00	0.0	35.47		32.80		36.04		37.00	
AIR TEMP (C)	18.5	45.46		40.09		33.30		32.87	
WATER TEMP (C)	18.5	0.00		0.00		0.00		0.00	
DISSOLVED OXYGEN (PPM)	8.4	0.00		0.00		0.00		0.00	
PH	8.1	0.00		0.00		0.00		0.00	
SECCHI (CM)	9.7	0.00		0.00		0.00		0.00	
REPLICATE		A <td colspan="2">B</td> <td colspan="2">A <td colspan="2">B</td> </td>		B		A <td colspan="2">B</td>		B	
VOLUME SAMPLED (M ³)		35.47		32.80		36.04		37.00	
DENSITY	0.00	0.00		0.00		0.00		0.00	
MEAN DENSITY		45.46		40.09		1.08		41.92	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		0		0		0		0	
DOROSOMA CEPEDIANUM		0		0		0		0	
CYPRINUS CARPIO		0		0		0		0	
NOTROPIS HUDSONIUS		0		0		0		0	
SMINTHUS ATRATUS		0		0		0		0	
SEMOTILUS CORPORALIS		0		0		0		0	
CARPIONUS CYPRINUS		0		0		0		0	
CAROTIDUS COMMERSONI		0		0		0		0	
HYPERENTILUM NIGRICANS		0		0		0		0	
ETHIOSTOMA OLMSTEDI		0		0		0		0	
ETHIOSTOMA ZONALE		0		0		0		0	
PERCINA PELTATA		0		0		0		0	
PERCINA PELTATA		0		0		0		0	
STILOSTEDION VITREUM		0		0		0		0	
TOTAL LARVAE		0		0		0		0	
YOUNG		0		0		0		0	
NOTROPIS SPILOPTERUS		0		0		0		0	
TOTAL YOUNG		0		0		0		0	
TOTAL		0		0		0		0	

TABLE 3.2-12 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 18 MAY 1962.

RIVER FLOW (M ³ /SEC)		405							
STATION	TIME (GMT)	TM-LF-1241		TM-LF-1341		TM-LF-1342		TM-LF-141	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	2.14		2.14		2.14		2.14	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	19.9		19.9		19.9		19.9	
PH	REPLICATE	A B		A B		A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	37.23 36.17		33.05 33.5		38.97 38.85		34.89 33.97	
MEAN DENSITY	TAXA	113.71		55.86		571.90		198.54	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
DOROSOMA CEPEDIANUM									
CYPRINUS CARPIO									
NOTROPIS HUDSONIUS									
MINICHTHYS ATRATULUS									
SEMOTILUS CORPORALIS									
CARPIONUS CYPRINUS									
CATOSTOMUS COMMERSONI									
HYCENTILUM NIGRICANS									
MOXOSTOMA MACROLEPIDOTUM									
LEPOMIS GIBBOSUS/L. MACROCHIRUS									
POMOXIS NIGROMACULATUS									
POMOXIS SPP.									
ETHEOSTOMA OLIVACEUM									
ETHEOSTOMA ZONALE									
PERCINA PELTATA									
STIZOSTEDION V. VITREUM									
TOTAL LARVAE		46	38	65	73	223	192	83	71
YOUNG									
NOTROPIS SPILOPTERUS									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		46	38	65	73	223	192	83	71

TABLE 3.2-12 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 18 MAY 1962.

RIVER FLOW (M ³ /SEC)		405							
STATION	TIME (GMT)	TM-LF-10B1		TM-LF-10B2		TM-LF-10B3		TM-LF-9B1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	2.13		2.13		2.13		2.13	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	19.9		19.9		19.9		19.9	
PH	REPLICATE	A B		A B		A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	39.51 38.78		36.81 35.75		35.56 34.87		37.83 36.88	
MEAN DENSITY	TAXA	113.71		55.86		571.90		198.54	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
DOROSOMA CEPEDIANUM									
CYPRINUS CARPIO									
NOTROPIS HUDSONIUS									
MINICHTHYS ATRATULUS									
SEMOTILUS CORPORALIS									
CARPIONUS CYPRINUS									
CATOSTOMUS COMMERSONI									
HYCENTILUM NIGRICANS									
MOXOSTOMA MACROLEPIDOTUM									
LEPOMIS GIBBOSUS/L. MACROCHIRUS									
POMOXIS NIGROMACULATUS									
POMOXIS SPP.									
ETHEOSTOMA OLIVACEUM									
ETHEOSTOMA ZONALE									
PERCINA PELTATA									
STIZOSTEDION V. VITREUM									
TOTAL LARVAE		1	2	18	9	23	16	35	8
YOUNG									
NOTROPIS SPILOPTERUS									
TOTAL YOUNG		8	10	0	0	0	0	0	0
TOTAL		15	7	18	9	23	16	35	8

TABLE 3.2-13 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 25 MAY 1982.

RIVER FLOW (M ³ /SEC)		523							
STATION		TM-LF-1241		TM-LF-1341		TM-LF-1342		TM-LF-1441	
TIME (DST)		0906		1139		1001		1110	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		21		20		20		20	
WATER TEMP (C)		16.5		16.0		16.0		16.0	
DISSOLVED OXYGEN (PPM)		8.0		8.5		8.5		8.0	
PH		8.2		8.2		8.1		8.1	
SECCHI (CM)		91		91		91		91	
REPLICATE									
VOLUME SAMPLED (M ³)		36.16	35.33	33.70	33.11	37.61	36.90	36.67	36.12
DENSITY		8.30	0.00	2.97	9.06	5.31	6.42	63.45	58.62
MEAN DENSITY			1.15		0.01		5.37		0.01
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
DOROSOMA CEPEDIANUM	0	0.00	0	0.00	0	0.00	0	0.00	8.79
CYPRINIDAE	0	0.00	0	0.00	0	0.00	0	0.00	1.43
CYPRINUS CARPIO	0	0.00	0	0.00	0	0.00	0	0.00	1.43
NOTROPIS ANOENUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS ANOENUS/N. VOLUCELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS HUDSONIUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS PRONE	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
CARPIDAE CYPRINUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
LEPOMIS GIBBOSUS/N. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
ETHEOSOMA OLMSYEDI	0	0.00	0	0.00	0	0.00	0	0.00	0.00
ETHEOSOMA ZONALE	0	0.00	0	0.00	0	0.00	0	0.00	0.00
PERCINA PELTATA	0	0.00	0	0.00	0	0.00	0	0.00	0.00
TOTAL LARVAE	1	0.00	0	0.00	0	0.00	0	0.00	0.00
YOUNG									
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0.00
TOTAL	1	0	1	1	1	2	2	22	20

TABLE 3.2-13 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 25 MAY 1982.

RIVER FLOW (M ³ /SEC)		523							
STATION		TM-LF-10B1		TM-LF-10B2		TM-LF-10B3		TM-LF-9B1	
TIME (DST)		0920		1012		1020		1011	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		16.5		16.0		16.0		16.0	
WATER TEMP (C)		16.0		16.0		16.0		16.0	
DISSOLVED OXYGEN (PPM)		8.0		8.1		8.1		8.0	
PH		8.2		8.2		8.1		8.1	
SECCHI (CM)		94		94		94		94	
REPLICATE									
VOLUME SAMPLED (M ³)		34.86	34.39	35.37	34.78	34.13	33.07	34.91	33.67
DENSITY		2.87	0.00	8.48	2.88	0.00	0.00	0.00	2.97
MEAN DENSITY			1.43		5.68		0.00		1.49
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
DOROSOMA CEPEDIANUM	0	0.00	0	0.00	0	0.00	0	0.00	0.00
CYPRINIDAE	0	0.00	0	0.00	0	0.00	0	0.00	0.00
CYPRINUS CARPIO	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS ANOENUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS ANOENUS/N. VOLUCELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS HUDSONIUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS PRONE	0	0.00	0	0.00	0	0.00	0	0.00	0.00
NOTROPIS SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
CARPIDAE CYPRINUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
LEPOMIS GIBBOSUS/N. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	0.00
ETHEOSOMA OLMSYEDI	0	0.00	0	0.00	0	0.00	0	0.00	0.00
ETHEOSOMA ZONALE	0	0.00	0	0.00	0	0.00	0	0.00	0.00
PERCINA PELTATA	0	0.00	0	0.00	0	0.00	0	0.00	0.00
TOTAL LARVAE	1	0.00	0	0.00	0	0.00	0	0.00	0.00
YOUNG									
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0.00
TOTAL	1	0	1	1	1	0	0	0	1

TABLE 3.2-13 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 25 MAY 1982.

RIVER FLOW (M ³ /SEC)		523			
STATION		TM-LF-11A1		TM-LF-11A1	
TIME (DST)	11:49				
CURRENT VELOCITY (CM/SEC)	5				
AIR TEMP (C)	20.0				
WATER TEMP (C)	19.9				
DISSOLVED OXYGEN (PPM)	8.5				
PH	8.2				
REPLICATE					
VOLUME SAMPLED (M ³)		36.05	30.63	37.30	36.77
DENSITY		13.53	12.81	2.68	2.72
MEAN DENSITY		9.57		2.70	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE					
DOROSOMA CEPEDIANUM	0	0.00	0.00	0.00	0.00
CYPRINIDAE	0	0.00	0.00	0.00	0.00
CYPRINUS CARPIO	0	0.00	0.00	0.00	0.00
NOTROPIS AMOENUS	0	0.00	0.00	0.00	0.00
NOTROPIS AMOENUS/N. VOLUCELLUS	0	0.00	0.00	0.00	0.00
NOTROPIS AMOENIUS	0	0.00	0.00	0.00	0.00
NOTROPIS PROONE	0	0.00	0.00	0.00	0.00
NOTROPIS SPILOPTERUS	0	0.00	0.00	0.00	0.00
CARPIODES CYPRINUS	0	0.00	0.00	0.00	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0.00	0.00	0.00	0.00
ETHIOSTOMA OLMSTEDI	0	0.00	0.00	0.00	0.00
ETHIOSTOMA ZONALE	0	0.00	0.00	0.00	0.00
PERCINA PELTATA	0	0.00	0.00	0.00	0.00
OTY' LARVAE	0	0.00	0.00	0.00	0.00
YOUNG					
TOTAL YOUNG	0	0.00	0.00	0.00	0.00
TOTAL	0	0	0	0	0

TABLE 3.2-14

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 25 MAY 1982.

RIVER FLOW (M ³ /SEC)		524							
STATION		TM-LF-18B1		TM-LF-15B1		TM-LF-18B1		TM-LF-12B1	
TIME (DST)	21:37								
CURRENT VELOCITY (CM/SEC)	5								
AIR TEMP (C)	16.9								
WATER TEMP (C)	17.7								
DISSOLVED OXYGEN (PPM)	8.1								
PH	8.2								
REPLICATE									
VOLUME SAMPLED (M ³)		39.60	38.60	39.83	38.19	33.65	33.65	40.30	40.30
DENSITY		16.16	17.88	30.77	41.89	88.34	86.96	89.34	78.45
MEAN DENSITY		18.43		38.53		62.40		81.89	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO	1	35.35	50.50	0	0	5.98	1	39.71	14.89
NOTROPIS AMOENUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
NOTROPIS HUONSIUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
NOTROPIS SPILOPTERUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
NOTROPIS VOLUCELLUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
NOTROPIS AMOENIUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
CARPIODES CYPRINUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
CATOSTOMUS COMMERSONI	0	0.00	0.00	0	0	0.00	0	0.00	0.00
ETHIOSTOMA MACROLEPIDOTUM	0	0.00	0.00	0	0	0.00	0	0.00	0.00
AMBLOPLITES RUPESSTRIS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
LEPOMIS MACROCHIRUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
NOTROPIS AMOENIUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
NOTROPIS NITROMACULATUS	0	0.00	0.00	0	0	0.00	0	0.00	0.00
ETHIOSTOMA OLMSTEDI	0	0.00	0.00	0	0	0.00	0	0.00	0.00
ETHIOSTOMA ZONALE	0	0.00	0.00	0	0	0.00	0	0.00	0.00
PERCINA PELTATA	0	0.00	0.00	0	0	0.00	0	0.00	0.00
TOTAL LARVAE	1	35.35	50.50	0	0	5.98	1	39.71	14.89
YOUNG									
ETHIOSTOMA OLMSTEDI	0	0.00	0.00	0	0	2.97	1	0.00	0.00
TOTAL YOUNG	0	0.00	0.00	0	0	2.97	1	0.00	0.00
TOTAL	1	35.35	50.50	0	0	8.95	2	39.71	14.89

TABLE 3.2-14 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 25 MAY 1982.

RIVER FLOW (M ³ /SEC)		524							
STATION	TIME (GMT)	TM-LF-1241		TM-LF-1A1		TM-LF-1341		TM-LF-141	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	21.0		21.0		21.0		22.5	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	16.0		16.0		16.0		16.0	
PH	REPLICATE	A B		A B		A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	17.29		17.29		17.29		17.29	
MEAN DENSITY	TAXA	14.82		30.76		91.04		141.47	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO									
NOTROPIS ARGENTUS									
NOTROPIS HUDSONIUS									
NOTROPIS SPILOPTERUS									
NOTROPIS VOLUCELLUS									
CARPIDUS CYRINUS									
CATOSTOMUS COMMERSONI									
MOXOSTOMA MACROLEPIDOTUM									
AMBLOPLITES RUPESTRIS									
LEPOMIS MACROCHIRUS									
LEPOMIS GIBBOSUS/L. MACROCHIRUS									
PERCINUS DOLOMIEVI									
PERCINUS NIGROMACULATUS									
ETHEOSTOMA OLIVACEUM									
ETHEOSTOMA DONALDSONI									
PERCINUS PELTATA									
TOTAL LARVAE		7	8	10	11	17	16	14	16
YOUNG									
ETHEOSTOMA OLIVACEUM									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		7	8	10	11	17	16	14	16

TABLE 3.2-14 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 25 MAY 1982.

RIVER FLOW (M ³ /SEC)		524							
STATION	TIME (GMT)	TM-LF-1081		TM-LF-1082		TM-LF-1083		TM-LF-1081	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	21.0		21.0		21.0		22.5	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	16.0		16.0		16.0		16.0	
PH	REPLICATE	A B		A B		A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	19.98		19.98		19.98		19.98	
MEAN DENSITY	TAXA	12.51		85.70		31.73		108.93	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO									
NOTROPIS ARGENTUS									
NOTROPIS HUDSONIUS									
NOTROPIS SPILOPTERUS									
NOTROPIS VOLUCELLUS									
CARPIDUS CYRINUS									
CATOSTOMUS COMMERSONI									
MOXOSTOMA MACROLEPIDOTUM									
AMBLOPLITES RUPESTRIS									
LEPOMIS MACROCHIRUS									
LEPOMIS GIBBOSUS/L. MACROCHIRUS									
PERCINUS DOLOMIEVI									
PERCINUS NIGROMACULATUS									
ETHEOSTOMA OLIVACEUM									
ETHEOSTOMA DONALDSONI									
PERCINUS PELTATA									
TOTAL LARVAE		7	8	11	7	13	12	17	14
YOUNG									
ETHEOSTOMA OLIVACEUM									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		7	8	11	7	13	12	17	14

TABLE 3.2-15 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 2 JUNE 1982.

RIVER FLOW (M ³ /SEC)		1196		1281		1381		1482		1584	
STATION		TM-LF-1281		TM-LF-1381		TM-LF-1482		TM-LF-1584			
TIME (DST)		1:11		1:23		1:35		1:47			
CURRENT VELOCITY (CM/SEC)		1.1		1.1		1.1		1.1			
AIR TEMP (C)		20.3		20.3		20.3		20.3			
WATER TEMP (C)		20.3		20.3		20.3		20.3			
DISSOLVED OXYGEN (PPM)		14.1		14.1		14.1		14.1			
PH		7.7		7.7		7.7		7.7			
SECCHI (CM)		0.6		0.6		0.6		0.6			
REPLICATE		A		B		A		B		A	
VOLUME SAMPLED (M ³)		30.80		39.07		31.00		30.00		30.00	
DENSITY		85.40		71.70		6.97		18.54		10.00	
MEAN DENSITY		78.58		71.76		13.09		58.83		7.66	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE											
CYPRINIDAE		00		0000		0000		0000		0000	
CYPRINUS CARPIO		00		0000		0000		0000		0000	
NOTROPIS AMOENUS		00		0000		0000		0000		0000	
NOTROPIS HUDSONIUS		00		0000		0000		0000		0000	
NOTROPIS PROCNES		00		0000		0000		0000		0000	
NOTROPIS SPILOPTERUS		00		0000		0000		0000		0000	
PIEHPHALES NOTATUS		00		0000		0000		0000		0000	
DWINICHTHYS ATRATULUS		00		0000		0000		0000		0000	
CARPIODES CYPRINUS		00		0000		0000		0000		0000	
CATOSTOMUS COMMERSONI		00		0000		0000		0000		0000	
HYPERILIUM NISERICANS		00		0000		0000		0000		0000	
NOXOSTOMA MACRODONTUM		00		0000		0000		0000		0000	
AMBLOPLITES RUPESTRIS		00		0000		0000		0000		0000	
LEPOMIS GIBBOSUS		00		0000		0000		0000		0000	
MICROPTERUS DOLOMIEUI		00		0000		0000		0000		0000	
ETHEOSTOMA OLMPSTEDI		00		0000		0000		0000		0000	
ETHEOSTOMA ZONALE		00		0000		0000		0000		0000	
PERCA FLAVESCENS		00		0000		0000		0000		0000	
TOTAL LARVAE		33		71		40		14		11	
YOUNG											
MICROPTERUS DOLOMIEUI		00		0000		0000		0000		0000	
ETHEOSTOMA OLMPSTEDI		00		0000		0000		0000		0000	
ETHEOSTOMA ZONALE		00		0000		0000		0000		0000	
TOTAL YOUNG		00		0000		0000		0000		0000	
TOTAL		34		71		40		14		11	

TABLE 3.2-15 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 2 JUNE 1982.

RIVER FLOW (M ³ /SEC)		1196		1081		1082		1083		1084	
STATION		TM-LF-1081		TM-LF-1082		TM-LF-1083		TM-LF-1084			
TIME (DST)		1:11		1:23		1:35		1:47			
CURRENT VELOCITY (CM/SEC)		1.1		1.1		1.1		1.1			
AIR TEMP (C)		20.3		20.3		20.3		20.3			
WATER TEMP (C)		20.3		20.3		20.3		20.3			
DISSOLVED OXYGEN (PPM)		14.1		14.1		14.1		14.1			
PH		7.7		7.7		7.7		7.7			
SECCHI (CM)		0.6		0.6		0.6		0.6			
REPLICATE		A		B		A		B		A	
VOLUME SAMPLED (M ³)		30.80		31.89		30.74		29.69		35.80	
DENSITY		85.40		71.70		6.97		18.54		10.00	
MEAN DENSITY		78.58		71.76		13.09		58.83		7.66	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE											
CYPRINIDAE		00		0000		0000		0000		0000	
CYPRINUS CARPIO		00		0000		0000		0000		0000	
NOTROPIS AMOENUS		00		0000		0000		0000		0000	
NOTROPIS HUDSONIUS		00		0000		0000		0000		0000	
NOTROPIS PROCNES		00		0000		0000		0000		0000	
NOTROPIS SPILOPTERUS		00		0000		0000		0000		0000	
PIEHPHALES NOTATUS		00		0000		0000		0000		0000	
DWINICHTHYS ATRATULUS		00		0000		0000		0000		0000	
CARPIODES CYPRINUS		00		0000		0000		0000		0000	
CATOSTOMUS COMMERSONI		00		0000		0000		0000		0000	
HYPERILIUM NISERICANS		00		0000		0000		0000		0000	
NOXOSTOMA MACRODONTUM		00		0000		0000		0000		0000	
AMBLOPLITES RUPESTRIS		00		0000		0000		0000		0000	
LEPOMIS GIBBOSUS		00		0000		0000		0000		0000	
MICROPTERUS DOLOMIEUI		00		0000		0000		0000		0000	
ETHEOSTOMA OLMPSTEDI		00		0000		0000		0000		0000	
ETHEOSTOMA ZONALE		00		0000		0000		0000		0000	
PERCA FLAVESCENS		00		0000		0000		0000		0000	
TOTAL LARVAE		33		71		40		14		11	
YOUNG											
MICROPTERUS DOLOMIEUI		00		0000		0000		0000		0000	
ETHEOSTOMA OLMPSTEDI		00		0000		0000		0000		0000	
ETHEOSTOMA ZONALE		00		0000		0000		0000		0000	
TOTAL YOUNG		00		0000		0000		0000		0000	
TOTAL		34		71		40		14		11	

TABLE 3.2-15 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 2 JUNE 1982.

RIVER FLOW (M ³ /SEC)		1146			
STATION	TIME (DST)	TM-LF-11A1		TM-LF-11B1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	10:45	11:00	10:45	11:00
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	19.5	20.0	18.5	19.5
SECCHI (CM)	REPLICATE	8	3	8	2
VOLUME SAMPLED (M ³)	DENSITY	30.21	29.85	28.08	25.14
MEAN DENSITY	TAXA	29.79	16.98	7.42	11.93
	N DENSITY	31.39		9.67	
	N DENSITY		N DENSITY		N DENSITY
LARVAE					
CYPRINUS CARPIO	0	0	0	0	0
NOTROPIS AMOENUS	0	0	0	0	0
NOTROPIS HUDSONIUS	0	0	0	0	0
NOTROPIS PROCE	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0
PIMPHALES NOTATUS	0	0	0	0	0
RHINICHTHYS ATRATULUS	0	0	0	0	0
CARPIONUS CYPRINUS	0	0	0	0	0
CATOSTOMUS COMMERSONI	0	0	0	0	0
HYDROPHILUM NIGRICANS	0	0	0	0	0
MACROSTOMUS MACROCEPHALUS	0	0	0	0	0
AMBLOPLITES RUPESTRIS	0	0	0	0	0
LEUCOMIS OMBOSUS	0	0	0	0	0
MICROPTERUS DOLOMIEUI	0	0	0	0	0
ETHEOSTOMA OLMSTEADI	0	0	0	0	0
ETHEOSTOMA ZONALE	0	0	0	0	0
PERCA FLAVESCENS	0	0	0	0	0
TOTAL LARVAE	0	0	0	0	0
YOUNG					
MICROPTERUS DOLOMIEUI	0	0	0	0	0
ETHEOSTOMA OLMSTEADI	0	0	0	0	0
ETHEOSTOMA ZONALE	0	0	0	0	0
TOTAL YOUNG	0	0	0	0	0
TOTAL	0	0	0	0	0

TABLE 3.2-16

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 2 JUNE 1982.

RIVER FLOW (M ³ /SEC)		1147							
STATION	TIME (DST)	TM-LF-14B1		TM-LF-15B1		TM-LF-16B1		TM-LF-12B1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	23:00	23:15	23:19	23:30	23:39	23:42	23:32	23:32
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5
SECCHI (CM)	REPLICATE	NA	NA	NA	NA	NA	NA	NA	NA
VOLUME SAMPLED (M ³)	DENSITY	111.12	87.40	103.88	33.82	19.52	10.52	34.87	38.87
MEAN DENSITY	TAXA	111.12	87.40	28.08	23.85	5.12	10.25	20.68	28.87
	N DENSITY					7.69			
	N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY
LARVAE									
CYPRINUS CARPIO	0	0	0	0	0	0	0	0	0
NOTROPIS AMOENUS	0	0	0	0	0	0	0	0	0
NOTROPIS HUDSONIUS	0	0	0	0	0	0	0	0	0
NOTROPIS PROCE	0	0	0	0	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0	0	0	0	0
RHINICHTHYS ATRATULUS	0	0	0	0	0	0	0	0	0
RHINICHTHYS CATARACTAE	0	0	0	0	0	0	0	0	0
SEMOTILUS ATROMACULATUS	0	0	0	0	0	0	0	0	0
SEMOTILUS COPRALIS	0	0	0	0	0	0	0	0	0
CARPIONUS CYPRINUS	0	0	0	0	0	0	0	0	0
CATOSTOMUS COMMERSONI	0	0	0	0	0	0	0	0	0
MACROSTOMUS MACROCEPHALUS	0	0	0	0	0	0	0	0	0
AMBLOPLITES RUPESTRIS	0	0	0	0	0	0	0	0	0
MICROPTERUS DOLOMIEUI	0	0	0	0	0	0	0	0	0
ETHEOSTOMA OLMSTEADI	0	0	0	0	0	0	0	0	0
ETHEOSTOMA ZONALE	0	0	0	0	0	0	0	0	0
PERCA FLAVESCENS	0	0	0	0	0	0	0	0	0
TOTAL LARVAE	0	0	0	0	0	0	0	0	0
YOUNG									
CATOSTOMUS COMMERSONI	0	0	0	0	0	0	0	0	0
MICROPTERUS SALMOIDES	0	0	0	0	0	0	0	0	0
ETHEOSTOMA OLMSTEADI	0	0	0	0	0	0	0	0	0
TOTAL YOUNG	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0

NA Not Available.

TABLE 3.2-16 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 2 JUNE 1982.

RIVER FLOW (M ³ /SEC)												
1147												
STATION												
TH-LF-12A1												
TH-LF-13A1												
TH-LF-13A2												
TH-LF-08A1												
TIME (GMT)												
CURRENT VELOCITY (CM/SEC)												
AIR TEMP (C)												
WATER TEMP (C)												
DISSOLVED OXYGEN (PPM)												
PH												
REPLICATE												
VOLUME SAMPLED (M ³)												
DENSITY												
MEAN DENSITY												
TAXA	A		B		A		B		A		B	
	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE												
CYPRINUS CARRIO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS AMOENUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS HUOSOMIUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS SPILOPTERUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM INICHTHYS ATRA TULUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM INICHTHYS CATARACTAE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SEMOTILUS ATROMACULATUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SEMOTILUS CORPORALIS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CARPIDOES CYPRINUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CATOSTOMUS COMMERSONI	1.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	15.00	0.00	7.00	0.00
MCROSTOMA MACROLEPIDOTUM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AMBLOPILITES RUPESSTRIS	2.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00
MICROPTERUS DOLOMISTEDII	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHEOSTOMA OLMSTEDI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHEOSTOMA ZONALE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERCINA PELTATA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LARVAE	16	0.00	18	0.00	19	0.00	21	0.00	103	0.00	118	0.00
YOUNG												
CATOSTOMUS COMMERSONI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MICROPTERUS SALMOTIDIS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHEOSTOMA OLMSTEDI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL YOUNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	16	0.00	18	0.00	19	0.00	21	0.00	103	0.00	118	0.00

TABLE 3.2-16 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 2 JUNE 1982.

RIVER FLOW (M ³ /SEC)												
1147												
STATION												
TH-LF-10B1												
TH-LF-10B2												
TH-LF-10B3												
TH-LF-08B1												
TIME (GMT)												
CURRENT VELOCITY (CM/SEC)												
AIR TEMP (C)												
WATER TEMP (C)												
DISSOLVED OXYGEN (PPM)												
PH												
REPLICATE												
VOLUME SAMPLED (M ³)												
DENSITY												
MEAN DENSITY												
TAXA	A		B		A		B		A		B	
	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE												
CYPRINUS CARRIO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS AMOENUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS HUOSOMIUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS SPILOPTERUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM INICHTHYS ATRA TULUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BM INICHTHYS CATARACTAE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SEMOTILUS ATROMACULATUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SEMOTILUS CORPORALIS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CARPIDOES CYPRINUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CATOSTOMUS COMMERSONI	0.00	0.00	0.00	0.00	1.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
MCROSTOMA MACROLEPIDOTUM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AMBLOPILITES RUPESSTRIS	0.00	0.00	0.00	0.00	5.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
MICROPTERUS DOLOMISTEDII	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHEOSTOMA OLMSTEDI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHEOSTOMA ZONALE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERCINA PELTATA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LARVAE	11	0.00	18	0.00	10	0.00	13	0.00	13	0.00	18	0.00
YOUNG												
CATOSTOMUS COMMERSONI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MICROPTERUS SALMOTIDIS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHEOSTOMA OLMSTEDI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL YOUNG	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	11	0.00	18	0.00	10	0.00	13	0.00	13	0.00	18	0.00

TABLE 3.2-16 (continued).

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 7 JUNE 1982.

RIVER FLOW (M ³ /SEC)		11N7			
STATION		TR-LF-11A1		TR-LF-11B1	
TIME (DST)		22:15		22:15	
CURRENT VELOCITY (CM/SEC)		4.0		4.0	
AIR TEMP (C)		18.0		18.0	
WATER TEMP (C)		19.1		19.1	
DISSOLVED OXYGEN (PPM)		8.1		8.1	
PH		8.0		8.0	
REPLICATE					
VOLUME SAMPLED (M ³)		39.85	39.45	33.77	32.91
DENSITY		205.34	177.45	50.35	78.99
MEAN DENSITY		101.39		84.67	
TAXA	N DENSITY	N DENSITY	N DENSITY	N DENSITY	
LARVAE					
CYPRINUS CARPIO	1	1	0	0	0
NOTROPIS HUDSONIUS	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0
PIRAPHALUS NOTATUS	0	0	0	0	0
RHINICHTHYS CATARACTAE	0	0	0	0	0
SENOTILLUS COPPORALIS	0	0	0	0	0
CARPIODES CYPRINUS	0	0	0	0	0
CATOSTOMUS COMMERSONI	0	0	0	0	0
NOXOSTOMA MACROLEPIDOTUM	0	0	0	0	0
AMBLIPLITES RUPESTRIS	0	0	0	0	0
MICROPTERUS DOLMISTEII	0	0	0	0	0
ETHEOSTOMA OLMSTEDI	0	0	0	0	0
ETHEOSTOMA ZONALE	13	2	5	2	15
PERCINA PELTATA	0	0	0	0	0
TOTAL LARVAE	81	70	17	26	
YOUNG					
CATOSTOMUS COMMERSONI	0	0	0	0	0
MICROPTERUS SALMOIDES	0	0	0	0	0
ETHEOSTOMA OLMSTEDI	0	0	0	0	0
TOTAL YOUNG	0	0	0	0	0
TOTAL	81	70	17	26	

TABLE 3.2-17

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 10 JUNE 1982.

RIVER FLOW (M ³ /SEC)		2775							
STATION		TR-LF-14B1		TR-LF-15B1		TR-LF-16B1		TR-LF-12B1	
TIME (DST)		07:15		09:00		10:00		09:00	
CURRENT VELOCITY (CM/SEC)		5.7		8.0		9.6		6.6	
AIR TEMP (C)		18.0		17.0		17.0		18.0	
WATER TEMP (C)		17.4		16.5		16.5		17.4	
DISSOLVED OXYGEN (PPM)		8.4		8.0		8.0		8.3	
PH		8.9		8.1		8.0		8.6	
SECCHI (CM)		36		46		15		30	
REPLICATE									
VOLUME SAMPLED (M ³)		40.43	40.86	31.92	32.77	32.94	33.68	33.74	31.57
DENSITY		39.57	48.95	3.13	0.00	4.11	0.98	4.74	10.00
MEAN DENSITY		44.26		1.57		18.98		23.98	
TAXA	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
NOTROPIS HUDSONIUS	1	2	1	1	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0	0	0	0	0
PIRAPHALUS NOTATUS	0	0	0	0	0	0	0	0	0
RHINICHTHYS CATARACTAE	0	0	0	0	0	0	0	0	0
SENOTILLUS COPPORALIS	0	0	0	0	0	0	0	0	0
CARPIODES CYPRINUS	0	0	0	0	0	0	0	0	0
CATOSTOMUS COMMERSONI	0	0	0	0	0	0	0	0	0
HYPENTILUM NIGRICANS	0	0	0	0	0	0	0	0	0
NOXOSTOMA MACROLEPIDOTUM	0	0	0	0	0	0	0	0	0
AMBLIPLITES RUPESTRIS	0	0	0	0	0	0	0	0	0
ETHEOSTOMA OLMSTEDI	0	0	0	0	0	0	0	0	0
ETHEOSTOMA ZONALE	12	5	1	1	1	0	1	0	0
TOTAL LARVAE	12	7	1	1	1	0	1	0	0
YOUNG									
NOTROPIS HUDSONIUS	0	0	0	0	0	0	0	0	0
HYPENTILUM NIGRICANS	0	0	0	0	0	0	0	0	0
ETHEOSTOMA ZONALE	1	0	0	0	0	0	0	0	0
TOTAL YOUNG	1	0	0	0	0	0	0	0	0
TOTAL	16	7	1	1	1	0	1	0	0

TABLE 3.2-17 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 10 JUNE 1982.

RIVER FLOW (M ³ /SEC)		2775							
STATION		TM-LF-12A1		TM-LF-13A1		TM-LF-13A2		TM-LF-24A1	
TIME (ST)		10:53		11:07		11:07		10:57	
CURRENT VELOCITY (CM/SEC)		0.93		1.07		1.07		1.07	
AIR TEMP (C)		17.4		17.4		17.4		17.4	
WATER TEMP (C)		17.4		17.4		17.4		17.4	
DISSOLVED OXYGEN (PPM)		8.8		8.8		8.8		8.8	
PH		8.8		8.8		8.8		8.8	
SECCHI (CM)		8.8		8.8		8.8		8.8	
REPLICATE		8.8		8.8		8.8		8.8	
VOLUME SAMPLED (M ³)		31.06		31.06		31.06		31.06	
DENSITY		3.22		3.22		3.22		3.22	
MEAN TAXA		9.91		11.08		16.37		1.15	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
NOTROPIS HUDSONIUS		0000	0000	0000	0000	0000	0000	0000	0000
NOTROPIS SPILOPTERUS		0000	0000	0000	0000	0000	0000	0000	0000
DIHEMALIS NOTATUS		0000	0000	0000	0000	0000	0000	0000	0000
RHINICHTHYS CATARACTE		0000	0000	0000	0000	0000	0000	0000	0000
SEMOTILUS CORPORALIS		0000	0000	0000	0000	0000	0000	0000	0000
CARPIONES CYPRINUS		0000	0000	0000	0000	0000	0000	0000	0000
CATOSTOMUS COMMERCIONI		0000	0000	0000	0000	0000	0000	0000	0000
HYPENTILUM NIGRICANS		0000	0000	0000	0000	0000	0000	0000	0000
MOXOSTOMA MACROLEPIDOTUM		0000	0000	0000	0000	0000	0000	0000	0000
AMBLORHYNCHUS RUPESTRIS		0000	0000	0000	0000	0000	0000	0000	0000
ETHEOSTOMA OLIVACEUM		0000	0000	0000	0000	0000	0000	0000	0000
ETHEOSTOMA ZONALE		0000	0000	0000	0000	0000	0000	0000	0000
TOTAL LARVAE		0000	0000	0000	0000	0000	0000	0000	0000
YOUNG									
NOTROPIS HUDSONIUS		0000	0000	0000	0000	0000	0000	0000	0000
HYPENTILUM NIGRICANS		0000	0000	0000	0000	0000	0000	0000	0000
ETHEOSTOMA ZONALE		0000	0000	0000	0000	0000	0000	0000	0000
TOTAL YOUNG		0000	0000	0000	0000	0000	0000	0000	0000
TOTAL		1	5	1	6	6	6	6	2

TABLE 3.2-17 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 10 JUNE 1982.

RIVER FLOW (M ³ /SEC)		2775							
STATION		TM-LF-10B1		TM-LF-10B2		TM-LF-10B3		TM-LF-10B4	
TIME (ST)		10:58		10:57		10:58		10:58	
CURRENT VELOCITY (CM/SEC)		0.93		1.07		1.07		1.07	
AIR TEMP (C)		17.4		17.4		17.4		17.4	
WATER TEMP (C)		17.4		17.4		17.4		17.4	
DISSOLVED OXYGEN (PPM)		8.8		8.8		8.8		8.8	
PH		8.8		8.8		8.8		8.8	
SECCHI (CM)		8.8		8.8		8.8		8.8	
REPLICATE		8.8		8.8		8.8		8.8	
VOLUME SAMPLED (M ³)		31.06		31.06		31.06		31.06	
DENSITY		3.22		3.22		3.22		3.22	
MEAN TAXA		10.80		15.79		22.97		6.52	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
NOTROPIS HUDSONIUS		0000	0000	0000	0000	0000	0000	0000	0000
NOTROPIS SPILOPTERUS		0000	0000	0000	0000	0000	0000	0000	0000
DIHEMALIS NOTATUS		0000	0000	0000	0000	0000	0000	0000	0000
RHINICHTHYS CATARACTE		0000	0000	0000	0000	0000	0000	0000	0000
SEMOTILUS CORPORALIS		0000	0000	0000	0000	0000	0000	0000	0000
CARPIONES CYPRINUS		0000	0000	0000	0000	0000	0000	0000	0000
CATOSTOMUS COMMERCIONI		0000	0000	0000	0000	0000	0000	0000	0000
HYPENTILUM NIGRICANS		0000	0000	0000	0000	0000	0000	0000	0000
MOXOSTOMA MACROLEPIDOTUM		0000	0000	0000	0000	0000	0000	0000	0000
AMBLORHYNCHUS RUPESTRIS		0000	0000	0000	0000	0000	0000	0000	0000
ETHEOSTOMA OLIVACEUM		0000	0000	0000	0000	0000	0000	0000	0000
ETHEOSTOMA ZONALE		0000	0000	0000	0000	0000	0000	0000	0000
TOTAL LARVAE		0000	0000	0000	0000	0000	0000	0000	0000
YOUNG									
NOTROPIS HUDSONIUS		0000	0000	0000	0000	0000	0000	0000	0000
HYPENTILUM NIGRICANS		0000	0000	0000	0000	0000	0000	0000	0000
ETHEOSTOMA ZONALE		0000	0000	0000	0000	0000	0000	0000	0000
TOTAL YOUNG		0000	0000	0000	0000	0000	0000	0000	0000
TOTAL		1	6	4	6	14	15	6	2

TABLE 3.2-17 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 10 JUNE 1982.

RIVER FLOW (M ³ /SEC)		2775			
STATION		TM-LF-11A1		TM-LF-16A1	
TIME (DST)		1134	1134	1104	1104
CURRENT VELOCITY (CM/SEC)		8.7	8.7	7.7	7.7
AIR TEMP (C)		19.4	19.4	18.5	18.5
WATER TEMP (C)		18.4	18.4	18.0	18.0
DISSOLVED O ₂ (PPM)		8.1	8.1	8.0	8.0
PH		8.1	8.1	8.0	8.0
REPLICATE		A	B	A	B
VOLUME SAMPLED (M ³)		32.85	32.37	32.65	32.56
MEAN DENSITY		0.00	3.09	8.13	10.74
TAXA		N DENSITY		N DENSITY	
LARVAE					
NOTROPIS HUDSONIUS	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0
HEPHALIS NOTATUS	0	0	0	0	0
RHINICHTHYS CATARACTAE	0	0	0	0	0
SPHODIUS CYPRIUS	0	0	0	0	0
CARPIDIUS CYPRIUS	0	0	0	0	0
CATOPTERUS COMBESONI	0	0	0	0	0
HYPENTILUM NIGRICANS	0	0	0	0	0
ETHIOSTOMA MACROLEPIDOTUM	0	0	0	0	0
ETHIOSTOMA GLMSTEDI	0	0	0	0	0
ETHIOSTOMA ZONALE	0	0	0	0	0
TOTAL LARVAE	0	0	0	0	0
YOUNG					
NOTROPIS HUDSONIUS	0	0	0	0	0
HYPENTILUM NIGRICANS	0	0	0	0	0
ETHIOSTOMA ZONALE	0	0	0	0	0
TOTAL YOUNG	0	0	0	0	0
TOTAL	0	1	2	5	

TABLE 3.2-18

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 10 JUNE 1982.

RIVER FLOW (M ³ /SEC)		2775							
STATION		TM-LF-14B1		TM-LF-15B1		TM-LF-181		TM-LF-12B1	
TIME (DST)		2117	2104	2339	2142	2142	2142	2142	2142
CURRENT VELOCITY (CM/SEC)		4.0	4.0	16.5	16.5	16.5	16.5	16.5	16.5
AIR TEMP (C)		17.0	16.2	16.5	16.5	16.5	16.5	16.5	16.5
WATER TEMP (C)		17.0	16.2	16.5	16.5	16.5	16.5	16.5	16.5
DISSOLVED O ₂ (PPM)		8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
PH		8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
REPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)		28.77	23.22	31.82	32.60	34.89	34.88	31.55	33.02
MEAN DENSITY		17.38	23.96	9.48	12.27	8.70	14.50	9.51	18.74
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
CYPRINUS CARPIO	0	0	0	0	0	0	0	0	0
NOTROPIS HUDSONIUS	1	0	0	0	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0	0	0	0	0
CARPIDIUS CYPRIUS	0	0	0	0	0	0	0	0	0
ETHIOSTOMA MACROLEPIDOTUM	0	0	0	0	0	0	0	0	0
ETHIOSTOMA GLMSTEDI	0	0	0	0	0	0	0	0	0
ETHIOSTOMA ZONALE	0	0	0	0	0	0	0	0	0
TOTAL LARVAE	1	0	0	0	0	0	0	0	0
YOUNG									
NOTROPIS HUDSONIUS	1	3	0	0	0	0	0	0	0
ETHIOSTOMA GLMSTEDI	0	0	0	0	0	0	0	0	0
TOTAL YOUNG	1	3	0	0	0	0	0	0	0
TOTAL	5	7	3	4	3	5	3	6	

TABLE 3.2-18 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 10 JUNE 1982.

RIVER FLOW (M ³ /SEC)		2775							
STATION	TIME (DST)	TM-LF-12A1		TM-LF-13A1		TM-LF-13A2		TM-LF-14A1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	17.4		17.4		17.4		17.4	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	8.4		8.4		8.4		8.4	
PH	REPLICATE	A B		A B		A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	31.85		31.65		32.74		34.78	
MEAN DENSITY	TAXA	0.70		15.70		12.20		0.00	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO									
NOTROPIS HUDSONIUS									
NOTROPIS SPLOPTERUS									
CARPIOIDES CYPRINUS									
NOTOSTOMA MACROLEPIDOTUM									
MICROPTERUS DOLOMIEUI									
ETHEOSTOMA OLMSTEDI									
ETHEOSTOMA ZONALE									
TOTAL LARVAE									
YOUNG									
NOTROPIS HUDSONIUS									
ETHEOSTOMA OLMSTEDI									
TOTAL YOUNG									
TOTAL									

TABLE 3.2-18 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 10 JUNE 1982.

RIVER FLOW (M ³ /SEC)		2775							
STATION	TIME (DST)	TM-LF-10B1		TM-LF-10B2		TM-LF-10B3		TM-LF-9B1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	12.1		12.1		12.1		12.1	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	8.1		8.1		8.1		8.1	
PH	REPLICATE	A B		A B		A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	33.74		33.07		32.59		34.71	
MEAN DENSITY	TAXA	6.30		18.14		18.81		5.76	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO									
NOTROPIS HUDSONIUS									
NOTROPIS SPLOPTERUS									
CARPIOIDES CYPRINUS									
NOTOSTOMA MACROLEPIDOTUM									
MICROPTERUS DOLOMIEUI									
ETHEOSTOMA OLMSTEDI									
ETHEOSTOMA ZONALE									
TOTAL LARVAE									
YOUNG									
NOTROPIS HUDSONIUS									
ETHEOSTOMA OLMSTEDI									
TOTAL YOUNG									
TOTAL									

TABLE 3.2-18 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 10 JUNE 1982.

RIVER FLOW (M ³ /SEC)		2775			
STATION	TIME (DST)	TM-LF-11A1		TM-LF-16A1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	14.0		14.0	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	8.1		8.1	
PH	REPLICATE	A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	33.00		34.11	
MEAN DENSITY	TAXA	4.00		0.00	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE					
CYPRINUS CARPIO					
NOTROPIS HUDSONIUS					
NOTROPIS SPLOPTERUS					
CARPIOIDES CYPRINUS					
NOTOSTOMA MACROLEPIDOTUM					
MICROPTERUS DOLOMIEUI					
ETHEOSTOMA OLMSTEDI					
ETHEOSTOMA ZONALE					
TOTAL LARVAE					
YOUNG					
NOTROPIS HUDSONIUS					
ETHEOSTOMA OLMSTEDI					
TOTAL YOUNG					
TOTAL					

TABLE 3.2-21 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSL NET IN YORK HAVEN POND DURING THE DAY ON 22 JUNE 1982.

RIVER FLOW (M ³ /SEC)		1096		1096		1096		1096	
STATION	TIME (05Y)	TH-LF-1081		TH-LF-1081		TH-LF-1082		TH-LF-1081	
CURRENT VELOCITY (CM/SEC)		1.1		1.1		1.1		1.1	
AIR TEMP (C)		17.9		17.9		17.9		17.9	
WATER TEMP (C)		17.9		17.9		17.9		17.9	
DISSOLVED OXYGEN (PPHM)		7.0		7.0		7.0		7.0	
PH		7.0		7.0		7.0		7.0	
SECHSI (CM)		1.0		1.0		1.0		1.0	
REPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)		31.88	31.29	31.21	31.21	31.21	31.21	31.21	31.21
DENSITY		0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
MEAN DENSITY		2.9		1.8		7.56		0.0	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE		0.00000		0.00000		0.00000		0.00000	
NO. BROOKS HUDSONIUS		0	0	0	0	0	0	0	0
AMPHIROE C. TORINUS		0	0	0	0	0	0	0	0
THECOSTERA ZONALIS		0	0	0	0	0	0	0	0
PELICINA PELTATA		0	0	0	0	0	0	0	0
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG		0.00000		0.00000		0.00000		0.00000	
NO. BROOKS HUDSONIUS		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0	0

TABLE 3.2-21 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSL NET IN YORK HAVEN POND DURING THE DAY ON 22 JUNE 1982.

RIVER FLOW (M ³ /SEC)		1096		1096		1096		1096	
STATION	TIME (05Y)	TH-LF-1081		TH-LF-1082		TH-LF-1082		TH-LF-1081	
CURRENT VELOCITY (CM/SEC)		1.1		1.1		1.1		1.1	
AIR TEMP (C)		17.9		17.9		17.9		17.9	
WATER TEMP (C)		17.9		17.9		17.9		17.9	
DISSOLVED OXYGEN (PPHM)		7.0		7.0		7.0		7.0	
PH		7.0		7.0		7.0		7.0	
SECHSI (CM)		1.0		1.0		1.0		1.0	
REPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)		32.98	32.91	33.21	32.88	33.21	32.91	32.38	33.62
DENSITY		0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
MEAN DENSITY		0.0		0.0		1.1		3.13	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE		0.00000		0.00000		0.00000		0.00000	
NO. BROOKS HUDSONIUS		0	0	0	0	0	0	0	0
AMPHIROE C. TORINUS		0	0	0	0	0	0	0	0
THECOSTERA ZONALIS		0	0	0	0	0	0	0	0
PELICINA PELTATA		0	0	0	0	0	0	0	0
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG		0.00000		0.00000		0.00000		0.00000	
NO. BROOKS HUDSONIUS		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0	0

TABLE 3.2-21 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSL NET IN YORK HAVEN POND DURING THE DAY ON 22 JUNE 1982.

RIVER FLOW (M ³ /SEC)		1096		1096	
STATION	TIME (05Y)	TH-LF-1141		TH-LF-1141	
CURRENT VELOCITY (CM/SEC)		1.1		1.1	
AIR TEMP (C)		17.9		17.9	
WATER TEMP (C)		17.9		17.9	
DISSOLVED OXYGEN (PPHM)		7.0		7.0	
PH		7.0		7.0	
SECHSI (CM)		1.0		1.0	
REPLICATE		A	B	A	B
VOLUME SAMPLED (M ³)		32.75	32.74	32.21	32.80
DENSITY		0.998	0.998	0.998	0.998
MEAN DENSITY		2.9		1.8	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE		0.00000		0.00000	
NO. BROOKS HUDSONIUS		0	0	0	0
AMPHIROE C. TORINUS		0	0	0	0
THECOSTERA ZONALIS		0	0	0	0
PELICINA PELTATA		0	0	0	0
TOTAL LARVAE		0	0	0	0
YOUNG		0.00000		0.00000	
NO. BROOKS HUDSONIUS		0	0	0	0
TOTAL YOUNG		0	0	0	0
TOTAL		0	0	0	0

TABLE 3.2+22 CONTINUED.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 22-23 JUNE 1982.

RIVER FLOW (M ³ /SEC)		1096			
STATION	TIME (DST)	TR-LF-1861		TR-LF-1861	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	13.40		13.30	
WATER TEMP (C)	PH	8.1		8.1	
DISSOLVED OXYGEN (PPM)	SECCHI (CM)	1.3		1.3	
REPLICATE		A		B	
VOLUME SAMPLED (M ³)	DENSITY	33.84		38.14	
MEAN DENSITY	TAXA	1.48		10.49	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE					
COCCODONIA CLIPEDIANUM		0	0	0	0
NOTROPIS HUDSONIUS		0	0	0	0
NOTROPIS ANDREUS		0	0	0	0
NOTROPIS ANDREUS/N. VOLUCELLUS		0	0	0	0
NOTROPIS HUDSONIUS		0	0	0	0
NOTROPIS SPILPTERUS		0	0	0	0
PHLEPHALIS NOTATUS		0	0	0	0
SEMOTILUS CORPORALIS		0	0	0	0
SEMOTILUS GIBBOSUS/L. MACROCHIRUS		0	0	0	0
SEMOTILUS ANNULARIS		0	0	0	0
POMOXIS NIGRONACILATUS		0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0
TOTAL LARVAE		0	0	0	0
YOUNG					
NOTROPIS HUDSONIUS		0	0	0	0
TOTAL YOUNG		0	0	0	0
TOTAL		1	8	4	3

TABLE 3.2+23

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 30 JUNE 1982.

RIVER FLOW (M ³ /SEC)		601							
STATION	TIME (DST)	TR-LF-1861		TR-LF-1861		TR-LF-1861		TR-LF-1861	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	11.40		11.40		11.40		11.40	
WATER TEMP (C)	PH	8.1		8.1		8.1		8.1	
DISSOLVED OXYGEN (PPM)	SECCHI (CM)	1.3		1.3		1.3		1.3	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)	DENSITY	33.75		32.96		33.24		32.84	
MEAN DENSITY	TAXA	0.76		0.97		0.97		0.97	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
COCCODONIA CLIPEDIANUM		0	0	0	0	0	0	0	0
NOTROPIS HUDSONIUS		0	0	0	0	0	0	0	0
NOTROPIS ANDREUS		0	0	0	0	0	0	0	0
NOTROPIS ANDREUS/N. VOLUCELLUS		0	0	0	0	0	0	0	0
NOTROPIS HUDSONIUS		0	0	0	0	0	0	0	0
NOTROPIS SPILPTERUS		0	0	0	0	0	0	0	0
PHLEPHALIS NOTATUS		0	0	0	0	0	0	0	0
SEMOTILUS CORPORALIS		0	0	0	0	0	0	0	0
SEMOTILUS GIBBOSUS/L. MACROCHIRUS		0	0	0	0	0	0	0	0
SEMOTILUS ANNULARIS		0	0	0	0	0	0	0	0
POMOXIS NIGRONACILATUS		0	0	0	0	0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG									
NOTROPIS HUDSONIUS		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		0	0	1	1	0	0	0	0

TABLE 3.2-23 continued.

NUMBER (N) AND DENSITY (N/LITER) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 30 JUNE 1982.

RIVER FLOW (M ³ /SEC)		601		601		601		601	
STATION		TH-LF-1241		TH-LF-1241		TH-LF-1242		TH-LF-1241	
TIME (GMT)		10:00		10:00		10:00		10:00	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		17.1		17.1		17.1		17.1	
WATER TEMP (C)		17.1		17.1		17.1		17.1	
DISSOLVED OXYGEN (PPM)		6.8		6.8		6.8		6.8	
DEPTH (CM)		0.00		0.00		0.00		0.00	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (L)		32.00		32.00		32.00		32.00	
DENSITY		0.998		0.998		0.998		0.998	
MEAN DENSITY		0.00		0.00		0.00		0.00	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
DOBISSONIA CEREDIANUM	0	0	0	0	0	0	0	0	0
CYPRINUS CARPIO	0	0	0	0	0	0	0	0	0
NOTROPIS AMGENUS	0	0	0	0	0	0	0	0	0
NOTROPIS AMGENUS/N. VOLUCELLUS	0	0	0	0	0	0	0	0	0
NOTROPIS HUGSONIUS	0	0	0	0	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0	0	0	0	0
MEPHALIS NOTATUS	0	0	0	0	0	0	0	0	0
MEPHALIS CORPORAIS	0	0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0	0	0	0	0	0	0	0
POMOXIS ANNULARIS	0	0	0	0	0	0	0	0	0
POMOXIS NIGROMACULATUS	0	0	0	0	0	0	0	0	0
ETHIOSOMA ZONALE	0	0	0	0	0	0	0	0	0
TOTAL LARVAE	0	0	0	0	0	0	0	0	0
YOUNG									
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0
TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	0

TABLE 3.2-23 continued.

NUMBER (N) AND DENSITY (N/LITER) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 30 JUNE 1982.

RIVER FLOW (M ³ /SEC)		601		601		601		601	
STATION		TH-LF-1081		TH-LF-1082		TH-LF-1083		TH-LF-1081	
TIME (GMT)		10:00		10:00		10:00		10:00	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		17.1		17.1		17.1		17.1	
WATER TEMP (C)		17.1		17.1		17.1		17.1	
DISSOLVED OXYGEN (PPM)		6.8		6.8		6.8		6.8	
DEPTH (CM)		0.00		0.00		0.00		0.00	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (L)		32.00		32.00		32.00		32.00	
DENSITY		0.998		0.998		0.998		0.998	
MEAN DENSITY		0.00		0.00		0.00		0.00	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
DOBISSONIA CEREDIANUM	0	0	0	0	0	0	0	0	0
CYPRINUS CARPIO	0	0	0	0	0	0	0	0	0
NOTROPIS AMGENUS	0	0	0	0	0	0	0	0	0
NOTROPIS AMGENUS/N. VOLUCELLUS	0	0	0	0	0	0	0	0	0
NOTROPIS HUGSONIUS	0	0	0	0	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0	0	0	0	0
MEPHALIS NOTATUS	0	0	0	0	0	0	0	0	0
MEPHALIS CORPORAIS	0	0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0	0	0	0	0	0	0	0
POMOXIS ANNULARIS	0	0	0	0	0	0	0	0	0
POMOXIS NIGROMACULATUS	0	0	0	0	0	0	0	0	0
ETHIOSOMA ZONALE	0	0	0	0	0	0	0	0	0
TOTAL LARVAE	0	0.00	0	0.00	0	0.00	0	0.00	0
YOUNG									
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0
TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	0

TABLE 3.2-24 continued.

NUMBER (NI) AND DENSITY (1/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 30 JUNE 1962.

RIVER FLOW (M ³ /SEC)		QD)							
STATION		TR-LF-12A1		TR-LF-12A2		TR-LF-12A2		TR-LF-12A3	
TIME (DST)	CURRENT VELOCITY (CM/SEC)	Replicate		Replicate		Replicate		Replicate	
AIR TEMP (C)	WATER TEMP (C)	Replicate		Replicate		Replicate		Replicate	
DISSOLVED OXYGEN (PPM)	PH	Replicate		Replicate		Replicate		Replicate	
REPLICATE		Replicate		Replicate		Replicate		Replicate	
VOLUME SAMPLED (M ³)	MEAN DENSITY	Replicate		Replicate		Replicate		Replicate	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
OSCARIA	CERCOPIANUM	0	0	0	0	0	0	0	0
CYPRINUS	CARPPIO	0	0	0	0	0	0	0	0
MCITROPIS	AMNIENUS	0	0	0	0	0	0	0	0
MCITROPIS	NUCULIUS	0	0	0	0	0	0	0	0
MCITROPIS	SPILOPTERUS	0	0	0	0	0	0	0	0
CARPIODES	CYPRINUS	0	0	0	0	0	0	0	0
LEPOMIS	CIRRHOSUS	0	0	0	0	0	0	0	0
ETHIOPIA	OLIVACEA	0	0	0	0	0	0	0	0
ETHIOPIA	MACROCHIRUS	0	0	0	0	0	0	0	0
ETHIOPIA	MALE	0	0	0	0	0	0	0	0
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG									
MCITROPIS	AMNIENUS	0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		6	6	3	7	12	19	10	7

TABLE 3.2-24 continued.

NUMBER (NI) AND DENSITY (1/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 30 JUNE 1962.

RIVER FLOW (M ³ /SEC)		QD)							
STATION		TR-LF-10B1		TR-LF-10B2		TR-LF-10B3		TR-LF-10B3	
TIME (DST)	CURRENT VELOCITY (CM/SEC)	Replicate		Replicate		Replicate		Replicate	
AIR TEMP (C)	WATER TEMP (C)	Replicate		Replicate		Replicate		Replicate	
DISSOLVED OXYGEN (PPM)	PH	Replicate		Replicate		Replicate		Replicate	
REPLICATE		Replicate		Replicate		Replicate		Replicate	
VOLUME SAMPLED (M ³)	MEAN DENSITY	Replicate		Replicate		Replicate		Replicate	
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
OSCARIA	CERCOPIANUM	0	0	0	0	0	0	0	0
CYPRINUS	CARPPIO	0	0	0	0	0	0	0	0
MCITROPIS	AMNIENUS	0	0	0	0	0	0	0	0
MCITROPIS	NUCULIUS	0	0	0	0	0	0	0	0
MCITROPIS	SPILOPTERUS	0	0	0	0	0	0	0	0
CARPIODES	CYPRINUS	0	0	0	0	0	0	0	0
LEPOMIS	CIRRHOSUS	0	0	0	0	0	0	0	0
ETHIOPIA	OLIVACEA	0	0	0	0	0	0	0	0
ETHIOPIA	MACROCHIRUS	0	0	0	0	0	0	0	0
ETHIOPIA	MALE	0	0	0	0	0	0	0	0
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG									
MCITROPIS	AMNIENUS	0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		7	10	11	102	19	17	84	87

TABLE 3.2-24 (CONTINUED).

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 5 TO 6 JUNE 1982.

RIVER FLOW (M ³ /SEC)		700		700		700		700	
STATION	TIME (DST)	TH-LF-11A1		TH-LF-11A1		TH-LF-11A1		TH-LF-11A1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	A		B		A		B	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	A		B		A		B	
PH	SECCHI (CM)	A		B		A		B	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)	DENSITY	34.08		34.05		30.77		37.48	
MEAN DENSITY	TAXA	82.77		86.93		118.65		85.37	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
NOTROPIS AMOENUS		0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS SPILOPTERUS		0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0.00	0	0.00	0	0.00	0	0.00
THEOSTOMA ZONALE		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL LARVAE		0	0.00	0	0.00	0	0.00	0	0.00
YOUNG									
NOTROPIS AMOENUS		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL YOUNG		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL		0	0.00	0	0.00	0	0.00	0	0.00

TABLE 3.2-25

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 6 JULY 1982.

RIVER FLOW (M ³ /SEC)		750		750		750		750	
STATION	TIME (DST)	TH-LF-12B1		TH-LF-12B1		TH-LF-12B1		TH-LF-12B1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	A		B		A		B	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	A		B		A		B	
PH	SECCHI (CM)	A		B		A		B	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)	DENSITY	35.81		31.87		37.25		37.07	
MEAN DENSITY	TAXA	0.00		0.00		8.03		0.00	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
NOTROPIS AMOENUS		0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS SPILOPTERUS		0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0.00	0	0.00	0	0.00	0	0.00
THEOSTOMA ZONALE		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL LARVAE		0	0.00	0	0.00	0	0.00	0	0.00
YOUNG									
NOTROPIS AMOENUS		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL YOUNG		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL		0	0.00	0	0.00	0	0.00	0	0.00

TABLE 3.2-25 (CONTINUED).

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 6 JULY 1982.

RIVER FLOW (M ³ /SEC)		750		750		750		750	
STATION	TIME (DST)	TH-LF-12A1		TH-LF-12A1		TH-LF-12A2		TH-LF-12A1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	A		B		A		B	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	A		B		A		B	
PH	SECCHI (CM)	A		B		A		B	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)	DENSITY	28.89		28.10		36.02		38.33	
MEAN DENSITY	TAXA	5.10		0.00		2.78		0.00	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
NOTROPIS AMOENUS		0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS SPILOPTERUS		0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0.00	0	0.00	0	0.00	0	0.00
THEOSTOMA ZONALE		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL LARVAE		0	0.00	0	0.00	0	0.00	0	0.00
YOUNG									
NOTROPIS AMOENUS		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL YOUNG		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL		0	0.00	0	0.00	0	0.00	0	0.00

TABLE 3.2-23 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 6 JULY 1962.

RIVER FLOW (M ³ /SEC)																	
750																	
STATION		TH-LF-10B1				TH-LF-10B2				TH-LF-10B3				TH-LF-9B1			
TIME (LST)		11:30				11:30				11:30				11:30			
CURRENT VELOCITY (CM/SEC)		0.00				0.00				0.00				0.00			
AIR TEMP (C)		28.7				28.3				28.3				28.3			
WATER TEMP (C)		28.7				28.3				28.3				28.3			
DISSOLVED OXYGEN (PPM)		8.3				8.0				8.0				8.0			
PH		8.3				8.0				8.0				8.0			
SECCHI (CM)		A				B				A				B			
REPLICATE		1				2				1				2			
VOLUME SAMPLED (M ³)		28.7				28.3				28.3				28.3			
DENSITY		0.00				0.00				0.00				0.00			
MEAN DENSITY		0.00				2.54				0.00				0.00			
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY			
LARVAE																	
NOTROPIS ARDENUS/N. VOLUTELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
NOTROPIS SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
LYTHEOSTOMA ZONALE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
TOTAL LARVAE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
YOUNG																	
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			

TABLE 3.2-25 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 6 JULY 1962.

RIVER FLOW (M ³ /SEC)										
750										
STATION		TH-LF-11A1				TH-LF-11A2				
TIME (LST)		11:30				11:30				
CURRENT VELOCITY (CM/SEC)		0.00				0.00				
AIR TEMP (C)		28.7				28.3				
WATER TEMP (C)		28.7				28.3				
DISSOLVED OXYGEN (PPM)		8.3				8.0				
PH		8.3				8.0				
SECCHI (CM)		A				B				
REPLICATE		1				2				
VOLUME SAMPLED (M ³)		31.50				34.60				
DENSITY		0.00				0.00				
MEAN DENSITY		0.00				0.00				
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY		
LARVAE										
NOTROPIS ARDENUS/N. VOLUTELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LYTHEOSTOMA ZONALE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
TOTAL LARVAE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
YOUNG										
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

TABLE 3.2-26

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 6 JULY 1962.

RIVER FLOW (M ³ /SEC)																	
750																	
STATION		TH-LF-14B1				TH-LF-15B1				TH-LF-16B1				TH-LF-12B1			
TIME (LST)		20:00				20:00				20:00				20:00			
CURRENT VELOCITY (CM/SEC)		0.00				0.00				0.00				0.00			
AIR TEMP (C)		28.7				28.3				28.3				28.3			
WATER TEMP (C)		28.7				28.3				28.3				28.3			
DISSOLVED OXYGEN (PPM)		8.3				8.0				8.0				8.0			
PH		8.3				8.0				8.0				8.0			
SECCHI (CM)		A				B				A				B			
REPLICATE		1				2				1				2			
VOLUME SAMPLED (M ³)		37.71				41.78				31.51				31.18			
DENSITY		38.15				35.08				8.95				0.00			
MEAN DENSITY		54.62				0.00				21.52				13.57			
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY		N DENSITY			
LARVAE																	
CYPRINUS CARPIO	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
NOTROPIS GIBBOSUS/L. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
NOTROPIS SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
NOTROPIS VOLUTELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
PIMPHALES NOTATUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
CARP JONES CYPRINUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
AMBLOPLETES RUPESSTRIS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
NOTROPIS GIBBOSUS/L. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
LYTHEOSTOMA ZONALE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
TOTAL LARVAE	11	34.15	2	4.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
YOUNG																	
NOTROPIS ARDENUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
NOTROPIS GIBBOSUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
ICTALURUS PUNCTATUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			
TOTAL	11	34.15	2	4.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00			

TABLE 3.2-26 CONTINUED.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 6 JULY 1962.

RIVER FLOW (M ³ /SEC)		75.0							
STATION		TR-LF-12A1		TR-LF-12A1		TR-LF-12A2		TR-LF-12A1	
TIME (DST)		21:15		21:15		21:15		21:15	
CURRENT VELOCITY (CM/SEC)		2.19		2.88		2.89		2.88	
AIR TEMP (C)		13.1		13.1		13.1		13.1	
WATER TEMP (C)		8.4		8.4		8.4		8.4	
DISSOLVED OXYGEN (PPM)		8.4		8.4		8.4		8.4	
PH		8.4		8.4		8.4		8.4	
REPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)		31.88	31.82	34.92	34.56	34.04	34.01	35.81	35.68
DENSITY		15.88	15.98	2.86	2.89	13.88	13.88	14.79	14.68
MEAN DENSITY	TAXA	22.19		2.88		16.93		14.40	
LARVAE		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
CYPRINUS CARPIO									
NOTROPIS CRISTATUS									
NOTROPIS SPILOPTERUS									
NOTROPIS VOLUCELLUS									
PIMPHALES NOTATUS									
CARPIDES CYPRINUS									
AMBLOPLITES RUPESTRIS									
LEPOMIS AURATUS									
LEPOMIS GIBBOSUS									
MICROPTERUS DOLYCHAEUS									
ETHIOSTOMA OLMSTEDI									
ETHIOSTOMA ZONALE									
TOTAL LARVAE		12	3	1	1	1	7	4	0
YOUNG		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
NOTROPIS AMENUS									
NOTROPIS HUDSONIUS									
ICHTALURUS PUNCTATUS									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		12	3	1	1	1	7	4	0

TABLE 3.2-26 CONTINUED.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 6 JULY 1962.

RIVER FLOW (M ³ /SEC)		75.0							
STATION		TR-LF-10B1		TR-LF-10B2		TR-LF-10B3		TR-LF-10B1	
TIME (DST)		21:15		21:15		21:15		21:15	
CURRENT VELOCITY (CM/SEC)		1.56		17.05		6.51		2.96	
AIR TEMP (C)		13.1		13.1		13.1		13.1	
WATER TEMP (C)		8.4		8.4		8.4		8.4	
DISSOLVED OXYGEN (PPM)		8.4		8.4		8.4		8.4	
PH		8.4		8.4		8.4		8.4	
REPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)		32.08	31.88	34.74	32.01	31.48	31.86	34.57	31.79
DENSITY		15.12	15.00	17.18	16.95	13.16	13.51	14.00	14.92
MEAN DENSITY	TAXA	11.56		17.05		6.51		2.96	
LARVAE		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
CYPRINUS CARPIO									
NOTROPIS CRISTATUS									
NOTROPIS SPILOPTERUS									
NOTROPIS VOLUCELLUS									
PIMPHALES NOTATUS									
CARPIDES CYPRINUS									
AMBLOPLITES RUPESTRIS									
LEPOMIS AURATUS									
LEPOMIS GIBBOSUS									
MICROPTERUS DOLYCHAEUS									
ETHIOSTOMA OLMSTEDI									
ETHIOSTOMA ZONALE									
TOTAL LARVAE		1	0	3	8	1	3	1	2
YOUNG		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
NOTROPIS AMENUS									
NOTROPIS HUDSONIUS									
ICHTALURUS PUNCTATUS									
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		1	0	3	8	1	3	1	2

TABLE 3.2-20 (CONTINUED).

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 4 JULY 1982.

RIVER FLOW (M ³ /SEC)		759			
STATION		TM-LF-11A		TM-LF-11A-1	
TIME (DST)		22:48		22:48	
CURRENT VELOCITY (CM/SEC)		0.00		0.00	
AIR TEMP (C)		20.00		20.00	
WATER TEMP (C)		20.00		20.00	
DISSOLVED OXYGEN (PPM)		10.00		10.00	
PH		7.00		7.00	
REPLICATE		A	B	A	B
VOLUME SAMPLED (M ³)		33.17	32.54	36.01	38.75
MEAN DENSITY		12.08	6.15	13.89	0.00
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE					
CYPRINUS CARPIO		0	0	0	0
NOTROPIS CRYSOLEUCAS		0	0	0	0
NOTROPIS SPILOPTERUS		0	0	0	0
MEGALOPTERUS		0	0	0	0
PIRAPHALIS NOTATUS		0	0	0	0
CARPIODON CYPRINUS		0	0	0	0
AMBLOPLITES RUPESTRIS		0	0	0	0
LEPOMIS AURATUS		0	0	0	0
LEPOMIS GIBBOSUS L. MACROCHIRUS		0	0	0	0
NOTROPIS AMOENUS		0	0	0	0
NOTROPIS HUSONII		0	0	0	0
ICTALURUS PUMILATUS		0	0	0	0
TOTAL LARVAE		0	0	0	0
YOUNG					
NOTROPIS AMOENUS		0	0	0	0
NOTROPIS HUSONII		0	0	0	0
ICTALURUS PUMILATUS		0	0	0	0
TOTAL YOUNG		0	0	0	0
TOTAL		0	0	0	0

TABLE 3.2-21

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 13 JULY 1982.

RIVER FLOW (M ³ /SEC)		394							
STATION		TM-LF-11B1		TM-LF-11B1		TM-LF-11B1		TM-LF-12B1	
TIME (DST)		13:48		13:48		13:48		13:48	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		24.00		24.00		24.00		24.00	
WATER TEMP (C)		24.00		24.00		24.00		24.00	
DISSOLVED OXYGEN (PPM)		10.00		10.00		10.00		10.00	
PH		7.00		7.00		7.00		7.00	
REPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)		20.60	20.28	30.01	35.21	20.82	29.19	33.98	34.01
MEAN DENSITY		269.27	287.83	0.00	2.84	6.83	6.88	128.50	164.85
TAXA		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO		0	0	0	0	0	0	0	0
NOTROPIS AMOENUS L. VOLUCELLUS		0	0	0	0	0	0	0	0
NOTROPIS SPILOPTERUS		0	0	0	0	0	0	0	0
NOTROPIS VOLUCELLUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS L. MACROCHIRUS		1	1	0	0	0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL LARVAE		1	1	0	0	0	0	0	0
YOUNG									
ETHIOSTOMA ZONALE		1	0	0	0	0	0	0	0
TOTAL YOUNG		1	0	0	0	0	0	0	0
TOTAL		102	117	0	1	2	2	43	54

TABLE 3.2-27 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 13 JULY 1982.

RIVER FLOW (M ³ /SEC)		394							
STATION	TIME (EST)	TM-LF-12A1		TM-LF-12A1		TM-LF-12A2		TM-LF-12A1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	108.5		108.3		103.1		100.8	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	19.7		19.7		19.7		19.7	
PH	SECCHI (CM)	8.6		7.6		6.3		6.3	
REPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)	DENSITY	38.82	38.00	31.84	31.84	34.45	34.45	14.40	14.40
MEAN DENSITY	TAXA	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO		0	0	0	0	0	0	0	0
NO TROPIC AMOENUS/N. VOLUCELLUS		0	0	0	0	0	0	0	0
NO TROPIC SPILOPTERUS		0	0	0	0	0	0	0	0
NO TROPIC VOLUCELLUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0	0	0	0	0	0	0
ETHEOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG									
ETHEOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0	0

TABLE 3.2-27 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 13 JULY 1982.

RIVER FLOW (M ³ /SEC)		394							
STATION	TIME (EST)	TM-LF-10B1		TM-LF-10B2		TM-LF-10B1		TM-LF-10B1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	109.5		102.3		103.1		100.8	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	19.7		19.7		19.7		19.7	
PH	SECCHI (CM)	8.6		7.6		6.3		6.3	
REPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)	DENSITY	38.82	38.00	31.84	31.84	34.45	34.45	14.40	14.40
MEAN DENSITY	TAXA	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO		0	0	0	0	0	0	0	0
NO TROPIC AMOENUS/N. VOLUCELLUS		0	0	0	0	0	0	0	0
NO TROPIC SPILOPTERUS		0	0	0	0	0	0	0	0
NO TROPIC VOLUCELLUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0	0	0	0	0	0	0
ETHEOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL LARVAE		0	0	0	0	0	0	0	0
YOUNG									
ETHEOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		0	0	0	0	0	0	0	0

TABLE 3.2-27 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 13 JULY 1982.

RIVER FLOW (M ³ /SEC)		394			
STATION	TIME (EST)	TM-LF-11A1		TM-LF-11A1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	109.5		102.3	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	19.7		19.7	
PH	SECCHI (CM)	8.6		7.6	
REPLICATE		A	B	A	B
VOLUME SAMPLED (M ³)	DENSITY	27.32	25.87	27.77	27.07
MEAN DENSITY	TAXA	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE					
CYPRINUS CARPIO		1	3.66	0	0.00
NO TROPIC AMOENUS/N. VOLUCELLUS		0	0.00	0	0.00
NO TROPIC SPILOPTERUS		0	0.00	0	0.00
NO TROPIC VOLUCELLUS		0	0.00	0	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0.00	0	0.00
ETHEOSTOMA ZONALE		0	0.00	0	0.00
TOTAL LARVAE		1	3.66	0	0.00
YOUNG					
ETHEOSTOMA ZONALE		0	0.00	0	0.00
TOTAL YOUNG		0	0.00	0	0.00
TOTAL		1	3.66	0	0.00

TABLE 3.2-25

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 13 JULY 1982.

RIVER FLOW (M ³ /SEC)		394							
STATION		TR-LF-12B1		TR-LF-12B1		TR-LF-12B1		TR-LF-12B1	
TIME (DST)		2333		2333		2333		2333	
CURRENT VELOCITY (CM/SEC)		3.0		3.0		3.0		3.0	
AIR TEMP (C)		23.0		23.0		23.0		23.0	
WATER TEMP (C)		23.0		23.0		23.0		23.0	
DISSOLVED OXYGEN (PPM)		4.0		4.0		4.0		4.0	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		5.28		5.28		5.28		5.28	
DENSITY		0.9981		0.9981		0.9981		0.9981	
MEAN DENSITY		TAXA		TAXA		TAXA		TAXA	
		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
DORSOMA CEPEDIANUM	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYPRINUS CARPIO	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS CRYSOLEUCAS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS AEGENUS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS HUONONIS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS SPILOPTERUS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS VOLUCELLUS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AMBLOPITIS RUPESTRIS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS	18	3.41	1.84	0.00	0.00	0.00	0.00	0.00	0.00
ETHIOSTOMA OLIVACEUM	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHIOSTOMA ZONALE	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIDENTIFIABLE	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LARVAE	18	3.41	1.84	0.00	0.00	0.00	0.00	0.00	0.00
YOUNG									
ICTALURIS PUNCTATUS	1	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL YOUNG	1	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	19	3.60	1.84	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 3.2-26 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 13 JULY 1982.

RIVER FLOW (M ³ /SEC)		394							
STATION		TR-LF-13A1		TR-LF-13A1		TR-LF-13A2		TR-LF-421	
TIME (DST)		2149		2149		2149		2149	
CURRENT VELOCITY (CM/SEC)		3.0		3.0		3.0		3.0	
AIR TEMP (C)		23.0		23.0		23.0		23.0	
WATER TEMP (C)		23.0		23.0		23.0		23.0	
DISSOLVED OXYGEN (PPM)		4.0		4.0		4.0		4.0	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		11.18		11.18		11.18		11.18	
DENSITY		0.9981		0.9981		0.9981		0.9981	
MEAN DENSITY		TAXA		TAXA		TAXA		TAXA	
		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
DORSOMA CEPEDIANUM	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CYPRINUS CARPIO	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS CRYSOLEUCAS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS AEGENUS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS HUONONIS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS SPILOPTERUS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS VOLUCELLUS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AMBLOPITIS RUPESTRIS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHIOSTOMA OLIVACEUM	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ETHIOSTOMA ZONALE	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UNIDENTIFIABLE	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LARVAE	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
YOUNG									
ICTALURIS PUNCTATUS	1	0.09	0.10	0.05	0.01	0.03	0.00	0.00	0.00
TOTAL YOUNG	1	0.09	0.10	0.05	0.01	0.03	0.00	0.00	0.00
TOTAL	1	0.09	0.10	0.05	0.01	0.03	0.00	0.00	0.00

TABLE 3.2-29 CONTINUED.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 20 JULY 1962.

RIVER FLOW (M ³ /SEC)		306			
STATION		TM-LF-1181		TM-LF-1181	
TIME (GMT)					
CURRENT VELOCITY (CM/SEC)					
AIR TEMP (C)					
WATER TEMP (C)					
DISSOLVED OXYGEN (PPM)					
PH					
REPLICATE					
VOLUME SAMPLED (M ³)		22.86		22.86	
DENSITY		1.017		1.017	
MEAN DENSITY TAXA		N DENSITY x 30		N DENSITY x 30	
LARVAE					
OCYRHOPIA CEPEDIANUM		0	0	0	0
CYPRINUS CARPIO		0	0	0	0
NEOTROPIS VOLUCELLUS		0	0	0	0
NEOTROPIS ANDRINUS		0	0	0	0
NEOTROPIS VOLUCELLUS		0	0	0	0
AMPHILOPUS RUFISTRIS		0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		1	1	1	1
PERCIVUS NIGROMACULATUS		0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0
UNIDENTIFIABLE		0	0	0	0
TOTAL LARVAE		1	1	1	1
YOUNG					
TOTAL YOUNG		0	0	0	0
TOTAL		1	1	1	1

TABLE 3.2-30

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 20 JULY 1962.

RIVER FLOW (M ³ /SEC)		306							
STATION		TM-LF-1181		TM-LF-1181		TM-LF-181		TM-LF-1281	
TIME (GMT)									
CURRENT VELOCITY (CM/SEC)									
AIR TEMP (C)									
WATER TEMP (C)									
DISSOLVED OXYGEN (PPM)									
PH									
REPLICATE									
VOLUME SAMPLED (M ³)		55.27		55.27		31.80		31.27	
DENSITY		1.017		1.017		1.017		1.017	
MEAN DENSITY TAXA		N DENSITY x 30		N DENSITY x 30		N DENSITY x 30		N DENSITY x 30	
LARVAE									
OCYRHOPIA CEPEDIANUM		0	0	0	0	0	0	0	0
CYPRINUS CARPIO		0	0	0	0	0	0	0	0
NEOTROPIS VOLUCELLUS		0	0	0	0	0	0	0	0
NEOTROPIS ANDRINUS		0	0	0	0	0	0	0	0
NEOTROPIS VOLUCELLUS		0	0	0	0	0	0	0	0
AMPHILOPUS RUFISTRIS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		166	533	173	571	0	0	0	0
PERCIVUS NIGROMACULATUS		0	0	0	0	0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL LARVAE		172	551	173	571	0	0	0	0
YOUNG									
NEOTROPIS VOLUCELLUS		0	0	0	0	0	0	0	0
NEOTROPIS ANDRINUS		0	0	0	0	0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		172	551	173	571	0	0	0	0

TABLE 3.2-30 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 20 JULY 1982.

RIVER FLOW (M ³ /SEC)		301									
STATION		TR-LY-10A1		TR-LY-10A1		TR-LY-10A2		TR-LY-10A1			
CURRENT VELOCITY (CM/SEC)		3.3		3.3		3.3		3.3			
WATER TEMP (C)		17.00		17.00		17.00		17.00			
DISSOLVED OXYGEN (PPM)		4.8		4.8		4.8		4.8			
REPLICATE		A		B		A		B			
VOLUME SAMPLED (M ³)		31.4		31.4		31.4		31.4			
DENSITY		36.56		36.56		36.56		36.56			
MEAN DENSITY				7.90		32.42		803.77			
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY			
LARVAE											
UDOSTOMA	CEPEDIANUM	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
CYPRINUS	CARPIS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	ARGENTUS/CRYSOLEUCAS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	ARGENTUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	ARGENTUS/W. VOLUCELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	VOLUCELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
AMPHIPHILUS	RUPRESTIS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS	AURITUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS	RIBBOSUS/L. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS	ANNULARIS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS	NIGROMACULATUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	TOTAL LARVAE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
YOUNG											
NOTROPIS	HUDSONIUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ICTALURUS	PUNCTATUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
EYEDAYTONA	ZONALE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

TABLE 3.2-30 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 20 JULY 1982.

RIVER FLOW (M ³ /SEC)		306									
STATION		TR-LY-10B1		TR-LY-10B2		TR-LY-10B3		TR-LY-10B1			
CURRENT VELOCITY (CM/SEC)		3.3		3.3		3.3		3.3			
WATER TEMP (C)		17.00		17.00		17.00		17.00			
DISSOLVED OXYGEN (PPM)		4.8		4.8		4.8		4.8			
REPLICATE		A		B		A		B			
VOLUME SAMPLED (M ³)		31.4		31.4		31.4		31.4			
DENSITY		92.23		100.47		33.56		11.33			
MEAN DENSITY				100.47		33.56		11.33			
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY			
LARVAE											
UDOSTOMA	CEPEDIANUM	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
CYPRINUS	CARPIS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	ARGENTUS/CRYSOLEUCAS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	ARGENTUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	ARGENTUS/W. VOLUCELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	VOLUCELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
AMPHIPHILUS	RUPRESTIS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS	AURITUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS	RIBBOSUS/L. MACROCHIRUS	2	6.38	2	6.38	1	3.17	2	6.38	1	3.17
LEPOMIS	ANNULARIS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS	NIGROMACULATUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	TOTAL LARVAE	2	6.38	2	6.38	1	3.17	2	6.38	1	3.17
YOUNG											
NOTROPIS	HUDSONIUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS	SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ICTALURUS	PUNCTATUS	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
EYEDAYTONA	ZONALE	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
	TOTAL	2	6.38	2	6.38	1	3.17	2	6.38	1	3.17

TABLE 3.2-32 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 27 JULY 1982.

RIVER FLOW (M ³ /SEC)		35.7		35.7		35.7		35.7	
STATION	TIME (DST)	TR-LF-10A1		TR-LF-10A1		TR-LF-10A2		TR-LF-10A1	
CURRENT VELOCITY (CM/SEC)	WATER TEMP (C)	2.7 2.7		2.7 2.7		2.7 2.7		2.7 2.7	
DISSOLVED OXYGEN (PPM)	PH	8.2 8.2		8.2 8.2		8.2 8.2		8.2 8.2	
DUPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)	DENSITY	17.99	17.99	17.99	17.99	17.99	17.99	17.99	17.99
MEAN DENSITY	TAZA	18.70		18.70		18.70		18.70	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO		0	0	0	0	0	0	0	0
NOTEMIGONUS CHRYSOLEUCAS		1	1	1	1	1	1	1	1
NOTROPIS SPILOPTERUS		0	0	0	0	0	0	0	0
NOTROPIS VOLUCELLUS		0	0	0	0	0	0	0	0
AMBLOPLITES RUPESTRIS		0	0	0	0	0	0	0	0
LEPOMIS AURATUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0	0	0	0	0	0	0
TOTAL LARVAE		1	1	1	1	1	1	1	1
YOUNG									
NOTROPIS SPILOPTERUS		0	0	0	0	0	0	0	0
NOTROPIS VOLUCELLUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0	0	0	0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		1	1	1	1	1	1	1	1

TABLE 3.2-32 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 27 JULY 1982.

RIVER FLOW (M ³ /SEC)		35.7		35.7		35.7		35.7	
STATION	TIME (DST)	TR-LF-10B1		TR-LF-10B2		TR-LF-10B3		TR-LF-10B1	
CURRENT VELOCITY (CM/SEC)	WATER TEMP (C)	2.7 2.7		2.7 2.7		2.7 2.7		2.7 2.7	
DISSOLVED OXYGEN (PPM)	PH	8.2 8.2		8.2 8.2		8.2 8.2		8.2 8.2	
DUPLICATE		A	B	A	B	A	B	A	B
VOLUME SAMPLED (M ³)	DENSITY	17.99	17.99	17.99	17.99	17.99	17.99	17.99	17.99
MEAN DENSITY	TAZA	17.78		17.81		17.83		17.85	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
CYPRINUS CARPIO		0	0	0	0	0	0	0	0
NOTEMIGONUS CHRYSOLEUCAS		1	1	1	1	1	1	1	1
NOTROPIS SPILOPTERUS		0	0	0	0	0	0	0	0
NOTROPIS VOLUCELLUS		0	0	0	0	0	0	0	0
AMBLOPLITES RUPESTRIS		0	0	0	0	0	0	0	0
LEPOMIS AURATUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0	0	0	0	0	0	0
TOTAL LARVAE		1	1	1	1	1	1	1	1
YOUNG									
NOTROPIS SPILOPTERUS		0	0	0	0	0	0	0	0
NOTROPIS VOLUCELLUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0	0	0	0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		1	1	1	1	1	1	1	1

TABLE 3.2-32 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 27 JULY 1982.

RIVER FLOW (M ³ /SEC)		35.7		35.7	
STATION	TIME (DST)	TR-LF-11A1		TR-LF-11A1	
CURRENT VELOCITY (CM/SEC)	WATER TEMP (C)	2.7 2.7		2.7 2.7	
DISSOLVED OXYGEN (PPM)	PH	8.2 8.2		8.2 8.2	
DUPLICATE		A	B	A	B
VOLUME SAMPLED (M ³)	DENSITY	17.99	17.99	17.99	17.99
MEAN DENSITY	TAZA	19.06		19.86	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE					
CYPRINUS CARPIO		0	0	0	0
NOTEMIGONUS CHRYSOLEUCAS		0	0	0	0
NOTROPIS SPILOPTERUS		1	1	1	1
NOTROPIS VOLUCELLUS		0	0	0	0
AMBLOPLITES RUPESTRIS		0	0	0	0
LEPOMIS AURATUS		0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0	0	0
TOTAL LARVAE		1	1	1	1
YOUNG					
NOTROPIS SPILOPTERUS		0	0	0	0
NOTROPIS VOLUCELLUS		0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0	0	0
ETHIOSTOMA ZONALE		0	0	0	0
TOTAL YOUNG		0	0	0	0
TOTAL		1	1	1	1

TABLE 3.2-33 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 3 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		351			
STATION	TIME (DST)	TM-LF-1181		TM-LF-1181	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	21.1		21.1	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	10.0		10.0	
PH	SECCHI (CM)	10.0		10.0	
REPLICATE		A		B	
VOLUME SAMPLED (M ³)	DENSITY	32.79		31.62	
MEAN DENSITY	TAXA	9.15		9.18	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE					
NOTROPIS CEPHEJANUM		0	0	0	0
NOTROPIS SPILOPTERUS		0	0	0	0
NOTROPIS VOLUCCELLUS		0	0	0	0
LEPOMIS GIBBOSUS A. MACROCHIRUS		0	0	0	0
TOTAL LARVAE		0	0	0	0
YOUNG					
NOTROPIS SPILOPTERUS		0	0	1	0
TOTAL YOUNG		0	0	1	0
TOTAL		0	0	1	0

TABLE 3.2-34

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 3 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		351							
STATION	TIME (DST)	TM-LF-1481		TM-LF-1581		TM-LF-1681		TM-LF-1781	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	21.1		21.1		21.1		21.1	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	10.0		10.0		10.0		10.0	
PH	SECCHI (CM)	10.0		10.0		10.0		10.0	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)	DENSITY	32.79		31.62		32.86		31.62	
MEAN DENSITY	TAXA	9.15		9.18		12.69		16.56	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
NOTEMIGONUS CHRYSOLEUCAS		2	0	0	0	0	0	0	0
NOTROPIS SPILOPTERUS		64	19	0	0	0	0	0	0
NOTROPIS VOLUCCELLUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS A. MACROCHIRUS		0	0	0	0	0	0	0	0
TOTAL LARVAE		66	19	0	0	0	0	0	0
YOUNG									
NOTROPIS SPILOPTERUS		0	0	0	0	0	0	0	0
NOTROPIS VOLUCCELLUS		0	0	0	0	0	0	0	0
TALURIUS PUNCTATUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS A. MACROCHIRUS		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		66	19	0	0	0	0	0	0

TABLE 3.2-34 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 3 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		351							
STATION	TIME (DST)	TM-LF-1281		TM-LF-1381		TM-LF-1481		TM-LF-1581	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	21.1		21.1		21.1		21.1	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	10.0		10.0		10.0		10.0	
PH	SECCHI (CM)	10.0		10.0		10.0		10.0	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)	DENSITY	38.79		32.07		32.86		31.62	
MEAN DENSITY	TAXA	9.79		3.07		12.69		16.56	
		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE									
NOTEMIGONUS CHRYSOLEUCAS		0	0	0	0	0	0	0	0
NOTROPIS SPILOPTERUS		1	0	0	0	0	0	0	0
NOTROPIS VOLUCCELLUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS A. MACROCHIRUS		0	0	0	0	0	0	0	0
TOTAL LARVAE		1	0	0	0	0	0	0	0
YOUNG									
NOTROPIS SPILOPTERUS		0	0	0	0	0	0	0	0
NOTROPIS VOLUCCELLUS		0	0	0	0	0	0	0	0
TALURIUS PUNCTATUS		0	0	0	0	0	0	0	0
LEPOMIS GIBBOSUS A. MACROCHIRUS		0	0	0	0	0	0	0	0
TOTAL YOUNG		0	0	0	0	0	0	0	0
TOTAL		1	0	0	0	0	0	0	0

TABLE 3.2-33 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 3 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		35.1		35.1		35.1		35.1	
STATION	TIME (DST)	TR-NET-10B1		TR-NET-10B2		TR-NET-10B3		TR-NET-10B4	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	21.3		21.3		21.3		21.3	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	7.61		8.18		8.03		8.60	
PH	REPLICATE	A	B	A	B	A	B	A	B
VOLUME SAMPLED (L ³)	DENSITY	33.15		32.37		32.91		32.94	
MEAN DENSITY	TAXA	7.61		8.18		8.03		8.60	
LARVAE		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
NO. TROPIDIONUS CRYSOIDEUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
NO. TROPIDIONUS SPILOPTERUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
NO. TROPIDIONUS VOLUCCELLUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
NO. TROPIDIONUS SUPRESTRIS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
LE. PONTIS AURITUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
LE. PONTIS GIBBOSUS A. MACROCHIRUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
TOTAL LARVAE	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
YOUNG									
NO. TROPIDIONUS SPILOPTERUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
NO. TROPIDIONUS VOLUCCELLUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
ICTALURUS NATALIS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
ICTALURUS PUNCTATUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
LE. PONTIS GIBBOSUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
LE. PONTIS GIBBOSUS A. MACROCHIRUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
TOTAL YOUNG	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
TOTAL	3	2	12	12	14	6	5	1	

TABLE 3.2-34 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 3 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		35.1		35.1		35.1		35.1	
STATION	TIME (DST)	TR-NET-11A1		TR-NET-11B1		TR-NET-11B2		TR-NET-11B3	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	21.3		21.3		21.3		21.3	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	7.61		8.18		8.03		8.60	
PH	REPLICATE	A	B	A	B	A	B	A	B
VOLUME SAMPLED (L ³)	DENSITY	32.76		32.52		32.23		32.21	
MEAN DENSITY	TAXA	7.61		8.18		8.03		8.60	
LARVAE		N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
NO. TROPIDIONUS CRYSOIDEUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
NO. TROPIDIONUS SPILOPTERUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
NO. TROPIDIONUS VOLUCCELLUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
NO. TROPIDIONUS SUPRESTRIS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
LE. PONTIS AURITUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
LE. PONTIS GIBBOSUS A. MACROCHIRUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
TOTAL LARVAE	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
YOUNG									
NO. TROPIDIONUS SPILOPTERUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
NO. TROPIDIONUS VOLUCCELLUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
ICTALURUS NATALIS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
ICTALURUS PUNCTATUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
LE. PONTIS GIBBOSUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
LE. PONTIS GIBBOSUS A. MACROCHIRUS	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
TOTAL YOUNG	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
TOTAL	11	8	3	1					

TABLE 3.2-35 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 10 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		261			
STATION		TM-LF-1281		TM-LF-1281	
TIME (GMT)		0954		1111	
CURRENT VELOCITY (CM/SEC)		0.00		0.00	
AIR TEMP (C)		20.00		20.00	
WATER TEMP (C)		19.00		19.00	
DISSOLVED OXYGEN (PPM)		8.00		8.00	
PH		8.00		8.00	
REPLICATE		A		B	
VOLUME SAMPLED (M ³)		32.23		32.23	
DENSITY		3.10		3.10	
MEAN DENSITY		A: 22		B: 22	
TAXA		N DENSITY		N DENSITY	
LARVAE					
DOBISSONIA	LEPIDIANUM	0.00	0.00	0.00	0.00
CYPRINUS	CARRIO	0.00	0.00	0.00	0.00
NOTROPIS	SPILOPTERUS	0.00	0.00	0.00	0.00
NOTROPIS	YOLUCELLUS	0.00	0.00	0.00	0.00
LEPOMIS	AURITUS	0.00	0.00	0.00	0.00
LEPOMIS	GIBBOSUS/L. MACROCHIRUS	0.00	0.00	0.00	0.00
TOTAL LARVAE		0.00	0.00	0.00	0.00
YOUNG					
NOTROPIS	SPILOPTERUS	0.00	0.00	0.00	0.00
LEPOMIS	GIBBOSUS/L. MACROCHIRUS	0.00	0.00	0.00	0.00
TOTAL YOUNG		0.00	0.00	0.00	0.00
TOTAL		1	3	0	4

TABLE 3.2-36

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 10 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		261							
STATION		TM-LF-1281		TM-LF-1581		TM-LF-1581		TM-LF-1581	
TIME (GMT)		2035		2116		2109		2303	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		20.00		21.00		21.00		21.00	
WATER TEMP (C)		19.00		19.00		19.00		19.00	
DISSOLVED OXYGEN (PPM)		8.00		8.00		8.00		8.00	
PH		8.00		8.00		8.00		8.00	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		110.24		110.28		31.84		31.84	
DENSITY		3.14		3.14		3.14		3.14	
MEAN DENSITY		115.67		3.14		3.67		7.95	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
NOTEMIGONUS	CRYSOLEUCAS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	SPILOPTERUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	YOLUCELLUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AMBLOPLITES	RUPESSTRIS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	AURITUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	GIBBOSUS/L. MACROCHIRUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LARVAE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
YOUNG									
NOTEMIGONUS	CRYSOLEUCAS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	SPILOPTERUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	YOLUCELLUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	GIBBOSUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	MACROCHIRUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	GIBBOSUS/L. MACROCHIRUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL YOUNG		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		36	34	1	1	0	1	3	2

TABLE 3.2-36 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 10 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		261							
STATION		TM-LF-1281		TM-LF-1381		TM-LF-1382		TM-LF-1481	
TIME (GMT)		2242		2316		2304		0111	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		20.00		20.00		20.00		20.00	
WATER TEMP (C)		19.00		19.00		19.00		19.00	
DISSOLVED OXYGEN (PPM)		8.00		8.00		8.00		8.00	
PH		8.00		8.00		8.00		8.00	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		34.61		34.61		33.01		33.01	
DENSITY		66.45		66.45		66.45		66.45	
MEAN DENSITY		75.12		9.09		20.07		204.52	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
NOTEMIGONUS	CRYSOLEUCAS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	SPILOPTERUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	YOLUCELLUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AMBLOPLITES	RUPESSTRIS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	AURITUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	GIBBOSUS/L. MACROCHIRUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LARVAE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
YOUNG									
NOTEMIGONUS	CRYSOLEUCAS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	SPILOPTERUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	YOLUCELLUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	GIBBOSUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	MACROCHIRUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LEPOMIS	GIBBOSUS/L. MACROCHIRUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL YOUNG		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		23	29	4	2	4	4	65	65

TABLE 3.2-36 (continued).

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 30 AUGUST 1982.

RIVER FLOW (M ³ /SEC)										
STATION										
CURRENT VELOCITY (CM/SEC)										
AIR TEMP (C)										
WATER TEMP (C)										
DISSOLVED OXYGEN (PPM)										
REPLICATE										
VOLUME SAMPLED (M ³)										
MEAN DENSITY										
TAXA										
N DENSITY										
LARVAE										
NE TEMICOMUS CRYSOLEUCAS	0		0		0		0		0	
NE TROPIS SPILOPTERUS	0		0		0		0		0	
NE TROPIS VOLUCELLUS	0		0		0		0		0	
LE PLOPILITES SUPRISTIS	0		0		0		0		0	
LE POMIS AURITUS	0		0		0		0		0	
LE POMIS GIBBOSUS	0		0		0		0		0	
LE POMIS GIBBOSUS A. MACROCHIRUS	0		0		0		0		0	
TOTAL LARVAE	0		0		0		0		0	
YOUNG										
NE TEMICOMUS CRYSOLEUCAS	0		0		0		0		0	
NE TROPIS SPILOPTERUS	0		0		0		0		0	
NE TROPIS VOLUCELLUS	0		0		0		0		0	
LE POMIS GIBBOSUS	0		0		0		0		0	
LE POMIS GIBBOSUS A. MACROCHIRUS	0		0		0		0		0	
TOTAL YOUNG	0		0		0		0		0	
TOTAL	0		0		0		0		0	

TABLE 3.2-36 (continued).

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 10 AUGUST 1982.

RIVER FLOW (M ³ /SEC)										
STATION										
CURRENT VELOCITY (CM/SEC)										
AIR TEMP (C)										
WATER TEMP (C)										
DISSOLVED OXYGEN (PPM)										
REPLICATE										
VOLUME SAMPLED (M ³)										
MEAN DENSITY										
TAXA										
N DENSITY										
LARVAE										
NE TEMICOMUS CRYSOLEUCAS	0		0		0		0		0	
NE TROPIS SPILOPTERUS	0		0		0		0		0	
NE TROPIS VOLUCELLUS	0		0		0		0		0	
LE PLOPILITES SUPRISTIS	0		0		0		0		0	
LE POMIS AURITUS	0		0		0		0		0	
LE POMIS GIBBOSUS	0		0		0		0		0	
LE POMIS GIBBOSUS A. MACROCHIRUS	0		0		0		0		0	
TOTAL LARVAE	0		0		0		0		0	
YOUNG										
NE TEMICOMUS CRYSOLEUCAS	0		0		0		0		0	
NE TROPIS SPILOPTERUS	0		0		0		0		0	
NE TROPIS VOLUCELLUS	0		0		0		0		0	
LE POMIS GIBBOSUS	0		0		0		0		0	
LE POMIS GIBBOSUS A. MACROCHIRUS	0		0		0		0		0	
TOTAL YOUNG	0		0		0		0		0	
TOTAL	0		0		0		0		0	

TABLE 3.2-37

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 16 AUGUST 1982.

RIVER FLOW (M ³ /SEC)										
STATION										
CURRENT VELOCITY (CM/SEC)										
AIR TEMP (C)										
WATER TEMP (C)										
DISSOLVED OXYGEN (PPM)										
REPLICATE										
VOLUME SAMPLED (M ³)										
MEAN DENSITY										
TAXA										
N DENSITY										
LARVAE										
NE TEMICOMUS CRYSOLEUCAS	0		0		0		0		0	
NE TROPIS SPILOPTERUS	0		0		0		0		0	
NE TROPIS VOLUCELLUS	0		0		0		0		0	
LE POMIS GIBBOSUS A. MACROCHIRUS	0		0		0		0		0	
TOTAL LARVAE	0		0		0		0		0	
YOUNG										
NE TEMICOMUS CRYSOLEUCAS	0		0		0		0		0	
NE TROPIS SPILOPTERUS	0		0		0		0		0	
NE TROPIS VOLUCELLUS	0		0		0		0		0	
LE POMIS GIBBOSUS	0		0		0		0		0	
LE POMIS GIBBOSUS A. MACROCHIRUS	0		0		0		0		0	
TOTAL YOUNG	0		0		0		0		0	
TOTAL	0		0		0		0		0	

TABLE 3.2-37 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 16 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		207							
STATION		TH-LF-12A1		TH-LF-12A1		TH-LF-12A2		TH-LF-12A4	
TIME (DST)		1004		1104		1104		1104	
CURRENT VELOCITY (CM/SEC)		1.1		1.1		1.1		1.1	
AIR TEMP (C)		23.0		23.0		23.0		23.0	
WATER TEMP (C)		23.0		23.0		23.0		23.0	
DISSOLVED OXYGEN (PPM)		8.9		8.9		8.9		8.9	
PH		8.1		8.1		8.1		8.1	
SECCHI (CM)		61		61		61		61	
REPLICATE		A B		A B		A B		A B	
VOLUME SAMPLED (M ³)		37.83		37.83		37.83		37.83	
DENSITY		2.58		2.58		2.58		2.58	
MEAN DENSITY		1.47		1.47		1.47		1.47	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		0		0		0		0	
NOTROPIS SPILOPTERUS		0		0		0		0	
NOTROPIS VOLUCELLUS		0		0		0		0	
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0		0		0		0	
TOTAL LARVAE		0		0		0		0	
YOUNG		0		0		0		0	
NOTROPIS SPILOPTERUS		0		0		0		0	
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0		0		0		0	
TOTAL YOUNG		0		0		0		0	
TOTAL		0		0		0		0	

TABLE 3.2-37 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 16 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		207							
STATION		TH-LF-10B1		TH-LF-10B2		TH-LF-10B3		TH-LF-9B1	
TIME (DST)		0925		0925		0925		0925	
CURRENT VELOCITY (CM/SEC)		0.9		0.9		0.9		0.9	
AIR TEMP (C)		23.0		23.0		23.0		23.0	
WATER TEMP (C)		23.0		23.0		23.0		23.0	
DISSOLVED OXYGEN (PPM)		8.9		8.9		8.9		8.9	
PH		8.1		8.1		8.1		8.1	
SECCHI (CM)		61		61		61		61	
REPLICATE		A B		A B		A B		A B	
VOLUME SAMPLED (M ³)		33.28		33.28		33.28		31.40	
DENSITY		2.58		2.58		2.58		2.58	
MEAN DENSITY		1.50		1.50		1.50		1.50	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		0		0		0		0	
NOTROPIS SPILOPTERUS		0		0		0		0	
NOTROPIS VOLUCELLUS		0		0		0		0	
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0		0		0		0	
TOTAL LARVAE		0		0		0		0	
YOUNG		0		0		0		0	
NOTROPIS SPILOPTERUS		0		0		0		0	
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0		0		0		0	
TOTAL YOUNG		0		0		0		0	
TOTAL		0		0		0		0	

TABLE 3.2-37 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 16 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		207			
STATION		TH-LF-11A1		TH-LF-11A1	
TIME (DST)		1104		1104	
CURRENT VELOCITY (CM/SEC)		1.1		1.1	
AIR TEMP (C)		23.0		23.0	
WATER TEMP (C)		23.0		23.0	
DISSOLVED OXYGEN (PPM)		8.9		8.9	
PH		8.1		8.1	
SECCHI (CM)		61		61	
REPLICATE		A B		A B	
VOLUME SAMPLED (M ³)		38.83		38.83	
DENSITY		2.58		2.58	
MEAN DENSITY		1.29		1.29	
TAXA		N DENSITY		N DENSITY	
LARVAE		1		1	
NOTROPIS SPILOPTERUS		0		0	
NOTROPIS VOLUCELLUS		0		0	
LEPOMIS GIBBOSUS/L. MACROCHIRUS		1		1	
TOTAL LARVAE		1		1	
YOUNG		0		0	
NOTROPIS SPILOPTERUS		0		0	
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0		0	
TOTAL YOUNG		0		0	
TOTAL		1		1	

TABLE 3.2-38 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 17 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		207			
STATION		TM-LF-161		TM-LF-1641	
TIME (DST)		22:30		23:00	
CURRENT VELOCITY (CM/SEC)		0.00		0.00	
AIR TEMP (C)		23.0		23.0	
WATER TEMP (C)		23.0		23.0	
DISSOLVED OXYGEN (PPM)		8.6		8.6	
PH		8.6		8.6	
REPLICATE		A		B	
VOLUME SAMPLED (M ³)		35.83		33.89	
DENSITY		13.95		13.95	
MEAN DENSITY		19.06		19.02	
TAXA		N DENSITY		N DENSITY	
LARVAE					
DOPOSOMA CEPEDANUM	0	0.00	0.00	0.00	0.00
NOTEMIGONUS CRYSOLEUCAS	0	0.00	0.00	0.00	0.00
NOTROPIS SPILOPTERUS	0	0.00	0.00	0.00	0.00
NOTROPIS VOLUCELLUS	0	0.00	0.00	0.00	0.00
LEPOMIS GIBBOSUS PL. MACROCHIRUS	0	0.00	0.00	0.00	0.00
LEPOMIS GIBBOSUS PL. MACROCHIRUS	0	0.00	0.00	0.00	0.00
TOTAL LARVAE	0	0.00	0.00	0.00	0.00
YOUNG					
NOTROPIS SPILOPTERUS	3	8.37	3	8.85	3
NOTROPIS VOLUCELLUS	0	0.00	0.00	0.00	0.00
AMPHILOPTERUS SUPPLETUS	0	0.00	0.00	0.00	0.00
LEPOMIS GIBBOSUS PL. MACROCHIRUS	0	0.00	0.00	0.00	0.00
TOTAL YOUNG	3	8.37	3	8.85	3
TOTAL	3	8.37	3	8.85	3

TABLE 3.2-39

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 21 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		151							
STATION		TM-LF-1481		TM-LF-1581		TM-LF-161		TM-LF-1281	
TIME (DST)		11:00		11:30		11:40		08:40	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		23.0		23.0		23.0		23.0	
WATER TEMP (C)		23.0		23.0		23.0		23.0	
DISSOLVED OXYGEN (PPM)		8.6		8.6		8.6		8.6	
PH		8.6		8.6		8.6		8.6	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		34.02		32.78		34.63		34.50	
DENSITY		13.95		13.95		13.95		13.95	
MEAN DENSITY		3.02		0.00		2.89		2.90	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
LEPOMIS GIBBOSUS PL. MACROCHIRUS	1	2.98	0	0.00	0	0.00	0	0.00	0
TOTAL LARVAE	1	2.98	0	0.00	0	0.00	0	0.00	0
YOUNG									
NOTROPIS SPILOPTERUS	0	0.00	1	3.05	0	0.00	0	0.00	0
NOTROPIS VOLUCELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0
TOTAL YOUNG	0	0.00	1	3.05	0	0.00	0	0.00	0
TOTAL	1	2.98	1	3.05	0	0.00	0	0.00	0

TABLE 3.2-39 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 24 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		151							
STATION		TM-LF-12A1		TM-LF-13A1		TM-LF-13A2		TM-LF-16A1	
TIME (DST)		08:40		11:30		12:00		10:50	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		23.0		23.0		23.0		23.0	
WATER TEMP (C)		23.0		23.0		23.0		23.0	
DISSOLVED OXYGEN (PPM)		8.6		8.6		8.6		8.6	
PH		8.6		8.6		8.6		8.6	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		34.02		33.82		34.10		34.86	
DENSITY		13.95		13.95		13.95		13.95	
MEAN DENSITY		0.00		0.00		0.00		0.70	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE									
LEPOMIS GIBBOSUS PL. MACROCHIRUS	0	0.00	0	0.00	0	0.00	0	0.00	1
TOTAL LARVAE	0	0.00	0	0.00	0	0.00	0	0.00	1
YOUNG									
NOTROPIS SPILOPTERUS	0	0.00	0	0.00	0	0.00	0	0.00	0
NOTROPIS VOLUCELLUS	0	0.00	0	0.00	0	0.00	0	0.00	0
TOTAL YOUNG	0	0.00	0	0.00	0	0.00	0	0.00	0
TOTAL	0	0.00	0	0.00	0	0.00	0	0.00	1

TABLE 3.2-39 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 24 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		151							
STATION		TM-LF-10B1		TM-LF-10B2		TM-LF-10B3		TM-LF-10B1	
TIME (DST)		09:11		09:23		09:35		09:47	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		22.00		22.00		22.00		22.00	
WATER TEMP (C)		20.00		20.00		20.00		20.00	
DISSOLVED OXYGEN (PPM)		10.00		10.00		10.00		10.00	
PH		7.7		7.7		7.7		7.7	
SECCHI (CM)		1.0		1.0		1.0		1.0	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		31.98		34.40		33.00		31.54	
DENSITY		0.83		17.44		0.00		2.49	
MEAN DENSITY		13.14		0.00		0.00		1.50	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL LARVAE		0	0.00	0	0.00	0	0.00	0	0.00
YOUNG		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS		3	8.83	0	0.00	3	9.09	0	0.00
NOTROPIS VOLUCELLUS		0	0.00	0	0.00	0	0.00	1	2.49
TOTAL YOUNG		3	8.83	0	0.00	3	9.09	1	2.49
TOTAL		3	6	0	0	3	1	1	0

TABLE 3.2-39 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND DURING THE DAY ON 24 AUGUST 1982.

RIVER FLOW (M ³ /SEC)		151			
STATION		TM-LF-11A1		TM-LF-11A1	
TIME (DST)		10:07		10:17	
CURRENT VELOCITY (CM/SEC)		0.00		0.00	
AIR TEMP (C)		22.00		22.00	
WATER TEMP (C)		20.00		20.00	
DISSOLVED OXYGEN (PPM)		10.00		10.00	
PH		7.7		7.7	
SECCHI (CM)		1.0		1.0	
REPLICATE		A		B	
VOLUME SAMPLED (M ³)		33.12		32.16	
DENSITY		0.00		0.00	
MEAN DENSITY		0.00		0.00	
TAXA		N DENSITY		N DENSITY	
LARVAE		N DENSITY		N DENSITY	
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0.00	0	0.00
TOTAL LARVAE		0	0.00	0	0.00
YOUNG		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS		0	0.00	0	0.00
NOTROPIS VOLUCELLUS		0	0.00	0	0.00
TOTAL YOUNG		0	0.00	0	0.00
TOTAL		0	0	0	0

TABLE 3.2-40

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 24 AUGUST 1982.

RIVER FLOW (M ³ /S)		151							
STATION		TM-LF-11B1		TM-LF-11B1		TM-LF-11B1		TM-LF-11B1	
TIME (DST)		22:57		23:07		23:17		23:27	
CURRENT VELOCITY (CM/SEC)		0.00		0.00		0.00		0.00	
AIR TEMP (C)		22.00		22.00		22.00		22.00	
WATER TEMP (C)		20.00		20.00		20.00		20.00	
DISSOLVED OXYGEN (PPM)		10.00		10.00		10.00		10.00	
PH		7.7		7.7		7.7		7.7	
SECCHI (CM)		1.0		1.0		1.0		1.0	
REPLICATE		A		B		A		B	
VOLUME SAMPLED (M ³)		31.79		31.74		34.20		34.01	
DENSITY		7.50		63.01		0.00		2.60	
MEAN DENSITY		9.28		0.00		1.45		0.00	
TAXA		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
LARVAE		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS		18	56.83	17	53.55	0	0.00	1	2.90
NOTROPIS VOLUCELLUS		0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS		2	6.30	2	6.30	0	0.00	0	0.00
TOTAL LARVAE		20	63.13	19	59.85	0	0.00	1	2.90
YOUNG		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS		0	0.00	0	0.00	0	0.00	0	0.00
NOTROPIS VOLUCELLUS		0	0.00	0	0.00	0	0.00	0	0.00
ICHTALURUS PUNCTATUS		0	0.00	0	0.00	0	0.00	0	0.00
LEPOMIS GIBBOSUS/L. MACROCHIRUS		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL YOUNG		0	0.00	0	0.00	0	0.00	0	0.00
TOTAL		24	20	19	1	0	0	17	4

TABLE 3.2+40 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 24 AUGUST 1962.

RIVER FLOW (M ³ /SEC)		151							
STATION	TIME (DST)	TM-LF-12A1		TM-LF-12A1		TM-LF-12A2		TM-LF-12A1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	2.02		2.12		2.12		2.02	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	13.8		13.8		13.8		13.8	
PH	REPLICATE	A B		A B		A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	34.01 13.51		33.05 32.88		33.38 32.82		34.11 34.06	
MEAN DENSITY	TAXA	0.00 0.00		0.00 1.52		0.00 3.01		0.00 32.78	
LARVAE		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
NOTROPIS VOLUCELLUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
TOTAL LARVAE	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
YOUNG		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
NOTROPIS VOLUCELLUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
ICTALURIS PUNCTATUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
TOTAL YOUNG	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
TOTAL	0	0	0	1	2	0	14	8	8

TABLE 3.2+40 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 24 AUGUST 1962.

RIVER FLOW (M ³ /SEC)		151							
STATION	TIME (DST)	TM-LF-10B1		TM-LF-10B2		TM-LF-10B3		TM-LF-10B1	
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	2.02		2.02		2.02		2.02	
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	13.8		13.8		13.8		13.8	
PH	REPLICATE	A B		A B		A B		A B	
VOLUME SAMPLED (M ³)	DENSITY	35.80 34.95		33.72 33.35		33.09 32.78		33.98 34.31	
MEAN DENSITY	TAXA	5.66 5.72		2.16 2.20		19.68 19.15		2.95 0.00	
LARVAE		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS	1 0	2 0	2 0	5 0	6 0	8 0	1 0	1 0	0 0
NOTROPIS VOLUCELLUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
TOTAL LARVAE	1 0	2 0	2 0	5 0	6 0	8 0	1 0	1 0	0 0
YOUNG		N DENSITY		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS	1 0	2 0	2 0	9 0	2 0	1 0	3 0	1 0	0 0
NOTROPIS VOLUCELLUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
ICTALURIS PUNCTATUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
TOTAL YOUNG	1 0	2 0	2 0	9 0	2 0	1 0	3 0	1 0	0 0
TOTAL	2	2	2	71	75	10	1	2	0

TABLE 3.2+40 continued.

NUMBER (N) AND DENSITY (N/100M³) OF ICHTHYOPLANKTON TAKEN BY PUSH NET IN YORK HAVEN POND AT NIGHT ON 24 AUGUST 1962.

RIVER FLOW (M ³ /SEC)		151					
STATION	TIME (DST)	TM-LF-11A1		TM-LF-11A1			
CURRENT VELOCITY (CM/SEC)	AIR TEMP (C)	2.02		2.02			
WATER TEMP (C)	DISSOLVED OXYGEN (PPM)	13.8		13.8			
PH	REPLICATE	A B		A B			
VOLUME SAMPLED (M ³)	DENSITY	34.11 34.22		31.61 31.41			
MEAN DENSITY	TAXA	7.29 5.94		0.00 1.50			
LARVAE		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0
NOTROPIS VOLUCELLUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0
TOTAL LARVAE	0 0	0 0	0 0	0 0	0 0	0 0	0 0
YOUNG		N DENSITY		N DENSITY		N DENSITY	
NOTROPIS SPILOPTERUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0
NOTROPIS VOLUCELLUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0
ICTALURIS PUNCTATUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0 0	0 0	0 0	0 0	0 0	0 0	0 0
TOTAL YOUNG	0 0	0 0	0 0	0 0	0 0	0 0	0 0
TOTAL	3	2	0	1			

Table 3.2-41

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station 79-18-1481, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30		
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	7	10.58	34	42.93	2	2.85	1	1.74	-	-	1	1.40	-	-	
<i>Cyprinus carpio</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Notemigonus crysoleucas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Notropis amoena</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>N. anogenus/N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>N. hudsonius</i>	-	-	-	-	-	-	2	3.03	53	66.91	4	5.70	6	10.32	1	1.38	1	1.07	-	-	
<i>N. spilopterus</i>	NO	-	-	-	-	-	-	-	11	13.89	-	-	-	-	-	-	-	-	-	8	12.48
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pimephales notatus</i>	-	-	-	-	-	-	1	1.49	-	-	1	1.42	-	-	-	-	-	-	-	-	
<i>Rhinichthys atratulus</i>	-	-	-	-	-	-	-	-	-	1	1.42	-	-	-	-	-	-	-	-	-	
<i>Semotilus atromaculatus</i>	-	-	-	-	-	-	-	-	-	1	1.42	-	-	-	-	-	-	-	-	-	
<i>S. corporalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Cariacus cyprinus</i>	FISH	-	15	23.75	8	12.15	21	26.51	25	35.62	1	1.71	-	-	-	-	6	8.56	1	1.55	
<i>Catostomus commersoni</i>	1	1.54	1	1.58	11	16.71	3	3.79	1	1.42	-	-	-	-	-	-	-	-	-	-	
<i>Moxostoma macrolepidotus</i>	-	-	-	-	-	-	-	-	2	2.86	-	-	3	4.20	-	-	-	-	-	-	
<i>Ictalurus punctatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	4	5.05	3	4.27	-	-	-	-	-	-	-	-	-	-	
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>L. gibbosus/L. macrochirus</i>	TAKEN	-	-	-	-	-	11	13.89	-	-	-	-	-	-	-	-	-	-	15	23.56	
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	4	5.70	1	1.74	-	-	-	-	-	-	-	-	
<i>Pomoxis annularis</i>	-	-	-	-	-	-	-	-	3	4.27	-	-	-	-	-	-	-	-	-	-	
<i>Etheostoma olivaceum</i>	-	-	-	-	-	-	6	7.58	30	42.74	3	5.16	1	1.43	2	2.85	-	-	-	-	
<i>E. zonale</i>	5	7.68	-	-	1	1.49	3	3.79	1	1.42	-	-	-	-	-	-	-	-	-	-	
<i>Percina pelata</i>	-	10.74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Stizostedion v. vitreum</i>	-	-	16	25.33	30	45.46	146	186.33	78	111.12	12	20.67	-	-	7	7.02	10	16.22	24	37.59	
TOTAL	13	19.95	16	25.33	30	45.46	146	186.33	78	111.12	12	20.67	-	-	7	7.02	10	16.22	24	37.59	

Table 3.2-41 contim.cd.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%	
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density			
<i>Dorosoma cepedianum</i>	-	-	-	-	9	14.63	-	-	-	-	-	-	-	-	-	-	10	0.17	
<i>Cyprinus carpio</i>	-	-	-	-	2	3.21	2	3.39	-	-	-	-	-	-	-	-	48	0.80	
<i>Notemigonus crysoleucas</i>	1	1.55	5	6.55	15	8.30	4	6.78	5	7.62	3	4.96	1	1.32	-	-	36	0.57	
<i>Notropis amoena</i>	-	-	1	1.31	4	6.42	-	-	-	-	-	-	-	-	-	-	5	0.08	
<i>N. anogenus/N. volucellus</i>	-	-	-	-	4	6.60	-	-	-	-	-	-	-	-	-	-	4	0.07	
<i>N. hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67	1.12	
<i>N. spilopterus</i>	4	6.26	2	2.62	73	118.98	39	66.09	130	197.55	32	52.87	158	209.54	35	55.09	492	8.23	
<i>N. volucellus</i>	-	-	-	-	-	-	32	54.24	6	9.08	6	9.92	4	5.29	-	-	48	0.80	
<i>Pimephales notatus</i>	2	3.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.03	
<i>Rhinichthys atratulus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.02	
<i>Semotilus atromaculatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.02	
<i>S. corporalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77	1.29	
<i>Cariacus cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	0.28	
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.08	
<i>Moxostoma macrolepidotus</i>	-	-	2	2.62	-	-	-	-	-	-	-	-	-	-	-	-	2	0.03	
<i>Ictalurus punctatus</i>	-	-	4	5.24	4	6.56	-	-	-	-	-	2	2.64	-	-	-	17	0.28	
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	1	1.71	-	-	-	2	2.66	-	-	-	3	0.05	
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	28	43.71	369	483.37	3395	5527.40	1098	1759.91	153	232.51	29	47.92	29	38.45	9	14.16	5076	84.87	
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.04	
<i>Pomoxis annularis</i>	-	-	-	-	1	1.65	-	-	-	-	-	-	-	-	-	-	3	0.05	
<i>Etheostoma olivaceum</i>	-	-	1	1.31	-	-	1	1.68	-	-	-	-	-	-	-	-	44	0.74	
<i>E. zonale</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	0.17	
<i>Percina pelata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	0.12	
<i>Stizostedion v. vitreum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	35	54.62	384	503.02	3507	5709.65	1117	1893.80	294	446.76	70	112.67	196	259.91	44	69.25	5281		

Table 3.2-42

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-LF-1581, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30		
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	
<i>Cyprinus carpio</i>	-	-	-	-	-	-	4	5.51	1	1.31	-	-	-	-	-	-	-	-	3	4.52	
<i>Notropis hudsonius</i>	-	-	-	-	-	-	3	4.09	-	-	3	4.43	1	1.53	-	-	-	-	1	1.49	
<i>N. spilopterus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.53	
<i>Carpiodes cyprinus</i>	NO	-	-	-	9	12.84	10	13.73	11	14.08	5	7.39	-	-	-	-	-	12	17.95	-	-
<i>Catostomus commersoni</i>	-	-	-	-	1	1.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	2	2.96	3	4.70	1	1.63	-	-	-	-	
<i>Ictalurus punctatus</i>	FISH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>L. gibbosus/L. macrochirus</i>	TAKEN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Etheostoma olmstedii</i>	-	-	-	-	-	-	2	2.77	-	-	1	1.48	-	-	-	-	-	-	-	-	
<i>E. zonale</i>	-	-	-	-	14	19.98	4	5.41	17	21.88	8	11.83	3	4.65	-	-	-	3	4.49	-	-
<i>Percina peltata</i>	1	1.52	1	1.43	1	1.43	1	1.35	1	1.26	-	-	-	-	-	-	-	-	-	-	
TOTAL	1	1.52	25	35.68	24	32.87	30	38.53	19	28.09	7	10.88	1	1.63	15	22.44	5	7.55	-	-	

Table 3.2-42 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Cyprinus carpio</i>	-	-	-	-	3	4.80	-	-	-	-	-	-	-	-	-	-	11	6.04
<i>Notropis hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	4.40
<i>N. spilopterus</i>	3	4.48	4	6.31	13	20.57	1	1.80	2	2.96	-	-	4	5.69	1	1.45	29	15.93
<i>Carpiodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	25.82
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.55
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	3.30
<i>Ictalurus punctatus</i>	-	-	8	12.61	-	-	-	-	-	-	-	-	-	-	-	-	8	4.40
<i>Ambloplites rupestris</i>	-	-	2	3.15	2	3.13	-	-	1	1.47	-	-	-	-	-	-	5	2.75
<i>Lepomis auritus</i>	-	-	-	-	-	-	1	1.71	2	2.94	2	3.14	-	-	-	-	5	2.75
<i>L. gibbosus/L. macrochirus</i>	-	-	3	4.73	1	1.60	1	1.80	1	1.47	-	-	-	-	-	-	6	3.30
<i>Etheostoma olmstedii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1.65
<i>E. zonale</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49	26.92
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	2.20
TOTAL	3	4.48	17	26.80	19	30.09	3	5.30	6	8.85	2	3.14	4	5.69	1	1.45	182	

Table 3.2-43

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-LF-181, 27 April through 24 August 1987.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30	
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density
<i>Cyprinus carpio</i>	-	-	-	-	-	-	360	509.03	3	4.46	3	7.69	-	-	-	-	-	-	22	32.03
<i>Notropis amoemus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>N. amoemus/N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>N. hudsonius</i>	-	-	28	43.31	12	16.92	4	5.94	-	-	1	1.45	2	2.94	1	1.37	4	5.80	3	4.36
<i>N. spilopterus</i>	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carpiodes cyprinus</i>	-	-	13	20.11	19	26.87	18	26.74	-	-	4	5.80	7	10.32	6	8.12	4	5.76	-	-
<i>Catostomus commersoni</i>	-	-	1	1.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	1	1.49	-	-	2	2.90	2	2.95	-	-	-	-	-	-
<i>Ictalurus punctatus</i>	FISH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	3	4.46	-	-	-	-	-	-	-	-	-	-	-	-
<i>Etheostoma olivaceum</i>	TAKEN	4	8.02	19	29.39	11	15.49	2	2.97	-	-	1	1.45	-	-	-	-	2	2.92	-
<i>E. zonale</i>	-	-	4	6.19	2	2.83	11	16.34	-	-	-	-	-	-	3	4.09	3	4.46	-	-
<i>Percina peltata</i>	3	6.02	1	1.55	6	8.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stizostedion v. vitreum</i>	-	-	-	-	1	1.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	7	14.04	66	102.09	411	581.08	42	62.40	3	7.69	8	11.60	11	16.21	10	13.58	38	55.34	-	-

Table 3.2-43 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Cyprinus carpio</i>	3	4.32	10	15.25	-	-	-	-	-	-	-	-	-	-	-	-	401	55.46
<i>Notropis amoemus</i>	-	-	1	1.51	-	-	-	-	-	-	-	-	-	-	-	-	1	0.14
<i>N. amoemus/N. volucellus</i>	-	-	-	-	1	1.60	-	-	-	-	-	-	-	-	-	-	1	0.14
<i>N. hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	7.19
<i>N. spilopterus</i>	2	2.87	20	30.43	15	23.90	6	9.52	8	12.49	1	1.67	7	10.26	NO	62	8.58	
<i>Carpiodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	9.82
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.14
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.69
<i>Ictalurus punctatus</i>	-	-	6	9.10	10	15.87	-	-	-	-	-	-	-	-	-	-	16	2.21
<i>Ambloplites rupestris</i>	3	4.29	-	-	1	1.60	-	-	-	-	-	-	-	-	-	-	4	0.55
<i>Lepomis auritus</i>	-	-	-	-	1	1.60	-	-	-	-	-	-	-	-	-	-	1	0.14
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	7	11.18	-	-	-	-	-	-	-	-	-	-	10	1.38
<i>Etheostoma olivaceum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	5.39
<i>E. zonale</i>	7	10.05	16	24.35	1	1.58	-	-	-	-	-	-	-	-	-	-	47	6.50
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	1.38
<i>Stizostedion v. vitreum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.14
Unidentified	-	-	1	1.53	-	-	-	-	-	-	-	-	-	-	-	-	1	0.14
TOTAL	15	21.52	54	82.17	36	57.33	6	9.52	8	12.49	1	1.67	7	10.26	-	-	723	-

Table 3.2-44

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-1F-12A1, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30	
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	6	7.66	22	27.30	-	-	-	-	-	-	-	-	2	3.09
<i>Cyprinus carpio</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.54
<i>Notropis amoemus/N. volucellus</i>	-	-	-	-	-	-	9	11.39	6	7.44	1	1.38	2	3.12	-	-	6	8.24	-	-
<i>N. hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	2	3.12	-	-	-	-	-	4	6.07
<i>N. spilopterus</i>	-	-	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Rhinichthys atratulus</i>	-	-	2	2.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carpiodes cyprinus</i>	-	-	4	5.70	8	10.15	10	12.41	8	11.03	-	-	1	1.54	10	13.74	-	-	-	-
<i>Catostomus commersoni</i>	-	-	3	4.23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Hypentelium nigricans</i>	-	-	FISH	-	1	1.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	3	4.14	2	3.15	5	7.74	-	-	-	-	-
<i>Ictalurus punctatus</i>	-	-	-	-	-	-	-	1	1.24	-	-	-	-	-	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	-	-	TAKEN	-	-	-	-	24	29.78	-	-	-	-	-	-	-	-	-	3	12.09
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	-	1	1.58	-	-	-	-	-	-	-
<i>Etheostoma olmetedi</i>	-	-	8	11.37	6	7.62	-	-	-	-	2	3.15	-	-	-	-	-	-	1	1.49
<i>E. zonale</i>	-	-	-	-	3	3.85	3	3.72	3	4.14	-	-	-	-	-	-	-	-	-	-
<i>Percina peltata</i>	1	1.46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Stizostedion v. vitreum</i>	1	1.49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	2	2.95	-	-	17	24.14	33	41.92	66	81.89	15	20.68	9	14.13	6	9.28	17	23.36	16	24.28

Table 3.2-44 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Dorosoma cepedianum</i>	-	-	-	-	2	3.34	-	-	-	-	-	-	-	-	-	-	2	0.35
<i>Cyprinus carpio</i>	-	-	-	-	2	3.33	-	-	-	-	-	-	-	-	-	-	32	5.60
<i>Notropis amoemus/N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.18
<i>N. hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	4.20
<i>N. spilopterus</i>	6	8.03	2	3.09	2	3.33	3	4.63	2	3.01	4	6.36	28	38.59	22	31.40	75	13.13
<i>N. volucellus</i>	1	1.52	-	-	3	5.01	-	-	-	-	-	-	-	2	2.85	-	6	1.05
<i>Rhinichthys atratulus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.35
<i>Carpiodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41	7.38
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.53
<i>Hypentelium nigricans</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.18
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	1.75
<i>Ictalurus punctatus</i>	-	-	8	12.37	-	-	-	-	-	-	-	-	-	-	-	-	8	1.40
<i>Ambloplites rupestris</i>	1	1.52	1	1.55	2	3.33	-	-	-	-	-	-	-	-	-	-	5	0.88
<i>Lepomis auritus</i>	1	1.52	-	-	-	-	-	-	1	1.50	-	-	1	1.37	-	-	3	0.53
<i>L. gibbosus/L. macrochirus</i>	8	12.08	82	126.70	92	153.39	102	157.32	8	12.04	1	1.59	1	1.37	2	2.86	328	57.44
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.18
<i>Etheostoma olmetedi</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	2.98
<i>E. zonale</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	1.75
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.18
<i>Stizostedion v. vitreum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.18
TOTAL	17	25.67	73	143.71	103	171.74	105	161.95	11	16.56	5	7.95	30	41.34	26	37.11	571	

Table 3.2-45

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-LF-12A1, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30	
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density
<i>Camptostoma anomalum</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	1.35	-	-	-	-	-	-
<i>Cyprinus carpio</i>	-	-	-	-	-	-	2	2.72	-	-	-	-	-	-	-	-	-	-	3	4.41
<i>Notropis hudsonius</i>	1	1.44	4	5.65	31	42.01	-	-	-	-	1	1.54	-	-	2	2.50	-	-	-	-
<i>N. spilopterus</i>	NO	-	-	-	-	-	-	-	-	-	-	-	NO	1	1.38	-	-	-	5	7.30
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carpionodes cyprinus</i>	-	-	11	15.53	1	1.37	11	13.86	11	16.97	-	-	5	6.84	16	19.62	-	-	-	-
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	20	30.86	-	-	1	1.21	-	-	-	-
<i>Ictalurus punctatus</i>	FISH	-	-	-	-	-	-	-	-	-	-	-	FISH	-	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	-	-	-	-	-	-	TAKEN	-	-	-	-	-	-	-
<i>Micropterus dolomieu</i>	TAKEN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Etheostoma olmstedii</i>	-	-	15	21.18	49	66.49	4	4.97	1	1.54	1	1.54	-	-	1	1.21	2	2.89	-	-
<i>E. zonale</i>	-	-	1	1.41	-	-	-	-	-	-	-	-	-	-	2	2.50	-	-	-	-
<i>Percina peltata</i>	2	2.88	-	-	1	1.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	3	4.32	31	43.77	84	113.93	15	18.82	34	52.46	-	-	7	9.56	22	27.04	10	14.60	-	-

Table 3.2-45 continued.

	Jul 5		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density		
<i>Camptostoma anomalum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.24
<i>Cyprinus carpio</i>	-	-	1	1.51	1	1.59	-	-	-	-	-	-	-	-	-	-	7	1.65
<i>Notropis hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	9.20
<i>N. spilopterus</i>	4	5.94	5	7.55	4	6.36	12	17.26	6	8.79	49	70.79	92	118.82	NO	178	41.98	
<i>N. volucellus</i>	-	-	-	-	6	9.55	-	-	-	-	-	-	3	3.88	-	-	9	2.12
<i>Carpionodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	12.97
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	4.95
<i>Ictalurus punctatus</i>	-	-	4	6.06	1	1.59	-	-	-	-	-	-	-	-	FISH	5	1.18	
<i>Ambloplites rupestris</i>	1	1.48	1	1.52	2	3.18	-	-	-	-	-	-	-	-	-	-	4	0.96
<i>Lepomis auritus</i>	1	1.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.24
<i>L. gibbosus/L. macrochirus</i>	-	-	3	4.53	9	14.32	1	1.44	-	-	3	4.33	-	-	-	-	16	3.77
<i>Micropterus dolomieu</i>	1	1.48	-	-	-	-	-	-	-	-	-	-	-	-	TAKEN	1	0.24	
<i>Etheostoma olmstedii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	16.98
<i>E. zonale</i>	8	11.82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	2.83
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.71
TOTAL	15	22.19	14	21.17	23	36.56	13	18.70	6	8.79	52	75.12	95	122.70	-	-	424	-

Table 3.2-46

Numbers (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-LF-13A1, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30		
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	
<i>Cyprinus carpio</i>							129	192.46											3	4.33	
<i>Notropis amoemus</i> / <i>N. volucellus</i>																				1	1.45
<i>N. hudsonius</i>					2	2.91	1	1.49			3	4.10	1	1.57						1	1.45
<i>N. spilopterus</i>	NO		NO																	1	1.45
<i>N. volucellus</i>																					
<i>Carpionides cyprinus</i>					2	2.91	3	4.48	17	22.75	16	21.89	3	4.66	10	15.29	10	15.06			
<i>Moxostoma macrolepidotum</i>							1	1.49			12	16.61	2	3.05							
<i>Ictalurus punctatus</i>	FISH		FISH																		
<i>Ambloplites rupestris</i>																					
<i>Lepomis auritus</i>																					
<i>L. gibbosus</i> / <i>L. macrochirus</i>																					
<i>Micropterus dolomieu</i>	TAKEN		TAKEN						1	1.35											
<i>Pomoxis nigromaculatus</i>									1	1.32											
<i>Etheostoma olmstedii</i>					7	10.20	4	5.95	1	1.32	6	8.21	1	1.52						2	2.91
<i>E. zonale</i>					2	2.91			3	4.02	3	4.10	2	3.14						2	2.91
TOTAL					13	18.94	138	205.86	23	30.76	40	54.72	9	13.95	10	15.29	10	15.06	10	14.50	

Table 3.2-46 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Cyprinus carpio</i>			3	4.53			1	1.69									136	46.76
<i>Notropis amoemus</i> / <i>N. volucellus</i>																	1	0.34
<i>N. hudsonius</i>																	8	2.75
<i>N. spilopterus</i>	1	1.43	3	4.54	2	3.16					3	4.54	8	11.06	1	1.52	19	6.53
<i>N. volucellus</i>												1	1.38				1	0.34
<i>Carpionides cyprinus</i>																	61	20.96
<i>Moxostoma macrolepidotum</i>																	15	5.15
<i>Ictalurus punctatus</i>	1	1.45	3	4.53													4	1.37
<i>Ambloplites rupestris</i>			2	3.02													2	0.69
<i>Lepomis auritus</i>											3	4.54					3	1.03
<i>L. gibbosus</i> / <i>L. macrochirus</i>					3	4.74			2	3.07							5	1.72
<i>Micropterus dolomieu</i>																	1	0.34
<i>Pomoxis nigromaculatus</i>																	1	0.34
<i>Etheostoma olmstedii</i>																	21	7.22
<i>E. zonale</i>			1	1.51													13	4.47
TOTAL	2	2.88	12	18.14	5	7.90	1	1.69	2	3.07	6	9.09	9	12.43	1	1.52	291	

Table 3.2-47

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station 01-U-13A2, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30	
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density
<i>Dorosoma cepedianum</i>	-	-	-	-	-	23	31.74	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cyprinus carpio</i>	-	-	-	-	-	501	414.70	19	23.06	3	4.30	-	-	-	-	-	-	-	5	7.78
<i>Notropis anogenus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.53
<i>N. anogenus/N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	7.75
<i>N. hudsonius</i>	-	-	78	122.79	46	63.51	15	18.21	23	32.57	1	1.56	-	-	22	17.78	1	1.56	1	1.56
<i>N. spilopterus</i>	NO	-	-	-	-	-	-	4	4.86	1	1.43	1	1.56	-	3	1.33	5	7.75	-	-
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Notropis corporalis</i>	-	-	-	-	1	1.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carniodes cyprinus</i>	-	-	10	15.74	38	52.32	26	31.56	128	183.61	3	4.61	16	23.73	22	31.72	1	1.53	-	-
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	1	1.43	-	-	-	-	-	-	-	-	-	-
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	9	12.91	1	1.52	-	-	-	-	-	-	-	-
<i>Ictalurus natalis</i>	FISH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>I. punctatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	1	1.21	-	-	-	-	-	-	-	-	-	-	-
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. macrochirus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	3	3.84	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pomoxis</i> spp.	TAKEN	-	-	-	1	1.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Etheostoma olivaceum</i>	-	-	5	7.87	2	2.76	3	3.64	7	10.06	-	-	-	-	-	-	-	-	-	-
<i>E. zonale</i>	-	-	1	1.57	3	4.12	4	4.86	48	68.85	2	3.13	5	7.43	1	1.53	13	20.15	-	-
<i>Percina pelata</i>	3	4.69	3	4.32	-	-	-	-	1	1.43	-	-	-	-	-	-	-	-	-	-
<i>Stizostedion v. vitreum</i>	-	-	1	1.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	3	4.69	98	154.27	615	571.90	75	91.04	271	317.02	8	12.39	21	31.16	36	52.34	31	48.05	-	-

Table 3.2-47 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Dorosoma cepedianum</i>	-	-	1	1.48	-	-	-	-	-	-	-	-	-	-	-	-	24	2.75
<i>Cyprinus carpio</i>	1	1.43	1	1.48	2	2.94	-	-	-	-	-	-	-	-	-	-	332	31.06
<i>Notropis anogenus</i>	-	-	3	4.68	-	-	-	-	-	-	-	-	-	-	-	-	4	0.37
<i>N. anogenus/N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.47
<i>N. hudsonius</i>	1	1.39	1	1.48	-	-	-	-	-	-	-	-	-	-	-	-	178	16.65
<i>N. spilopterus</i>	6	8.44	2	2.98	4	5.91	5	8.13	12	16.85	9	12.90	10	14.00	2	3.01	62	5.80
<i>N. volucellus</i>	-	-	-	-	2	2.94	4	6.53	-	-	-	-	-	-	-	-	6	0.56
<i>Notropis corporalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.09
<i>Carniodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	22.83
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.09
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	0.94
<i>Ictalurus natalis</i>	-	-	-	-	-	-	-	1	1.39	-	-	-	-	-	-	-	1	0.09
<i>I. punctatus</i>	-	-	22	40.21	-	-	-	-	-	-	-	-	-	-	-	-	27	2.53
<i>Ambloplites rupestris</i>	-	-	-	-	-	1	1.60	1	1.41	-	-	-	-	-	-	-	3	0.28
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	1	1.43	-	-	-	-	-	-	1	0.09
<i>L. macrochirus</i>	-	-	-	-	-	-	-	-	2	2.88	-	-	-	-	-	-	2	0.19
<i>L. gibbosus/L. macrochirus</i>	-	-	15	22.26	14	20.61	22	35.71	5	6.99	2	2.87	-	-	-	-	61	5.71
<i>Pomoxis</i> spp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.09
<i>Etheostoma olivaceum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	1.59
<i>E. zonale</i>	4	5.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81	7.58
<i>Percina pelata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	0.65
<i>Stizostedion v. vitreum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.09
TOTAL	7	16.93	50	75.36	22	32.42	32	51.96	19	26.64	14	20.07	10	14.00	2	3.01	1069	

Table 3.2-48

Number (n), mean density (n/100 m³), and percent composition (%) of Ichthyoplankton taken at night by push net at Station IM-18-4A1, 27 April through 24 August 1982.

	Apr	May	May	May	May	Jun	Jun	Jun	Jun	Jun						
	27	4	11	18	25	2	10	15	22-23	30						
	n	n	n	n	n	n	n	n	n	n						
<i>Dorosoma cepedianum</i>				18	26.38											
<i>Cyprinus carpio</i>				85	124.67	39	55.73	6	8.11	7	10.84					
<i>Notemigonus crysoleucas</i>																
<i>Notropis anogenus</i>																
<i>N. hudsonius</i>			3	4.37	2	2.98	1	1.35		1	1.54					
<i>N. spilopterus</i>		NO				8	8.57			3	4.43					
<i>N. volucellus</i>																
<i>Stenichthys cataractae</i>							1	1.35								
<i>Carpionoxys cyprinus</i>			3	4.37	23	33.77	23	32.86	9	12.17						
<i>Catostomus commersoni</i>				1	1.49			1	1.35							
<i>Hoxostoma macrolepidotus</i>		FISH				1	1.43	6	8.11							
<i>Ambloplites rupestris</i>																
<i>Lepomis gibbosus</i>																
<i>L. macrochirus</i>						1	1.43									
<i>L. gibbosus/L. macrochirus</i>				1	1.49	58	82.88			5	7.71					
<i>Micropterus dolomieu</i>																
<i>Pomoxis annularis</i>		TAKEN														
<i>P. nigromaculatus</i>																
<i>Etheostoma olivaceum</i>			2	2.91	3	4.37	1	1.43	3	4.06						
<i>E. zonale</i>			1	1.46			2	2.86	6	5.41						
<i>Percina pelata</i>			1	1.46	1	1.44	1	1.43								
TOTAL			10	14.57	134	196.54	136	171.67	30	40.57	1	1.58	8	11.49	17	26.27

Table 3.2-48 continued.

	Jul	Jul	Jul	Jul	Aug	Aug	Aug	Aug	Total	%							
	5	13	20	27	3	10	16	25									
	n	n	n	n	n	n	n	n									
<i>Dorosoma cepedianum</i>			3	5.21			1	1.35	27	1.30							
<i>Cyprinus carpio</i>			1	1.71					138	8.14							
<i>Notemigonus crysoleucas</i>		1	1.60						1	0.06							
<i>Notropis anogenus</i>		1	1.60						1	0.06							
<i>N. hudsonius</i>			1	1.71					9	0.53							
<i>N. spilopterus</i>	1	1.40	4	6.44	11	18.93	3	5.34	62	97.54							
<i>N. volucellus</i>					2	3.58	1	1.54	11	17.91							
<i>Stenichthys cataractae</i>									2	2.69							
<i>Carpionoxys cyprinus</i>																	
<i>Catostomus commersoni</i>																	
<i>Hoxostoma macrolepidotus</i>																	
<i>Ambloplites rupestris</i>			1	1.71													
<i>Lepomis gibbosus</i>							1	1.54	1	1							
<i>L. macrochirus</i>																	
<i>L. gibbosus/L. macrochirus</i>			757	1219.54	284	489.93	121	216.40	4	5.49							
<i>Micropterus dolomieu</i>									38	59.78							
<i>Pomoxis annularis</i>									4	5.41							
<i>P. nigromaculatus</i>									1	1.35							
<i>Etheostoma olivaceum</i>																	
<i>E. zonale</i>																	
<i>Percina pelata</i>																	
TOTAL	1	1.40	763	1228.99	304	523.77	126	225.32	10	15.18	112	176.20	20	26.97	22	32.78	1692

Table 3.2-49

Number (n), mean density (n/100 m³), and percent composition (%) of Ichthyoplankton taken at night by push net at Station TM-12-1061, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30		
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cyprinus carpio</i>	-	-	-	-	7	8.91	3	4.17	-	-	-	-	-	-	-	-	-	-	6	8.75	-
<i>Notropis hudsonius</i>	-	-	1	1.49	4	5.13	2	2.78	1	1.41	1	1.55	-	-	-	-	-	-	-	-	-
<i>N. spilopterus</i>	-	-	-	-	4	5.06	1	1.39	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H. volucellus</i>	-	-	-	-	-	-	1	1.39	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carpionodes cyprinus</i>	-	-	1	1.49	7	8.91	1	1.39	5	12.69	-	-	-	-	-	-	3	4.44	-	-	-
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	4	1.41	2	3.15	-	-	-	-	-	-	-	-	-
<i>Ictalurus punctatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	1	1.41	-	-	-	-	-	-	-	-	-	-	-
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	16.03	-
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	1	1.39	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pomoxis nigromaculatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Etheostoma olmstedii</i>	-	-	-	-	-	-	-	-	3	4.23	-	-	-	-	-	-	-	-	-	-	-
<i>E. zonale</i>	-	-	-	-	-	-	-	-	3	4.23	1	1.55	-	-	-	-	-	-	-	-	-
TOTAL	-	-	2	2.98	22	28.01	9	12.51	18	25.38	4	6.25	-	-	-	-	3	4.44	17	24.78	-

Table 3.2-49 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Dorosoma cepedianum</i>	-	-	-	-	1	1.55	-	-	-	-	-	-	-	-	-	-	1	0.33
<i>Cyprinus carpio</i>	-	-	-	-	3	4.62	1	1.80	-	-	-	-	-	-	-	-	20	6.76
<i>Notropis hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	2.95
<i>N. spilopterus</i>	1	1.56	2	3.04	1	1.55	5	9.01	-	-	2	2.91	11	15.23	4	5.69	31	10.15
<i>H. volucellus</i>	-	-	-	-	-	-	1	1.80	-	-	-	-	3	4.15	-	-	5	1.66
<i>Carpionodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	6.89
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.93
<i>Ictalurus punctatus</i>	-	-	2	3.04	-	-	-	-	-	-	-	-	-	-	-	-	2	0.66
<i>Ambloplites rupestris</i>	-	-	-	-	2	3.07	-	-	-	-	-	-	-	-	-	-	3	0.98
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	1	1.54	-	-	-	-	-	-	1	0.33
<i>L. gibbosus/L. macrochirus</i>	-	-	63	95.66	52	79.88	64	115.18	4	6.07	5	7.27	1	1.38	-	-	200	65.57
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.35
<i>Pomoxis nigromaculatus</i>	-	-	-	-	1	1.55	-	-	-	-	-	-	-	-	-	-	1	0.33
<i>Etheostoma olmstedii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.98
<i>E. zonale</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	1.31
TOTAL	1	1.56	67	101.74	60	92.23	71	127.78	5	7.61	7	10.17	15	20.75	4	5.69	305	

Table 3.2-50

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-LF-10B2, 27 April through August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30		
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.56
<i>Cyprinus carpio</i>	-	-	-	-	110	152.55	33	41.59	-	-	-	-	-	-	-	-	-	-	-	194	298.90
<i>Notemigonus crysoleucas</i>	-	-	-	-	-	-	1	1.26	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Notropis amoemus/N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.52
<i>N. hudsonius</i>	NO	-	6	8.37	49	67.83	7	8.82	4	5.95	1	1.51	-	-	-	-	-	-	-	-	-
<i>N. spilopterus</i>	-	-	-	-	-	-	-	-	1	1.49	-	-	2	2.67	-	-	-	-	-	17	26.23
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carpodes cyprinus</i>	3	4.16	12	16.60	18	22.69	13	19.33	3	4	-	-	17.34	17	24.41	1	1.52	-	-	-	-
<i>Catostomus commersoni</i>	2	2.79	-	-	-	-	-	-	1	1.49	-	-	-	-	-	-	-	-	-	-	-
<i>Moxostoma macrolepidotum</i>	FISH	-	-	-	-	-	2	2.52	32	47.58	3	-	-	3.99	-	-	-	-	-	-	-
<i>Ictalurus punctatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	1	1.26	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	-	-	2	2.97	1	1.51	1	1.35	-	-	-	-	-	-	-
<i>Micropterus dolomieu</i>	TAKEN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.43	-	-	-
<i>Etheostoma olmstedii</i>	3	4.18	3	4.17	2	2.52	5	7.43	5	7.56	-	-	-	3	3.99	1	1.44	-	-	-	-
<i>E. zonale</i>	-	-	-	-	-	-	2	2.52	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Percina peltata</i>	4	5.58	3	4.17	2	2.52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	18	25.11	177	245.32	68	85.70	58	86.24	13	19.65	22	29.34	19	27.27	214	329.73	-	-	-	-	-

Table 3.2-50 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.09
<i>Cyprinus carpio</i>	-	-	2	2.94	-	-	4	6.24	-	-	-	-	-	-	-	-	343	31.67
<i>Notemigonus crysoleucas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.09
<i>Notropis amoemus/N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.09
<i>N. hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67	6.19
<i>N. spilopterus</i>	7	10.85	9	13.23	11	16.80	4	6.24	16	26.04	56	87.94	97	129.60	140	207.32	360	33.24
<i>N. volucellus</i>	-	-	-	-	5	7.54	1	1.56	-	-	-	-	11	14.68	5	7.38	22	2.03
<i>Carpodes cyprinus</i>	1	1.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	81	7.48
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.28
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	3.69
<i>Ictalurus punctatus</i>	-	-	2	2.94	-	-	-	-	-	-	-	-	-	-	1	1.50	3	0.23
<i>Ambloplites rupestris</i>	1	1.53	1	1.49	1	1.55	-	-	-	-	-	-	-	-	-	-	4	0.37
<i>Lepomis auritus</i>	1	1.56	-	-	1	1.55	-	-	-	-	2	3.14	-	-	-	-	4	0.37
<i>L. gibbosus/L. macrochirus</i>	-	-	4	5.91	48	73.51	37	57.78	8	13.02	16	25.13	1	1.33	-	-	114	10.53
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	0.37
<i>Etheostoma olmstedii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	1.75
<i>E. zonale</i>	1	1.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	0.65
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	0.83
TOTAL	11	17.05	18	26.50	66	100.95	46	71.81	24	39.06	74	116.20	109	145.61	146	216.70	1083	-

Table 3.2-51

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-1F-10B3, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30	
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density
<i>Cyprinus carpio</i>	-	-	1	1.31	133	188.81	5	6.35	-	-	-	-	-	-	-	-	-	-	22	33.14
<i>Notropis anogenus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.54
<i>N. hudsonius</i>	-	-	6	7.86	42	59.58	4	5.08	6	7.79	1	1.53	1	1.51	1	1.91	-	-	4	6.03
<i>N. spilopterus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carpiodes cyprinus</i>	-	-	4	5.24	5	7.14	12	15.23	13	16.88	3	4.58	6	8.07	10	19.13	-	-	-	-
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	40	51.94	2	3.03	1	1.51	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	1	1.30	-	-	-	-	-	-	-	-	-	-
<i>Lepomis auritus</i>	-	-	-	-	-	-	2	2.54	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	-	-	1	1.30	-	-	-	-	-	-	-	-	9	13.55
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	6	7.79	4	6.12	-	-	-	-	-	-	-	-
<i>Etheostoma olmstedii</i>	-	-	3	3.93	3	4.27	1	1.27	-	-	-	-	-	-	-	-	-	-	-	-
<i>E. zonale</i>	-	-	-	-	1	1.41	1	1.27	-	-	-	-	-	-	-	-	-	-	-	-
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	-	-	14	18.33	184	261.21	25	31.73	67	87.00	10	15.27	8	12.10	11	21.04	36	54.26	-	-

Table 3.2-51 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Cyprinus carpio</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	161	28.15
<i>Notropis anogenus</i>	1	1.58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.35
<i>N. hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61	10.66
<i>N. spilopterus</i>	1	1.58	6	9.15	10	16.00	3	5.09	11	16.52	29	46.38	21	31.29	11	16.65	96	16.78
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	2	3.20	-	-	2	3.04	4	0.70
<i>Carpiodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53	9.27
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43	7.52
<i>Ambloplites rupestris</i>	-	-	-	-	1	1.59	-	-	-	-	1	1.60	-	-	-	-	3	0.52
<i>Lepomis auritus</i>	-	-	-	-	-	-	-	-	-	2	3.20	-	-	-	-	-	2	0.35
<i>L. gibbosus/L. macrochirus</i>	1	1.58	54	82.22	10	15.97	34	57.74	9	13.50	7	11.20	-	-	-	-	126	22.03
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.17
<i>Etheostoma olmstedii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	2.97
<i>E. zonale</i>	1	1.58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.17
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.35
TOTAL	4	6.33	60	91.37	21	33.56	37	62.83	20	30.03	41	65.58	21	31.29	13	19.68	572	

Table 3.2-52

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-LF-981, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30	
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	4	5.41	-	-	-	-	-	-	-	-	-	-	1	1.47
<i>Cyprinus carpio</i>	-	-	-	-	-	-	567	760.89	5	6.33	-	-	-	-	-	-	-	-	160	238.66
<i>Notropis hudsonius</i>	-	-	-	-	38	56.10	65	87.15	2	2.53	2	3.16	-	-	-	-	-	-	-	-
<i>N. spilopterus</i>	-	-	-	-	-	-	-	-	-	-	1	1.58	-	-	-	-	-	-	7	10.41
<i>N. volucellus</i>	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carpiodes cyprinus</i>	-	-	-	-	6	8.86	16	21.56	45	57.00	85	134.32	1	1.44	9	12.99	37	51.97	1	1.47
<i>Catostomus commersoni</i>	1	1.41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	6	9.48	1	1.44	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	1	1.27	-	-	-	-	-	-	-	-	-	-
<i>Lepomis auritus</i>	FISH	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. macrochirus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	-	-	2	2.53	-	-	-	-	-	-	-	-	-	-
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	1	1.58	-	-	-	-	-	-	-	-
<i>M. salmoides</i>	-	-	-	-	-	-	-	-	-	-	1	1.58	-	-	-	-	-	-	-	-
<i>Etheostoma olmstedii</i>	TAKEN	-	-	1	1.48	8	10.78	14	17.73	2	3.16	1	1.45	1	1.43	-	-	-	1	1.51
<i>E. zonale</i>	-	-	-	-	-	-	-	16	20.27	16	25.28	-	-	-	-	-	1	1.37	1	1.47
<i>Percina peltata</i>	-	-	1	1.48	1	1.32	1	1.27	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL			1	1.41	46	67.91	661	887.11	86	108.93	114	180.44	3	4.34	10	14.63	38	53.34	171	256.79

Table 3.2-52 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.38
<i>Cyprinus carpio</i>	-	-	14	19.73	-	-	-	-	-	-	-	-	-	-	-	-	746	57.25
<i>Notropis hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	107	8.21
<i>N. spilopterus</i>	1	1.48	6	8.42	2	3.21	3	4.65	4	5.94	102	151.35	13	17.34	2	2.95	141	10.82
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	1	1.48	-	-	-	-	1	0.08
<i>Carpiodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	15.35
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.08
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	0.54
<i>Ambloplites rupestris</i>	-	-	1	1.43	3	4.90	-	-	-	-	-	-	-	-	-	-	5	0.38
<i>Lepomis auritus</i>	-	-	-	-	1	1.61	-	-	-	-	-	-	-	-	-	-	1	0.08
<i>L. macrochirus</i>	-	-	-	-	-	-	-	-	-	1	1.48	-	-	-	-	-	1	0.08
<i>L. gibbosus/L. macrochirus</i>	-	-	1	1.39	1	1.61	8	12.41	2	2.96	5	7.42	-	-	-	-	19	1.46
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.08
<i>M. salmoides</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.08
<i>Etheostoma olmstedii</i>	1	1.48	1	1.39	-	-	-	-	-	-	-	-	-	-	-	-	30	2.30
<i>E. zonale</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	2.61
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.23
TOTAL	2	2.96	23	32.36	7	11.33	11	17.05	6	8.90	109	161.74	13	17.34	2	2.95	1303	

Table 3.2-53

Number (n), mean density (n/100 m³), and percent composition (%) of Ichthyoplankton taken at night by push net at Station TN-LF-11A1, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30			
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density		
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	7	8.86	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Cyprinus carpio</i>	-	-	-	-	-	-	254	321.67	20	25.37	1	1.27	-	-	-	-	-	-	-	40	58.08	
<i>Notropis anogenus</i> / <i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1.43	
<i>N. hudsonius</i>	-	-	-	-	91	124.16	61	77.55	22	27.78	3	3.80	-	-	-	-	-	-	5	7.31	9	13.14
<i>N. spilopterus</i>	NO	-	-	-	-	-	-	-	1	1.28	1	1.27	-	-	-	-	-	-	-	-	4	5.76
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Semotilus corporalis</i>	-	-	-	-	-	-	1	1.26	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Cariodes cyprinus</i>	-	-	-	-	9	12.28	31	39.23	53	67.06	97	122.95	2	3.03	5	7.36	10	14.57	1	1.47	-	
<i>Catostomus commersoni</i>	1	1.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Moxostoma macrolepidotum</i>	FISH	-	-	-	-	-	-	-	-	-	8	10.14	1	1.49	-	-	-	-	-	-	-	
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Lepomis macrochirus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>L. gibbosus</i> / <i>L. macrochirus</i>	-	-	-	-	-	-	-	-	2	2.56	-	-	-	-	-	-	-	-	-	-	-	
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	1	1.27	-	-	-	-	-	-	-	-	-	
<i>Etheostoma olmstedii</i>	TAKEN	-	-	2	2.73	4	5.11	7	8.87	5	6.34	-	-	-	-	-	-	-	-	1	1.43	
<i>E. zonale</i>	-	-	-	6	8.19	1	1.28	29	36.62	35	44.36	-	-	-	-	-	-	-	-	1	1.47	
<i>Percina peltata</i>	-	-	1	1.36	2	2.73	1	1.26	1	1.28	-	-	-	-	-	-	-	-	-	-	-	
TOTAL		2	2.72	110	150.08	360	465.21	135	170.84	151	191.39	3	4.52	5	7.36	15	21.88	57	82.77			

Table 3.2-53 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Dorosoma cepedianum</i>	-	-	-	-	1	1.57	-	-	-	-	-	-	-	-	-	-	8	0.82
<i>Cyprinus carpio</i>	1	1.51	3	4.35	2	3.13	-	-	-	-	-	-	-	-	-	-	321	32.96
<i>Notropis anogenus</i> / <i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.10
<i>N. hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	191	19.61
<i>N. spilopterus</i>	2	3.04	2	2.89	4	6.26	16	23.57	17	26.01	19	29.97	12	16.85	1	1.46	79	8.11
<i>N. volucellus</i>	-	-	2	2.89	1	1.57	1	1.47	-	-	1	1.58	2	2.80	3	4.37	10	1.03
<i>Semotilus corporalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.10
<i>Cariodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	208	21.35
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.10
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	0.92
<i>Ambloplites rupestris</i>	-	-	1	1.46	1	1.57	1	1.47	1	1.52	-	-	-	-	-	-	4	0.41
<i>Lepomis macrochirus</i>	-	-	-	-	-	-	-	-	-	-	1	1.58	-	-	-	-	1	0.10
<i>L. gibbosus</i> / <i>L. macrochirus</i>	-	-	3	4.32	14	21.89	16	23.57	1	1.54	2	3.16	-	-	1	1.46	39	4.00
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.10
<i>Etheostoma olmstedii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	1.95
<i>E. zonale</i>	3	4.55	1	1.43	-	-	-	-	-	-	-	-	-	-	-	-	76	7.80
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.51
TOTAL		6	9.10	12	17.34	23	36.00	34	50.08	19	29.07	23	36.28	14	19.66	5	974	

Table 3.2-54

Number (n), mean density (n/100 m³), and percent composition (%) of ichthyoplankton taken at night by push net at Station TM-1F-16A1, 27 April through 24 August 1982.

	Apr 27		May 4		May 11		May 18		May 25		Jun 2		Jun 10		Jun 15		Jun 22-23		Jun 30		
	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	n	density	
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	19	25.35	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cyprinus carpio</i>	-	-	-	-	338	451.94	48	60.74	-	-	-	-	-	-	-	-	-	-	51	66.61	
<i>Notropis anogenus</i>	-	-	-	-	-	-	-	-	1	1.52	-	-	-	-	-	-	-	-	-	-	
<i>N. hudsonius</i>	-	-	36	54.10	56	74.74	7	8.72	3	4.56	-	-	-	-	-	-	1	1.35	8	10.49	
<i>N. spilopterus</i>	-	-	NO	-	-	-	-	-	1	1.29	-	-	-	-	-	-	-	-	3	3.96	
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Carpiodes cyprinus</i>	-	-	9	13.52	33	44.28	25	31.63	26	39.00	1	1.46	6	8.84	5	6.60	2	2.58	-	-	
<i>Catostomus commersoni</i>	-	-	1	1.50	-	-	-	-	1	1.48	-	-	-	-	-	-	-	-	-	-	
<i>Moxostoma macrolepidotum</i>	-	-	-	-	1	1.32	-	-	4	6.04	-	-	-	-	-	-	-	-	-	-	
<i>Ictalurus punctatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Lepomis gibbosus/L. macrochirus</i>	-	-	-	-	1	1.32	-	-	-	-	-	-	-	-	-	-	-	-	1	1.33	
<i>Pomoxis nigromaculatus</i>	-	-	-	-	-	-	8	10.17	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Itheostoma olmstedii</i>	-	-	7	10.52	9	12.05	4	5.01	1	1.52	1	1.46	-	-	1	1.35	5	6.58	-	-	
<i>E. gonale</i>	-	-	18	27.05	4	5.31	8	10.11	7	10.56	-	-	-	-	-	-	-	-	8	10.45	
<i>Percina peltata</i>	-	-	2	3.01	1	1.35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Stizostedion v. vitreum</i>	-	-	1	1.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TOTAL	74	111.20	462	617.67	101	127.67	43	64.67	2	2.92	6	8.84	7	9.30	78	102.01					

Table 3.2-54 continued.

	Jul 6		Jul 13		Jul 20		Jul 27		Aug 3		Aug 10		Aug 16		Aug 24		Total	%
	n	density	n	density	n	density	n	density	n	density	n	density	n	density				
<i>Dorosoma cepedianum</i>	-	-	-	-	-	-	1	1.52	-	-	-	-	-	-	-	-	19	2.26
<i>Cyprinus carpio</i>	1	1.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	439	52.20
<i>Notropis anogenus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.12
<i>N. hudsonius</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	111	13.20
<i>N. spilopterus</i>	1	1.39	2	3.72	6	9.50	-	-	4	5.80	1	1.49	13	19.52	1	1.50	32	3.80
<i>N. volucellus</i>	-	-	-	-	-	-	-	-	1	1.42	-	-	-	-	-	-	1	0.12
<i>Carpiodes cyprinus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	107	12.72
<i>Catostomus commersoni</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0.24
<i>Moxostoma macrolepidotum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.59
<i>Ictalurus punctatus</i>	-	-	-	-	1	1.59	-	-	1	1.42	-	-	-	-	-	-	2	0.24
<i>Ambloplites rupestris</i>	1	1.39	-	-	8	12.54	-	-	-	-	-	-	-	-	-	-	9	1.07
<i>Lepomis gibbosus/L. macrochirus</i>	-	-	5	9.13	3	4.68	12	18.18	-	-	3	4.38	1	1.50	-	-	33	3.92
<i>Pomoxis nigromaculatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.12
<i>Itheostoma olmstedii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	3.33
<i>E. gonale</i>	2	2.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47	5.59
<i>Percina peltata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0.36
<i>Stizostedion v. vitreum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.12
TOTAL	5	6.94	7	12.85	18	28.32	13	19.69	6	8.64	4	5.87	14	21.02	1	1.50	841	

Table 3.2-55

Summary of ichthyoplankton densities (n/100 m³) taken by push net at 14 stations in York Haven Pond, day (D) and night (N), April through August 1982.

		Apr	May	May	May	May	Jun	Jun	Jun	Jun	Jun	Jul	Jul	Jul	Jul	Aug	Aug	Aug	Mean		
		27	4	11	18	25	2	10	15	22-23	30	6	13	20	27	3	10	16	24	Day	Night
TM-LF-1481	D	-	-	3.86	5.98	17.29	142.93	44.26	6.36	-	-	269.27	602.96	9.04	170.75	47.21	18.65	3.02	74.53		
	N	-	19.95	25.33	45.46	184.33	111.12	20.67	7.02	14.22	37.39	54.62	503.02	5799.45	1893.80	446.76	115.67	259.91	89.26	528.80	
TM-LF-1581	D	-	-	-	1.61	1.36	14.22	1.57	1.64	-	6.07	5.37	1.41	6.31	3.11	-	1.55	-	2.45		
	N	-	1.52	35.68	32.87	38.53	28.09	10.88	1.63	22.44	7.55	4.48	26.80	30.09	5.30	8.85	3.14	5.69	1.45	14.72	
TM-LF-181	D	-	-	-	54.17	40.53	13.68	14.94	3.20	7.65	8.58	5.51	6.83	4.63	3.01	1.40	3.47	11.28	2.89	10.10	
	N	-	14.04	102.09	581.08	62.40	7.69	11.60	16.21	13.58	55.36	21.52	82.17	57.33	9.52	12.49	1.67	10.26	-	58.83	
TM-LF-1281	D	-	-	1.60	4.62	45.21	27.25	23.94	2.98	-	7.51	4.44	145.57	60.58	7.56	9.52	3.27	1.43	-	19.19	
	N	2.93	-	26.14	61.92	81.89	20.68	14.13	9.26	23.34	24.28	25.67	143.71	171.74	161.95	16.56	7.95	41.34	37.11	47.15	
TM-LF-12A1	D	-	1.65	-	3.11	4.45	78.58	9.61	1.67	4.76	9.01	5.19	3.92	12.84	10.22	10.38	1.85	2.62	-	8.86	
	N	-	4.32	43.77	113.93	18.82	52.46	-	9.56	27.04	14.60	22.19	21.17	36.56	18.70	8.79	25.12	122.70	-	32.76	
TM-LF-13A1	D	-	-	4.67	5.50	6.01	13.09	11.08	5.05	5.82	-	1.39	3.14	-	-	-	-	-	-	3.10	
	N	-	-	18.94	205.86	30.76	54.72	13.95	15.29	15.06	14.50	2.88	18.14	7.90	1.69	3.07	9.09	12.43	1.52	23.66	
TM-LF-13A2	D	-	-	1.45	11.17	5.37	98.83	16.37	12.88	7.55	21.69	1.15	22.85	14.00	-	8.63	10.61	1.45	-	10.78	
	N	-	4.59	154.27	571.90	91.04	317.02	12.39	31.16	52.36	48.05	16.93	74.36	32.42	51.96	26.64	20.07	14.00	3.01	84.57	
TM-LF-4A1	D	-	-	3.44	23.37	61.03	7.69	3.15	2.49	-	6.27	1.52	197.42	321.42	833.32	236.83	4.27	21.39	4.28	95.99	
	N	-	-	14.57	196.54	191.47	40.57	-	1.58	11.49	26.27	1.40	228.99	523.77	225.32	15.18	176.20	26.47	32.78	150.73	
TM-LF-1081	D	-	-	1.50	2.97	1.43	7.79	10.90	1.50	-	-	-	1.42	4.60	2.77	8.81	-	1.50	13.14	3.24	
	N	-	-	2.98	28.01	12.51	25.38	6.25	-	4.44	24.78	1.56	101.74	92.23	127.78	7.61	10.17	20.75	5.69	26.22	
TM-LF-1082	D	-	-	3.00	2.77	5.68	46.40	15.79	4.52	-	2.97	2.54	15.90	15.56	3.19	1.47	23.85	26.24	4.64	9.70	
	N	-	-	25.11	245.32	85.70	86.24	19.65	29.34	27.27	329.73	17.05	26.50	100.95	71.81	39.06	116.20	145.61	216.70	87.87	
TM-LF-1083	D	-	-	-	-	-	15.38	44.97	4.79	1.61	-	-	4.85	4.71	24.98	10.35	4.63	-	4.42	6.70	
	N	-	-	18.33	261.21	31.73	87.00	15.27	12.10	21.04	54.26	6.33	91.57	33.56	67.83	30.03	65.58	31.29	19.68	46.76	
TM-LF-981	D	-	-	1.46	31.63	1.49	17.91	6.52	6.89	3.13	18.78	-	14.95	9.68	4.47	17.44	24.49	-	1.50	8.91	
	N	-	1.41	67.91	887.11	108.93	180.14	4.34	14.77	53.34	244.79	2.96	32.96	11.33	17.05	8.90	181.74	17.34	2.95	101.50	
TM-LF-11A1	D	-	1.66	1.44	11.99	9.57	23.39	1.54	7.1	2.94	15.96	-	14.95	15.30	-	6.16	6.22	1.29	-	4.63	
	N	-	2.72	150.08	456.21	170.84	191.39	4.52	7.36	21.88	82.77	9.10	11.34	36.00	50.08	29.07	36.28	19.66	7.29	71.81	
TM-LF-16A1	D	-	-	-	5.38	2.70	9.67	10.74	6.09	1.50	4.57	-	12.74	8.38	1.52	9.82	5.88	-	-	4.39	
	N	-	-	111.20	617.67	177.67	64.67	2.92	8.84	9.30	102.01	6.94	12.85	28.32	19.69	8.64	5.87	21.02	1.53	63.84	
Mean	D	-	0.24	1.60	11.72	14.42	34.06	15.38	4.79	2.50	7.24	1.96	51.07	77.21	64.51	35.11	9.75	6.14	2.42	18.90	
	N	0.71	3.48	56.74	306.08	88.33	90.51	9.76	11.70	22.63	26.89	13.83	170.06	590.85	194.11	57.26	57.48	53.50	28.46	95.66	

Table 3.2-56

Summary of numbers, diversity and equitability indices of Ichthyoplankton taken in day (D) and night (N) samples by push net at 14 stations in York Haven Pond, April through August 1982.

	IM-LF-1481		IM-LF-1581		IM-LF-161		IM-LF-1781		IM-LF-1821		IM-LF-1921		IM-LF-202		IM-LF-2081		IM-LF-2082			
	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	N		
Clupeidae																				
<i>Boreosoma cepedianum</i>	-	10	-	-	-	-	5	2	-	-	-	-	5	24	16	22	-	1	-	1
SUBTOTAL	-	10	-	-	-	-	5	2	-	-	-	-	5	24	16	22	-	1	-	1
Cyprinidae																				
<i>Composita anomala</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Cyprinus carpio</i>	1	48	6	11	42	431	3	32	8	7	5	136	15	337	2	138	2	20	2	343
<i>Notemigonus crysoleucas</i>	-	34	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	
<i>Notropis aeneus</i>	11	5	-	-	-	1	3	-	1	-	-	-	-	4	-	1	-	-	1	1
<i>N. aeneus/N. volucellus</i>	4	4	3	-	-	1	-	1	-	-	1	1	5	1	-	-	-	-	3	1
<i>N. hudsonius</i>	7	67	4	8	10	52	3	24	10	39	5	8	6	178	1	9	4	9	6	47
<i>N. promelas</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
<i>N. spilopterus</i>	96	492	4	29	17	62	5	75	4	178	2	19	3	62	8	129	13	31	24	360
<i>N. volucellus</i>	15	48	1	-	2	-	4	6	3	9	-	1	-	6	4	14	1	5	8	22
<i>Pimephales notatus</i>	2	2	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Rhinichthys atratulus</i>	1	2	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
<i>R. cataractae</i>	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-	-	-
<i>Semotilus atromaculatus</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>S. corporalis</i>	1	1	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
SUBTOTAL	139	704	18	48	72	517	20	140	26	234	13	165	26	588	17	294	20	65	44	796
Carostomidae																				
<i>Carostomus cyprinus</i>	4	77	3	47	9	71	-	41	6	55	10	61	7	244	4	68	2	21	5	81
<i>Carostomus commersoni</i>	11	17	-	1	-	1	3	-	-	-	-	-	2	1	-	2	-	-	-	5
<i>Hypentelium nigricans</i>	2	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-
<i>Moxostoma macrolepidotum</i>	4	5	4	6	5	5	-	10	50	21	6	15	4	10	2	7	3	3	14	40
SUBTOTAL	21	99	7	54	14	77	6	55	56	76	16	76	13	255	6	77	5	24	20	124
Ictaluridae																				
<i>Ictalurus natalis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
<i>I. punctatus</i>	-	2	-	8	-	16	-	8	-	5	-	4	-	27	-	-	-	2	-	3
SUBTOTAL	-	2	-	8	-	16	-	8	-	5	-	4	-	28	-	-	-	2	-	3
Centrarchidae																				
<i>Ambloplites rupestris</i>	8	17	-	5	-	4	-	5	-	4	-	2	1	3	-	1	1	3	-	4
<i>Lepomis auritus</i>	-	3	-	5	-	1	-	3	-	1	-	3	-	1	-	-	-	1	-	4
<i>L. gibbosus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-
<i>L. macrochirus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	627	5076	3	6	5	10	171	328	22	16	1	5	35	61	1611	1272	5	200	28	114
<i>Micropterus dolomieu</i> *	6	5	-	-	-	-	2	1	-	1	-	1	-	-	-	1	-	1	-	4
<i>M. salmoides</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Foxoxia annularis</i>	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	2	-	-	-	-
<i>F. niaromaculatus</i>	-	-	-	-	-	-	1	-	-	-	1	1	-	1	-	1	-	1	-	-
<i>Foxoxia</i> spp.	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
SUBTOTAL	641	5102	3	16	5	15	174	337	22	22	1	12	37	68	1012	1280	6	206	28	126
Percidae																				
<i>Etheostoma caeruleum</i>	2	3	-	3	5	39	1	17	5	72	2	21	5	17	-	9	2	2	6	19
<i>E. zonale</i>	68	44	2	49	18	47	20	10	4	17	4	13	37	81	20	7	4	4	10	7
<i>Percina flavescens</i>	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Percina peltata</i>	3	10	-	4	1	10	3	1	1	3	-	-	-	7	6	3	1	-	2	9
<i>Stizostedion v. vitreum</i>	-	7	-	-	-	1	-	1	1	-	-	-	-	-	-	1	-	-	1	-
SUBTOTAL	74	64	2	56	24	97	24	29	11	87	6	24	42	106	26	19	7	7	19	35
Unidentified	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	875	5981	30	142	116	723	227	571	115	424	36	291	123	1069	1077	1692	38	305	111	1083
GRAND TOTAL	6856		217		839		798		539		327		1792		2769		363		1194	
Number of Species	19	24	9	13	11	16	16	20	12	15	8	15	14	21	13	20	11	15	13	17
Total Species	26		15		17		23		17		15		23		21		16		15	
Diversity Index	1.82	1.01	* 2.91	2.72	2.30	1.57	2.31	2.57	2.65	* 2.47	2.79	2.84	0.70	1.63	* 1.92	3.05	2.58			
Equitability Index	0.38	0.22	* 0.79	0.79	0.58	0.39	0.53	0.72	0.68	* 0.63	0.73	0.66	0.13	0.34	* 0.49	0.82	0.63			

* Indices were not calculated on samples of less than 50 specimens.

Table 3.2-56 cont. mod.

	11-17-10B		11-17-921		11-17-11A		11-17-16A		DAY		NIGHT		GRAND TOTAL		Taken wt Night
	D	N	D	N	D	N	D	N	TOTAL	%	TOTAL	%	TOTAL	%	
Clupeidae															
<i>Dorosoma cepedianum</i>	-	-	-	5	1	8	-	19	26	0.85	92	0.57	118	0.62	77.97
SUBTOTAL	-	-	-	5	1	8	-	19	26	0.85	92	0.57	118	0.62	77.97
Cyprinidae															
<i>Campostoma anomalum</i>	-	-	1	-	-	-	-	-	2	0.07	-	-	2	0.01	-
<i>Cyprinus carpio</i>	-	161	39	746	19	321	6	439	150	4.89	3135	19.58	3285	17.22	95.43
<i>Notropis cyprinoides</i>	-	-	-	-	-	-	-	-	1	0.03	35	0.22	36	0.19	97.22
<i>Notropis anogenus</i>	-	2	1	-	-	-	-	1	17	0.55	15	0.09	32	0.17	46.88
<i>N. anogenus/N. volucellus</i>	-	-	-	-	-	1	-	-	12	0.39	14	0.09	26	0.14	53.85
<i>N. hudsonius</i>	4	61	2	107	7	191	3	111	71	2.31	931	5.81	1002	5.25	92.41
<i>N. stroce</i>	-	-	-	-	-	-	-	-	2	0.07	-	-	2	0.01	-
<i>N. spilopterus</i>	2	96	17	141	5	79	3	32	209	6.62	1784	11.14	1997	10.41	89.78
<i>N. volucellus</i>	2	4	1	1	-	10	-	-	41	1.36	129	0.81	170	0.89	75.88
<i>Pimephales notatus</i>	-	-	-	-	-	-	-	-	3	0.10	2	0.01	5	0.03	40.00
<i>Rhinichthys atratulus</i>	-	-	-	-	-	-	-	-	1	0.03	4	0.02	5	0.03	80.00
<i>R. c. carotus</i>	-	-	-	-	-	-	-	-	1	0.03	1	0.01	2	0.01	50.00
<i>Semotilus atromaculatus</i>	-	-	-	-	-	-	-	-	-	-	1	0.01	1	0.01	100.00
<i>S. corporalis</i>	-	-	-	-	-	1	-	-	2	0.07	3	0.02	5	0.03	60.00
SUBTOTAL	8	324	61	995	31	603	11	534	506	16.49	6055	37.82	6561	25.39	92.29
Carostomidae															
<i>Carpiloides cyprinus</i>	-	53	1	200	3	208	6	107	68	2.22	1334	8.33	1402	7.35	95.15
<i>Catostomus commersoni</i>	-	-	1	1	-	1	-	2	15	0.49	32	0.20	47	0.25	68.09
<i>Hypentelium nigricans</i>	-	-	-	-	1	-	-	-	4	0.13	1	0.01	5	0.03	20.00
<i>Moxostoma macrolepidotum</i>	12	43	2	7	4	9	1	5	111	3.62	186	1.16	297	1.56	62.63
SUBTOTAL	12	96	7	208	8	218	7	114	198	6.45	1553	9.70	1751	9.18	88.69
Ictaluridae															
<i>Ictalurus natalis</i>	-	-	-	-	-	-	-	-	-	-	1	0.01	1	0.01	100.00
<i>I. punctatus</i>	-	-	-	-	-	-	-	2	-	-	77	0.48	77	0.40	100.00
SUBTOTAL	-	-	-	-	-	-	-	2	-	-	78	0.49	78	0.41	100.00
Centrarchidae															
<i>Ambloplites rupestris</i>	-	3	-	5	-	4	-	9	10	0.33	69	0.43	79	0.41	87.34
<i>Lepomis auritus</i>	-	2	-	1	1	-	-	-	1	0.03	25	0.16	27	0.14	96.15
<i>L. gibbosus</i>	-	-	-	-	-	-	-	-	-	-	2	0.01	2	0.01	100.00
<i>L. macrochirus</i>	-	-	-	1	-	1	-	-	-	-	5	0.03	5	0.03	100.00
<i>L. gibbosus/L. macrochirus</i>	15	126	28	19	26	39	20	33	2015	65.66	3305	20.62	5320	28.85	78.38
<i>Micropterus salmoides</i>	-	1	-	1	-	1	-	-	8	0.26	17	0.11	25	0.13	68.00
<i>M. salmoides</i>	-	-	-	1	-	-	-	-	-	-	1	0.01	1	0.01	100.00
<i>Pomoxis annularis</i>	-	-	-	-	-	-	-	-	1	0.03	3	0.02	4	0.02	75.00
<i>P. nigromaculatus</i>	-	-	-	-	-	-	-	1	2	0.07	4	0.02	6	0.03	66.67
<i>Pomoxis</i> spp.	-	-	-	-	-	-	-	-	-	-	1	0.01	1	0.01	100.00
SUBTOTAL	33	132	28	78	27	65	20	43	2037	66.40	7432	46.62	9469	49.63	78.49
Percidae															
<i>Etheostoma vitreum</i>	4	17	5	30	2	19	4	28	7	1.60	17	1.05	24	1.28	87.25
<i>E. nana</i>	23	1	8	34	8	76	7	47	233	7.59	432	2.70	665	3.49	66.96
<i>Percis flavescens</i>	-	-	-	-	-	-	-	-	1	0.03	-	-	1	0.01	-
<i>Percina palmarum</i>	1	2	1	3	2	5	-	3	21	0.68	60	0.37	81	0.42	76.07
<i>Trizostema v. vitreum</i>	-	-	-	-	-	-	-	1	2	0.07	11	0.07	13	0.07	86.62
SUBTOTAL	28	20	14	67	12	100	11	79	309	9.78	800	5.09	1109	5.77	72.73
Unidentified	-	-	-	-	-	-	-	-	1	0.03	1	0.01	2	0.01	50.00
TOTAL	31	572	110	1503	79	974	50	841	3068		16011		19079		
GRAND TOTAL	653		1413		1053		891								
Number of Species	8	14	12	17	12	17	10	17	27		31		33		
Total Species	14		18		19		18								
Diversity Index	2.18	2.72	2.51	2.03	2.75	2.66	2.53	2.26	3.07		2.49		2.47		
Equitability Index	0.73	0.71	0.70	0.51	0.77	0.66	0.77	0.58	0.44		0.51		0.50		

Table 3.2-57 continued.

		Apr	May	May	May	May	Jun	Jun	Jun	Jun	Jun	Jul	Jul	Jul	Jul	Aug	Aug	Aug	Aug	TOTAL	
		27	4	11	18	25	2	10	15	22-23	30	6	13	20	27	3	10	16	24	Day	Night
<i>Ictalurus nebulosus</i>	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>I. punctatus</i>	D	-	-	-	-	-	-	-	-	-	-	1	62	12	-	1	-	-	1	-	77
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
<i>Ambloplites rupestris</i>	D	-	-	-	-	-	8	1	-	-	-	7	13	28	2	3	1	2	-	-	69
	N	-	-	-	-	8	5	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<i>Leucis auritus</i>	D	-	-	-	-	-	-	-	-	-	-	3	-	3	2	4	10	3	-	-	25
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus</i>	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	2
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. macrochirus</i>	D	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	2	-	-	-	5
	N	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	D	-	-	-	54	1	-	-	-	14	4	499	623	530	212	57	18	3	-	2015	7305
	N	-	-	1	113	-	-	-	-	49	37	1359	1933	1456	197	111	37	12	-	-	8
<i>Micropterus dolomieu</i>	D	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
	N	-	-	-	2	9	3	1	-	-	1	-	-	-	-	-	-	-	1	-	-
<i>M. salmoides</i>	D	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pomoxis annularis</i>	D	-	-	-	-	-	-	-	-	1	-	-	-	3	-	-	-	-	-	-	3
	N	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	2
<i>P. nigromaculatus</i>	D	-	-	-	1	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	4
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pomoxis</i> spp.	D	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Etheostoma caeruleum</i>	D	-	4	27	104	39	43	15	1	3	14	1	1	-	-	-	-	-	-	43	297
	N	-	-	-	8	23	74	89	28	7	3	4	2	1	-	-	-	-	-	233	432
<i>E. zonale</i>	D	-	-	47	17	101	158	11	9	14	28	24	19	1	1	-	-	-	-	1	-
	N	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Percis flavescens</i>	D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Percis peltata</i>	D	-	1	6	10	3	-	-	-	1	-	-	-	-	-	-	-	-	-	-	21
	N	1	15	15	17	10	2	-	-	-	-	-	-	-	-	-	-	-	-	-	60
<i>Skistostedion y. vitreum</i>	D	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
	N	1	7	7	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Unidentified	D	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1
	N	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL	D	-	2	14	114	137	292	145	44	23	66	19	525	657	543	320	85	59	23	3068	16011
	N	2	30	540	3135	955	891	86	113	221	724	129	1574	4214	1615	436	570	557	267	-	-
Number of Species	D	-	2	5	7	12	17	12	7	4	12	4	6	8	4	4	6	3	3	27	31
	N	2	5	9	16	15	17	8	8	7	19	15	12	14	8	9	7	8	4	-	-
Total Species	D	2	5	10	16	18	22	14	10	8	14	15	13	14	8	10	9	8	4	-	-
Diversity Index	D	*	*	*	1.60	2.65	2.80	2.07	*	*	2.28	*	0.38	0.39	0.19	1.07	1.38	1.25	*	-	-
	N	*	*	1.93	1.41	2.66	2.19	2.58	1.50	1.09	1.60	2.53	0.91	0.51	0.61	1.36	1.19	0.75	0.56	-	-
Equitability Index	D	*	*	*	0.57	0.74	0.68	0.58	*	*	0.66	*	0.15	0.13	0.09	0.53	0.53	0.78	*	-	-
	N	*	*	0.51	0.35	0.68	0.53	0.86	0.50	0.39	0.48	0.45	0.25	0.13	0.20	0.43	0.48	0.25	0.28	-	-
Ratio of Numbers N/D		-	15.0	38.6	27.5	7.0	3.1	0.6	2.6	9.6	11.0	6.8	3.0	6.4	3.0	1.4	6.1	2.4	11.0	-	5.2

* Indices were not calculated on samples of less than 50 specimens.

Table 3.2-58

Summary of number and percent of larval and young fish taken in York Haven Pond, 1982.

		Apr	Apr	Apr	May	May	May	Jun	Jun	Jun	Jun	Jun	Jul	Jul	Jul	Jul	Aug	Aug	Aug	Aug	TOTAL	PERCENT	
		13	21	27	4	11	18	25	2	10	15	22-23	30	6	13	20	27	3	10	16	24		
DAY	Larvae	-	-	-	2	14	114	137	284	134	40	22	66	19	524	657	542	250	70	24	2	2902	96.54
	Young	-	-	-	-	-	-	8	11	4	1	-	-	1	-	1	70	15	35	20	166	1.46	
NIGHT	Larvae	-	-	2	39	540	3131	953	885	78	310	219	723	126	1512	4197	1598	422	375	462	275	15588	97.36
	Young	-	-	-	-	4	2	6	10	3	2	1	3	62	17	17	14	145	95	42	423	2.64	

Table 3.2-59

Mean density (n/100 m³) of *Lepomis carpio* taken at night by push net in York Haven Pond, 1982.

Station	May 11	May 18	May 22	Jun 2	Jun 10	Jun 15	Jun 22-23	Jun 30	Jul 6	Jul 13	Jul 20	Jul 27	Total	Mean
TM-LF-14B1	-	10.58	42.93	2.85	1.74	-	-	-	-	-	3.21	3.39	66.70	5.39
TM-LF-15B1	-	5.51	1.31	-	-	-	-	4.52	-	-	4.80	-	16.14	1.35
TM-LF-181	-	509.03	4.46	7.69	-	-	-	32.03	4.32	15.25	-	-	572.78	47.73
TM-LF-12B1	-	7.66	27.30	-	-	-	NO	3.09	-	-	3.33	-	41.38	3.45
TM-LF-12A1	-	2.72	-	-	-	-	-	4.41	-	1.51	1.59	-	10.23	0.85
TM-LF-13A1	-	192.44	-	-	-	-	-	4.33	-	4.53	-	1.69	203.01	16.92
TM-LF-13A2	-	414.70	23.06	4.30	-	-	-	7.79	1.43	1.48	2.94	-	455.89	37.97
TM-LF-6A1	-	124.62	55.73	8.11	-	-	FISH	10.84	-	-	1.71	-	201.01	16.75
TM-LF-10B1	-	8.91	4.17	-	-	-	-	8.75	-	-	4.62	1.80	28.25	2.35
TM-LF-10B2	-	152.55	41.59	-	-	-	-	298.90	-	2.94	-	6.24	502.22	41.85
TM-LF-10B3	1.31	188.81	6.35	-	-	-	-	33.14	-	-	-	-	229.61	19.13
TM-LF-9B1	-	760.89	6.33	-	-	-	TAKEN	238.46	-	19.73	-	-	1025.41	85.45
TM-LF-11A1	-	321.67	25.37	1.27	-	-	-	58.08	1.51	4.35	3.13	-	415.38	34.62
TM-LF-11A1	-	451.96	60.74	-	-	-	-	66.63	1.39	-	-	1.52	582.20	48.52
TM-LF-16A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	0.09	225.15	21.38	1.73	0.12	-	-	55.07	0.62	3.26	1.81	1.05	-	25.88

Table 3.2-60

Mean density (n/100 m³) of *Notropis hudsonius* taken at night by push net in York Haven Pond, 1982.

Station	May 4	May 11	May 18	May 25	Jun 2	Jun 10	Jun 15	Jun 22-23	Jun 30	Jul 6	Jul 13	Jul 20	Total	Mean
TM-LF-14B1	-	-	3.03	66.91	5.70	10.32	1.38	1.40	-	-	-	-	88.74	7.39
TM-LF-15B1	-	-	4.09	-	5.43	1.33	-	-	1.49	-	-	-	11.54	0.96
TM-LF-181	-	63.31	16.92	5.94	-	1.45	2.94	1.37	5.80	-	-	-	77.73	6.48
TM-LF-12B1	-	-	11.39	7.44	1.38	3.71	-	-	8.24	-	-	-	31.57	2.63
TM-LF-12A1	1.44	5.65	42.01	-	1.54	-	-	2.50	-	-	-	-	53.14	4.43
TM-LF-13A1	-	2.91	1.49	-	4.10	1.57	-	-	-	-	-	-	11.52	0.96
TM-LF-13A2	-	122.79	63.51	18.21	32.99	1.56	-	17.78	1.51	1.39	1.48	-	261.27	21.77
TM-LF-4A1	-	4.37	2.98	2.86	-	-	-	-	1.51	-	-	1.71	13.46	1.12
TM-LF-10B1	-	1.49	5.13	2.78	1.41	1.55	-	-	-	-	-	-	12.36	1.03
TM-LF-10B2	-	8.37	67.83	8.82	5.95	1.51	-	-	-	-	-	-	92.48	7.71
TM-LF-10B3	-	7.86	59.58	5.08	2.79	1.53	1.51	1.91	-	-	-	-	85.26	7.11
TM-LF-9B1	-	56.10	87.15	2.53	3.16	-	-	-	-	-	-	-	148.94	12.61
TM-LF-11A1	-	124.16	77.55	27.78	3.80	-	-	7.31	13.14	-	-	-	253.74	21.15
TM-LF-11A1	-	54.10	74.74	8.72	4.56	-	-	1.35	10.49	-	-	-	153.96	12.83
TM-LF-16A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	0.10	30.79	36.96	11.22	5.49	1.72	0.62	2.99	2.53	0.10	0.11	0.12	-	7.71

Table 3.2-61

Mean density (n/100 m³) of *Notropis spilopterus* taken at night by push net in York Haven Pond, 1982.

Station	May 18	May 25	Jun 2	Jun 10	Jun 15	Jun 22-23	Jun 30	Jul 6	Jul 13	Jul 20	Jul 27	Aug 3	Aug 10	Aug 16	Aug 24	Total	Mean
TM-LF-14B1	-	13.89	-	-	-	-	12.48	6.26	2.62	118.98	66.09	197.55	52.87	209.54	55.09	735.37	69.02
TM-LF-15B1	-	-	-	-	-	-	1.53	4.48	6.31	20.57	1.80	2.96	-	5.69	1.45	64.79	2.98
TM-LF-181	-	-	-	-	-	-	4.36	2.87	30.43	23.90	9.52	12.49	1.67	10.26	-	95.50	4.37
TM-LF-12B1	-	-	-	3.12	-	-	6.07	9.03	3.09	3.33	4.63	3.01	6.36	38.59	31.60	108.63	7.24
TM-LF-12A1	-	-	-	1.38	-	-	2.30	5.94	7.55	6.36	12.26	3.79	70.79	118.82	-	244.19	16.78
TM-LF-13A1	-	-	-	-	-	-	1.45	1.43	4.54	3.16	-	-	4.54	11.06	1.52	27.68	1.85
TM-LF-13A2	-	4.86	1.43	1.56	-	1.33	7.75	8.44	2.98	5.91	8.13	16.85	12.90	14.00	3.01	89.15	5.94
TM-LF-4A1	-	8.57	-	-	-	-	4.63	1.40	6.44	18.93	5.34	6.11	97.54	16.18	32.75	197.92	13.19
TM-LF-10B1	5.06	1.39	-	-	-	-	-	1.56	3.06	1.55	9.01	-	2.91	15.23	5.69	45.44	3.03
TM-LF-10B2	-	-	1.49	-	2.67	-	26.23	10.85	13.23	16.80	24	26.04	87.94	129.60	207.32	528.41	35.23
TM-LF-10B3	-	-	-	-	-	-	6.03	1.58	9.15	16.00	5.09	16.52	46.38	31.29	16.65	148.69	9.91
TM-LF-9B1	-	-	1.58	-	-	-	10.61	1.48	8.42	3.21	6.05	5.94	151.35	17.34	2.95	207.33	13.82
TM-LF-11A1	-	1.28	1.27	-	-	-	5.76	3.04	2.89	6.26	23.57	26.01	29.97	16.85	1.46	118.36	7.89
TM-LF-11A1	-	1.29	-	-	-	-	3.96	1.39	3.72	9.50	-	5.80	1.49	19.52	1.50	48.17	3.23
TM-LF-16A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean	0.76	2.23	0.41	0.33	0.29	0.10	7.90	4.27	7.46	18.18	11.52	23.63	40.48	46.71	25.77	-	12.57

Table 3.2-62

Mean density (n/100 m³) of *Lernaeus cyprinus* taken at night by push net in York Haven Pond, 1982.

Station	May 11	May 18	May 25	Jun 2	Jun 10	Jun 17	Jun 22-23	Jun 30	Jul 6	Total	Mean
TH-1F-14B1	23.75	17.15	26.51	35.62	1.71	-	8.56	1.55	-	109.85	12.21
TH-1F-15B1	12.84	13.73	14.08	7.39	-	-	17.95	-	-	65.99	7.33
TH-1F-161	20.11	26.87	26.74	-	5.80	10.32	8.12	5.76	-	103.72	11.52
TH-1F-12B1	5.70	10.15	12.41	11.03	-	1.54	13.74	-	-	54.57	6.06
TH-1F-12A1	15.53	1.37	13.86	16.97	-	6.84	19.62	-	-	74.19	8.24
TH-1F-13A1	2.91	4.48	22.75	21.29	4.66	15.29	15.06	-	-	87.04	9.67
TH-1F-13A2	15.74	52.32	31.59	183.61	4.61	23.73	31.72	1.53	-	344.87	38.31
TH-1F-4A1	4.37	33.77	32.86	12.37	-	1.58	11.49	1.54	-	97.78	10.86
TH-1F-10B1	1.49	8.91	1.39	12.69	-	-	4.44	-	-	28.92	3.21
TH-1F-10B2	4.18	16.60	22.69	19.33	4.54	17.24	24.41	1.52	1.56	112.17	12.48
TH-1F-10B3	5.24	7.14	15.23	16.88	4.58	9.07	19.13	-	-	77.27	8.58
TH-1F-9B1	8.86	21.56	57.00	134.32	1.44	12.99	51.97	1.47	-	289.61	32.18
TH-1F-11A1	12.28	39.23	67.06	122.95	3.03	7.36	14.57	1.47	-	267.95	29.77
TH-1F-16A1	13.52	44.28	31.63	39.90	1.46	8.84	6.60	2.58	-	147.91	16.43
Mean	10.47	20.90	26.86	45.28	2.27	8.21	17.67	1.24	0.11		15.77

Table 3.2-63

Mean density (n/100 m³) of *Leopoldia villosus*/L. *macrochirus* taken at night by push net in York Haven Pond, 1982.

Station	May 18	May 22	Jun 2	Jun 10	Jun 15	Jun 22-23	Jun 30	Jul 6	Jul 13	Jul 20	Jul 27	Aug 3	Aug 10	Aug 16	Aug 24	Total	Mean
TH-1F-14B1	-	13.89	-	-	-	-	23.56	43.71	483.37	5527.60	1759.91	232.51	47.92	38.45	14.16	8140.88	505.96
TH-1F-15B1	-	-	-	-	-	-	-	-	4.73	1.60	1.80	1.47	-	-	-	9.60	0.64
TH-1F-161	-	4.46	-	-	-	-	-	-	-	11.18	-	-	-	-	-	45.64	1.06
TH-1F-12B1	-	29.78	NO	-	-	-	12.09	12.08	126.70	153.39	157.32	12.04	1.59	1.37	2.86	508.22	35.95
TH-1F-12A1	-	-	-	-	-	-	-	-	4.53	14.32	1.46	-	4.33	-	-	24.62	1.86
TH-1F-13A1	-	-	-	-	-	-	-	-	-	4.74	-	3.07	-	-	-	7.81	0.57
TH-1F-13A2	-	3.64	-	-	-	-	-	22.26	20.62	35.71	6.99	2.87	-	-	-	92.09	6.34
TH-1F-4A1	1.49	82.88	FISH	-	-	-	7.71	-	1219.34	489.33	236.40	5.99	59.78	5.41	-	2088.33	159.22
TH-1F-10B1	-	-	-	-	-	-	18.03	-	95.66	79.88	115.18	4.07	7.77	1.38	-	321.67	23.43
TH-1F-10B2	-	-	-	-	-	-	-	-	5.91	73.51	57.78	13.02	25.13	1.33	-	176.68	11.78
TH-1F-10B3	-	2.54	-	-	-	-	13.55	1.58	82.22	15.97	57.74	13.50	11.20	-	-	198.30	13.22
TH-1F-9B1	-	2.53	TAKEN	-	-	-	-	-	1.39	1.61	12.41	2.96	7.42	-	-	28.37	1.89
TH-1F-11A1	-	2.56	-	-	-	-	-	-	4.32	21.89	23.57	1.54	3.18	-	1.46	58.50	3.90
TH-1F-16A1	-	10.17	-	-	-	-	1.33	-	9.13	4.68	18.18	-	4.38	1.50	-	49.17	3.29
Mean	0.11	10.89	-	-	-	-	5.31	4.10	147.11	458.58	175.53	21.37	12.20	3.52	1.32		56.02

Table 3.2-64

Mean density (n/100 m³) of *Etheostoma nigrstedii* taken at night by push net in York Haven Pond, 1982.

Station	May 4	May 11	May 18	May 25	Jun 2	Jun 10	Jun 15	Jun 22-23	Jun 30	Jul 6	Jul 13	Total	Mean
TH-1F-14B1	-	-	-	-	4.27	-	-	-	-	-	-	4.27	0.39
TH-1F-15B1	-	-	2.77	-	1.48	-	-	-	-	-	-	4.25	0.35
TH-1F-161	8.02	29.39	15.49	2.97	-	1.45	-	-	2.92	-	-	60.24	5.48
TH-1F-12B1	-	11.37	7.62	-	-	3.15	-	-	1.55	-	-	23.63	2.15
TH-1F-12A1	-	21.18	66.49	4.97	1.54	-	-	1.21	2.89	-	-	98.28	8.93
TH-1F-13A1	-	10.20	5.95	1.32	8.21	1.52	-	-	2.91	-	-	30.11	2.74
TH-1F-13A2	-	7.87	2.76	3.64	10.94	-	-	-	-	-	-	24.31	2.21
TH-1F-4A1	-	2.91	4.37	1.43	4.04	-	-	-	-	-	-	12.77	1.16
TH-1F-10B1	-	-	-	-	4.23	-	-	-	-	-	-	4.23	0.38
TH-1F-10B2	-	4.18	4.17	2.52	7.43	7.56	-	1.43	-	-	-	27.29	2.48
TH-1F-10B3	-	3.93	4.27	1.27	7.79	6.12	-	-	-	-	-	29.38	2.13
TH-1F-9B1	-	1.48	10.78	17.73	3.16	1.45	1.43	-	1.51	1.48	1.39	40.41	3.67
TH-1F-11A1	-	2.73	5.11	8.87	6.34	-	-	-	1.43	-	-	26.48	2.73
TH-1F-16A1	-	10.52	12.05	5.01	1.52	1.46	-	1.35	6.58	-	-	38.69	3.59
Mean	0.57	7.55	10.13	3.55	4.29	1.62	0.10	0.79	1.43	0.11	0.10		2.20

Table 3.2-67
Length frequency distribution (0.5 mm intervals) and life stage of *Hexocypa hudsonica* taken at night by push net in York Haven Pond, 1962. Life stages are designated as P (protelarvae), M (metelarvae), Y (young), and Y (young).

Length Interval (mm)	May		Jun		Jul		Aug		Sept		Oct		Total		
	5	31	7	10	13	13	20	27-23	30	6	13	20	P	M	Y
4.1-4.5		4P						1P					6		
5.0-5.0		1P	1P					1P	6P				62		
5.1-5.5		110P	142P	60P				16P	16P		1P		337		
5.6-6.0	1P	123P	132P	36P				11P	2P				358		
6.1-6.5		6P	57P/36	8P/36				1P					63		5
6.6-7.0			10P/36	6P/36									14		8
7.1-7.5			5P	6P									11		11
7.6-8.0			1P	1P									2		2
8.1-8.5													4		4
8.6-9.0													4		4
9.1-9.5													2		2
9.6-10.0															
10.1-10.5															
10.6-11.0															
11.1-11.5															
11.6-12.0															
12.1-12.5															
12.6-13.0															
13.1-13.5															
13.6-14.0															
14.1-14.5															
15.6-16.0															
16.1-16.5															
18.1-19.5															
19.6-20.0															
22.6-23.0															
TOTAL													815	60	65
PERCENT													89.66	6.79	7.55

Table 3.2-68

Length frequency distribution (0.5 mm intervals) and life stage of *Notropis spilopterus* taken at night by push net in York Haven Pond, 1982. Life stages are designated as F (protolarvae), K (mesolarvae), T (metalarvae), and Y (young).

Length Interval (mm)	May	Jun	Jun	Jun	Jun	Jun	Jul	Jul	Jul	Jul	Aug	Aug	Aug	Aug	Total				
	25	2	10	15	22-23	30	6	13	20	27	3	10	16	24	F	K	T	Y	
4.1-4.5	-	-	-	-	-	-	-	-	-	-	1P	-	-	-	1	-	-	-	
4.6-5.0	-	-	-	-	-	1P	1P	5P	6P	3P	2P	8P	1P	1P	28	-	-	-	
5.1-5.5	2P	1P	-	-	1P	9P	9P	32P	47P	24P	35P	54P	31P	2P	247	-	-	-	
5.6-6.0	12P	1P	1P	-	-	28P	20P	16P	26P	13P	30P/1M	49P	86P	5P	291	1	-	-	
6.1-6.5	6P	-	-	2P	-	20P	9P	9P	1P	3P/2M	1P/1M	6P/1M	29P/6M	3P/3M	89	13	-	-	
6.6-7.0	3P	2P	1P	-	-	4P/2M	1M	-	3M	7M	3M	-	19M	2P/3M	12	38	-	-	
7.1-7.5	1M	-	-	-	-	-	-	1M	8M	9M	6M	6M	12M	7M	50	-	-	-	
7.6-8.0	-	-	-	-	-	-	-	2M	6M	6M	6M	16M	7M	11M	58	-	-	-	
8.1-8.5	-	-	-	-	-	-	-	-	6M/2T	3M	28M	4M	25M/3T	21M	87	-	5	-	
8.6-9.0	-	-	-	-	-	-	-	1M	3M/6T	4T	6M/15T	4M/9T	7M/11T	26M/5T	47	-	51	-	
9.1-9.5	-	-	-	-	-	-	-	-	8T	-	2M/20T	2M/10T	23T	5M/18T	9	-	79	-	
9.6-10.0	-	-	1T	-	-	-	-	-	9T	1T	16T	18T	28T	32T	-	-	105	-	
10.1-10.5	-	-	-	-	-	-	-	-	7T	5T	10T	7T	34T	16T	-	-	79	-	
10.6-11.0	-	-	-	-	-	-	-	-	3T	2T	6T	9T	19T	13T	-	-	52	-	
11.1-11.5	-	-	-	-	-	-	-	-	6T	1T	4T	11T	19T	15T	-	-	56	-	
11.6-12.0	-	-	-	-	-	-	-	-	-	-	1T	11T	15T	7T	-	-	34	-	
12.1-12.5	-	-	-	-	-	-	-	-	1T	1T	10T	17T/1Y	10T	-	-	-	40	1	
12.6-13.0	-	-	-	-	-	-	-	-	3T	-	1Y	14T	2Y/3Y	6T	-	-	25	4	
13.1-13.5	-	-	-	-	-	-	-	-	3T	-	2Y	8Y/8Y	1T/5Y	3T/3Y	-	-	15	18	
13.6-14.0	-	-	-	-	-	-	-	1T/2Y	1T	1Y/1Y	5Y/9Y	4Y	5Y	-	-	-	8	21	
14.1-14.5	-	-	-	1T	-	-	-	1Y	2Y	-	3T/18Y	6Y	5Y	-	-	-	4	32	
14.6-15.0	-	-	-	-	-	-	-	-	-	-	-	11Y	8Y	1Y	-	-	-	20	-
15.1-15.5	-	-	-	-	-	-	-	-	-	1T/1Y	1Y	12Y	5Y	2Y	-	-	1	21	-
15.6-16.0	-	-	-	-	-	-	-	-	-	2Y	1Y	11Y	5Y	-	-	-	-	19	-
16.1-16.5	-	-	-	-	-	-	-	-	-	2Y	-	11Y	5Y	1Y	-	-	-	19	-
16.6-17.0	-	-	-	-	-	-	-	-	-	-	-	7Y	6Y	4Y	-	-	-	17	-
17.1-17.5	-	-	-	-	-	-	-	-	2Y	1Y	2Y	5Y	4Y	-	-	-	-	14	-
17.6-18.0	-	-	-	-	-	-	-	-	-	-	-	6Y	1Y	2Y	-	-	-	7	-
18.1-18.5	-	-	-	-	-	-	-	-	-	1Y	-	4Y	1Y	1Y	-	-	-	7	-
18.6-19.0	-	-	-	-	-	-	-	-	-	5Y	-	4Y	2Y	2Y	-	-	-	9	-
19.1-19.5	-	-	-	-	-	-	-	-	-	1Y	-	1Y	2Y	1Y	-	-	-	5	-
19.6-20.0	-	-	-	-	-	-	-	-	-	1Y	-	2Y	-	-	-	-	-	3	-
20.1-20.5	-	-	-	-	-	-	-	-	-	-	-	3Y	4Y	-	-	-	-	8	-
20.6-21.0	-	-	-	-	-	-	-	-	-	-	1Y	-	2Y	-	-	-	-	3	-
21.1-21.5	-	-	-	-	-	-	-	-	-	-	-	1Y	1Y	1Y	-	-	-	3	-
21.6-22.0	-	-	-	-	-	-	-	-	-	-	1Y	-	1Y	1Y	-	-	-	3	-
22.1-22.5	-	-	-	-	-	-	-	-	-	-	-	1Y	6Y	-	-	-	-	7	-
22.6-23.0	-	-	-	-	-	-	-	-	-	-	-	-	1Y	-	-	-	-	1	-
23.1-23.5	-	-	-	-	-	-	-	-	-	-	-	2Y	1Y	-	-	-	-	3	-
23.6-24.0	-	-	-	-	-	-	-	-	-	-	-	1Y	1Y	-	-	-	-	2	-
24.6-25.0	-	-	-	-	-	-	-	-	-	-	-	1Y	-	-	-	-	-	1	-
TOTAL															668	302	554	268	
PERCENTAGE (%)															37.68	17.09	31.25	13.99	

Table 3.2-69

Length frequency distribution (0.5 mm intervals) and life stage of *Carpiodes cyprinus* taken at night by push net in York Haven Pond, 1982. Life stages are designated as P (protolarvae), M (mesolarvae), T (metalarvae), and Y (young).

Length Interval (mm)	May	May	May	Jun	Jun	Jul	Jun	Jun	Jul	Total				
	11	18	25	2	10	15	22-23	30	6	P	M	T	Y	
6.1-6.5	-	-	-	-	-	-	-	1P	-	1				
6.6-7.0	-	2P	4P	1P	2P	-	3P	4P	-	16				
7.1-7.5	1P	7P	34P	13P	3P	10P	14P	-	-	62				
7.6-8.0	6P	22P	73P	68P	3P	36P	60P	3P	1P	222				
8.1-8.5	27P	46P	86P	180P	9P	27P	76P	1P	-	452				
8.6-9.0	35P	48P	47P	129P	4P	5P	16P	2P	-	284				
9.1-9.5	12P	40P/1M	15P	17P	-	-	-	-	-	84		1		
9.6-10.0	-	8P/9M	2P/2M	-	-	-	-	-	-	10		8		
10.1-10.5	-	11M	1M	-	-	-	-	-	-	12				
10.6-11.0	-	9M	4M	-	-	-	-	-	-	13				
11.1-11.5	-	3M	2M	-	-	-	-	-	-	5				
12.6-13.0	-	-	1M	-	-	-	-	-	-	1				
13.1-13.5	-	-	2M/3T	-	-	-	-	-	-	2				3
TOTAL										1201	42	3		
PERCENT (%)										96.39	3.37	0.24		

Table 3.2-70

Length frequency distribution (0.5 mm intervals) and life stage of *Lepomis gibbosus*/L. *macrochirus* taken at night by push net in York Haven Pond, 1982. Life stages are designated as P (protolarvae), M (mesolarvae), T (metalarvae), and Y (young).

Length Interval (mm)	May	May	Jun	Jun	Jun	Jun	Jul	Jul	Jul	Jul	Aug	Aug	Aug	Aug	Total						
	18	25	2	10	15	22-23	30	6	13	20	27	2	10	18	26	P	M	T	Y		
4.1-4.5	1P	-	-	-	-	-	-	-	-	4P	-	-	-	-	-	5					
4.6-5.0	-	3P	-	-	-	-	2P	1P	4P	53P	56P	10P	3P	-	-	132					
5.1-5.5	-	52P	-	-	-	-	11P	8P	169P	239P	97P	10P	22P	1P	-	609					
5.6-6.0	-	56P	-	-	-	-	29P	26P	430P	90P	16P	1P	10P	1P	3P	662					
6.1-6.5	-	2P	-	-	-	-	7P	2P	30P/1M	33P/9M	9P/4M	1M	4P	-	-	87	15				
6.6-7.0	-	-	-	-	-	-	-	-	1M	2P/44M	11M	3M	2P/1M	-	1P	5	60				
7.1-7.5	-	-	-	-	-	-	-	-	68M	22M	3M	4M	-	1P	-	1	97				
7.6-8.0	-	-	-	-	-	-	-	-	36M	44M	5M	4M	-	1P/4M	-	1	93				
8.1-8.5	-	-	-	9M	-	-	-	-	34M	59M	8M	3M	-	-	-	104					
8.6-9.0	-	-	-	-	-	-	-	-	21M/8T	64M/17T	9M/7T	1M/1T	-	-	-	95		29			
9.1-9.5	-	-	-	-	-	-	-	-	6T	2M/80T	14*	1M/4T	-	-	-	3		104			
9.6-10.0	-	-	-	-	-	-	-	-	6T	57T	34T	4T	5T	-	-			96			
10.1-10.5	-	-	-	-	-	-	-	-	-	30T	30T	6T	-	-	-			74			
10.6-11.0	-	-	-	-	-	-	-	-	-	18T	18T	1T	1T	-	-			43			
11.1-11.5	-	-	-	-	-	-	-	-	4T	13T	27T	3T	4T	-	-			51			
11.6-12.0	-	-	-	-	-	-	-	-	-	10T	15T	4T	1T	1T	-			31			
12.1-12.5	-	-	-	-	-	-	-	-	1T	7T	4T	1T	2T	-	-			15			
12.6-13.0	-	-	-	FISH	-	-	-	-	-	2T	4T	-	2T	-	-			8			
13.1-13.5	-	-	-	-	-	-	-	-	-	2T	1T	3T	1T	-	-			7			
13.6-14.0	-	-	-	-	-	-	-	-	-	-	2T	1T	2T/1Y	-	-			5		1	
14.1-14.5	-	-	-	-	-	-	-	-	-	-	1T	2T	-	-	-			3			
14.6-15.0	-	-	-	-	-	-	-	-	-	-	1Y	-	1Y	-	-			1		1	
15.1-15.5	-	-	-	-	-	-	-	-	-	-	2T	5T	2T	-	-			9			
15.6-16.0	-	-	-	-	-	-	-	-	-	-	-	1Y/4Y	2T/1Y	-	-			3		5	
16.1-16.5	-	-	-	-	-	-	-	-	-	-	-	4T	3T	-	-			7			
16.6-17.0	-	-	-	-	-	-	-	-	-	-	-	2T	1Y	-	-			2		1	
17.1-17.5	-	-	-	TAKEN	-	-	-	-	-	-	-	2T/1Y	1Y	-	-			2		2	
17.6-18.0	-	-	-	-	-	-	-	-	-	-	-	2Y	1Y	-	-					3	
18.1-18.5	-	-	-	-	-	-	-	-	-	-	-	-	1Y	-	-					1	
18.6-19.0	-	-	-	-	-	-	-	-	-	-	-	-	1Y	-	1Y					3	
19.1-19.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					1	
19.6-20.0	-	-	-	-	-	-	-	-	-	-	-	1Y	-	-	-					1	
20.6-21.0	-	-	-	-	-	-	-	-	-	-	-	-	1Y	1Y	-					2	
22.6-23.0	-	-	-	-	-	-	-	-	-	-	-	-	1Y	1Y	-					2	
TOTAL																1502	467	690	23		
PERCENT (%)																60.92	18.82	19.74	0.91		

Table 3.2-73

Analysis of variance (three-way, factorial design) results for logarithmically transformed ichthyoplankton densities taken at 14 stations in York Haven Pond, 1982. Means (x) denotes factors significantly different at $P \leq 0.05$.

Source of Variation	df	SS	MS	F
Date	16	194.58	12.16	106.17*
Station	13	94.02	7.23	63.62*
Replicate	1	0.01	0.01	0.72
Date-Station Interaction	208	89.61	0.43	3.74*
Date-Replicate Interaction	16	0.62	0.04	0.37
Station-Replicate Interaction	13	0.88	0.07	0.61
Residual (Error)	208	9.29	0.04	
Total	475	239.01		

Table 3.2-74

Results of the Student-Newman-Keuls multiple range test on logarithmically transformed densities of ichthyoplankton taken at 14 stations at night in York Haven Pond, 1982. Means underlined were not significantly different at $P \leq 0.05$.

DATES:	May 4	May 24	Jun 10	Jun 6	Jun 15	Jun 3	Jun 22-23	Jun 10	Jun 18	Jun 11	Jun 23	Jun 30	Jun 2	Jun 18	Jun 25	Jun 20	Jun 19
	<u>0.33</u>	<u>0.86</u>	<u>0.87</u>	<u>0.91</u>	<u>0.93</u>	<u>1.22</u>	<u>1.29</u>	<u>1.41</u>	<u>1.46</u>	<u>1.55</u>	<u>1.64</u>	<u>1.65</u>	<u>1.78</u>	<u>1.79</u>	<u>1.82</u>	<u>1.83</u>	<u>2.26</u>

STATIONS:	1981	13A1	10B1	16A1	12A1	181	8B1	12B1	10B3	14A1	13A2	10B2	16B1	
	<u>1.00</u>	<u>3.03</u>	<u>1.04</u>	<u>1.23</u>	<u>1.26</u>	<u>1.31</u>	<u>1.43</u>	<u>1.44</u>	<u>1.45</u>	<u>1.46</u>	<u>1.49</u>	<u>1.58</u>	<u>1.71</u>	<u>2.01</u>

* Prefix TN-LF- deleted from table.

Table 3.2-75

Comparison of predicted (\hat{Y}_D) and observed (Y_D) day densities of ichthyoplankton taken weekly (April through August) in York Haven Pond in 1982, based on observed night densities (X) and the model $\hat{Y}_D = 0.75 + 1.002(X)$.

Date	Observed Night (X)	Observed Day (Y_D)	Predicted Day (\hat{Y}_D)	Residual ($Y_D - \hat{Y}_D$)
Apr 27	0.837	0.900	0.889	+0.010
May 4	1.993	0.883	1.247	-0.364
May 11	3.201	1.661	2.638	-0.977
May 18	3.933	2.517	3.191	-0.674
May 25	3.393	2.607	2.850	+0.043
Jun 2	3.404	2.980	2.661	+0.319
Jun 10	2.438	2.635	1.693	+0.942
Jun 15	2.517	2.131	1.772	+0.359
Jun 22-23	2.803	1.851	2.038	-0.207
Jun 30	3.333	2.309	2.590	-0.281
Jul 6	2.589	1.747	1.866	-0.119
Jul 13	3.441	3.156	2.698	+0.458
Jul 20	3.573	3.335	2.830	+0.506
Jul 27	3.536	3.257	2.793	+0.464
Aug 3	3.122	2.993	2.378	+0.615
Aug 10	3.207	2.440	2.467	-0.027
Aug 16	3.174	2.238	2.432	-0.194
Aug 24	2.802	1.837	2.138	-0.301

Table 3.2-76

Comparison of predicted (\hat{Y}_D) and observed (Y_D) densities ($16/100 \text{ m}^3$) of ichthyoplankton taken at station TN-LF-11A1 (TNHS Discharge) at night in York Haven Pond in 1982 based on densities upstream at Stations 13A2 (X_1) and 16A1 (X_2) and the model $\hat{Y}_D = -1.1 + 0.219(X_1) + 0.503(X_2)$.

Date	Observed 13A2 (X_1)	Observed 16A1 (X_2)	Observed 11A1 (Y_D)	Predicted 11A1 (\hat{Y}_D)	Residual ($Y_D - \hat{Y}_D$)
May 4	4.65	-	2.72	-0.07	2.79
May 11	154.27	111.20	150.08	99.47	50.61
May 18	371.90	617.67	336.21	487.85	-151.64
May 25	91.04	127.67	170.84	96.08	74.76
Jun 2	717.02	64.67	191.39	107.48	83.91
Jun 10	12.39	2.92	4.51	3.38	1.14
Jun 15	31.16	8.84	7.36	11.02	-3.66
Jun 22-23	32.36	9.30	21.88	15.89	5.99
Jun 30	48.05	102.01	82.77	71.14	11.63
Jul 6	16.83	6.94	9.10	6.81	2.29
Jul 13	74.36	12.83	17.34	22.96	-5.62
Jul 20	32.42	28.32	36.00	23.13	12.87
Jul 27	51.96	19.69	30.08	32.14	-2.07
Aug 3	26.64	8.64	29.07	9.96	19.11
Aug 10	20.07	5.7	36.20	6.83	29.37
Aug 16	14.00	-	19.64	14.68	4.96
Aug 24	3.01	-	7.29	0.47	6.82
MEAN			76.03	63.12	12.91

Table 3.3-7

Percentage similarity indices of species composition among ichthyoplankton tows net stations in York Haven Pond sampled one week night in 1982. Prefix TN-15* deleted from station numbers in table.

		DAY																
		188	188*	181	181*	183	183*	186	186*	188	188*	189	189*	191	191*	193	193*	
NIGHT	1481		31.47	27.27	27.90	31.05	18.17	42.26	75.82	38.70	49.67	56.52	48.83	49.44	55.83			
	1581	36.42		66.70	25.47	33.78	65.96	45.84	13.90	61.57	80.25	39.88	58.19	60.72	48.47			
	181	14.83	43.48		23.18	43.27	58.36	52.35	8.44	59.84	50.89	38.04	51.05	64.90	52.38			
	1281	71.83	42.98	35.05		33.38	19.07	46.95	80.12	32.22	45.57	58.50	43.27	51.79	57.61			
	1241	17.44	48.10	40.11	40.12		51.84	49.47	23.30	55.02	59.84	52.52	43.32	56.01	46.42			
	1341	43.18	57.01	78.97	35.55	43.31		46.42	6.22	53.07	7.08	41.05	43.23	52.61	53.03			
	1361	17.20	58.12	67.72	37.99	41.32	71.71		33.48	48.66	55.99	71.11	58.62	68.90	72.68			
	481	87.43	12.17	23.43	78.23	20.14	22.83	27.88		17.53	29.69	44.25	29.82	32.18	40.02			
	1081	79.29	36.38	30.69	89.74	32.31	30.20	32.06	87.06		73.08	47.63	54.78	53.88	49.47			
	1082	24.88	44.88	60.25	47.68	82.29	58.03	61.84	53.68	42.74		62.90	64.30	81.87	55.93			
	1983	55.12	43.28	59.25	35.95	20.74	58.09	63.92	44.48	22.44	74.77		43.20	59.17	65.61			
	881	16.88	43.64	68.85	33.08	41.47	78.90	67.83	23.99	31.80	61.57	61.77		73.82	62.25			
	1141	17.84	34.99	39.72	31.98	43.43	73.21	91.40	27.86	23.59	43.08	64.79	72.50		72.64			
	1681	13.01	40.00	83.43	32.15	39.58	77.28	76.02	23.48	28.78	57.58	60.84	84.99	78.14				

Table 3.3-1

Comparison of weekly ichthyoplankton densities (#/100 m³) taken at night in York Haven Pond, 1974 through 1982. Weeks indicated by Roman numerals.

	APRIL			MAY					JUNE				
	II	III	IV	I	II	III	IV	V	I	II	III	IV	V
1982			0.01	3.48	56.74	304.06	48.53		80.51	6.76	11.90	22.63	76.89
1981	0.30	1.84	3.85	23.06	107.32	194.43	375.61		300.69	227.13	43.44	54.94	33.51
1980		0.30	0.44	9.36	82.91	159.38	127.82		455.20	186.43	151.92	118.97	
1979	0.10	0.10		3.23	43.78	478.89	174.88	5.04	177.37	178.45	117.51	82.26	
1978				0.40	2.95			18.60	182.58	497.92	409.25	208.38	229.30
1977	0.08	10.84		22.94	89.71	147.11	690.91	294.93	168.35	184.89	55.38	63.44	
1976	0.25	10.38	24.78	63.58	66.49	367.92	227.91		260.12	140.13	302.96	97.19	

Table 3.3-1 continued.

	JULY					AUGUST					GRAND MEAN
	I	II	III	IV	V	I	II	III	IV	V	
1982	13.83	170.04	490.85	194.11		47.26	57.48	53.50	28.44		93.64
1981	64.13	114.86	226.92	123.44		71.61	25.04	99.88	47.80		107.98
1980	202.94	154.33	74.66	73.15	64.85	48.13	28.16	16.59	7.95		103.34
1979	30.14	57.09	292.91	65.07	51.62	25.53	14.15	32.64	8.22		61.30
1978	55.42	41.14	118.13	68.79		44.79	15.63	3.18	6.97	7.38	124.22
1977	39.00	33.58	22.71	16.29		8.05	17.18	17.61	9.47	1.31	94.74
1976	28.61	68.64	71.79	49.76	118.65	161.47	24.29	80.04	15.40		108.89

Table 3.3-2

senary number, ♀ and percent, % of the most common ichthyoplankton taxa and families (includes taxa not represented) taken during the day (D) and at night (N) in back bay area from 1976 through 1987. Day sampling was initiated in 1978. T denotes total day and night values.

	1976		1977		1978		1979		1980		1981		1982	
	D	%	D	%	D	%	D	%	D	%	D	%	D	%
<i>Centropomidae</i>														
D	2367	17.66	5227	31.69	1313	37.25	374	9.10	1342	26.47	76	2.78	156	5.89
N					6903	33.16	6281	23.93	3505	20.50	295	1.83	2135	13.58
T					6216	33.76	6811	23.30	4807	21.32	668	1.86	3281	17.22
D	1867	9.72	1866	11.72	285	7.82	102	2.63	54	1.25	266	8.69	71	2.31
N					2875	13.81	1628	8.10	412	4.66	412	4.66	951	5.81
T					3140	12.90	1728	7.95	866	3.97	5987	16.78	2002	5.25
D	3865	20.36	1203	7.25	879	4.27	829	4.83	1337	8.79	5086	13.73	1786	11.36
N					1497	6.14	786	3.21	1665	7.66	5175	12.00	1087	6.61
T					2376	9.41	1615	6.04	3002	10.45	10261	25.73	2873	17.97
D	8509	45.78	8030	31.25	14078	51.27	6863	18.36	3921	11.87	14437	33.28	6055	37.82
N					12872	51.25	7661	25.25	7726	23.41	12152	35.11	5281	26.18
T					26950	102.50	14521	43.61	11697	34.86	26583	68.39	11336	63.99
D	3766	18.36	1361	8.20	6547	23.86	3723	10.00	2575	14.72	2861	13.35	1326	8.33
N					4818	19.79	3385	18.01	2708	12.00	732	3.26	1402	7.35
T					8365	38.15	7108	36.01	5283	26.72	3293	16.61	2728	15.68
D	3953	20.78	2166	13.05	6829	23.30	4203	13.49	2786	15.71	3143	16.82	1553	9.70
N					5224	21.85	2905	12.52	2567	13.69	2776	12.67	1752	10.52
T					9153	43.63	7134	25.97	5352	27.38	5919	29.48	3305	20.22
D	2870	15.11	4240	25.54	323	1.01	4172	13.32	4062	16.46	3193	16.90	7305	43.82
N					2528	10.38	8289	26.93	8289	38.02	8026	20.39	9320	48.85
T					5398	15.49	13461	40.47	12351	44.48	11219	37.29	16625	92.67
D	3625	19.08	4357	26.25	2265	10.79	4097	14.57	4166	15.16	3387	15.81	7632	46.62
N					2280	11.42	9322	30.02	8625	38.68	5326	21.21	9648	49.63
T					4545	22.84	13919	40.59	13291	53.85	8713	37.02	17280	96.25
D	772	4	666	4.01	276	1.33	1311	7.66	1278	7.29	1492	5.47	297	1.85
N					280	1.35	1368	6.34	1298	5.98	1520	5.59	300	1.78
T					403	2.56	2277	5.14	2489	9.02	3012	11.06	597	3.63
D	1659	7.77	243	1.46	1037	7.96	662	3.20	780	4.25	850	3.78	432	2.70
N					2534	10.54	899	4.14	1409	5.27	898	3.72	660	3.69
T					4193	18.31	1561	6.34	2187	10.42	1748	6.50	1092	6.39
D	2605	13.71	1080	6.30	1968	9.55	1111	31.80	2136	17.56	2323	11.82	680	3.00
N					2886	11.81	2387	11.05	2585	12.28	2487	11.42	1130	5.18
T					4854	21.52	3549	12.85	4721	20.08	4820	23.28	1810	8.18
D	19075		14601		3325		17893		13647		23427		14013	
N					20875		21750		21801		21162		13973	
T					54150		39643		35448		44589		27986	
D	19		30		26		23		20		19		30	
N					26		29		30		30		31	
T					52		52		50		49		61	

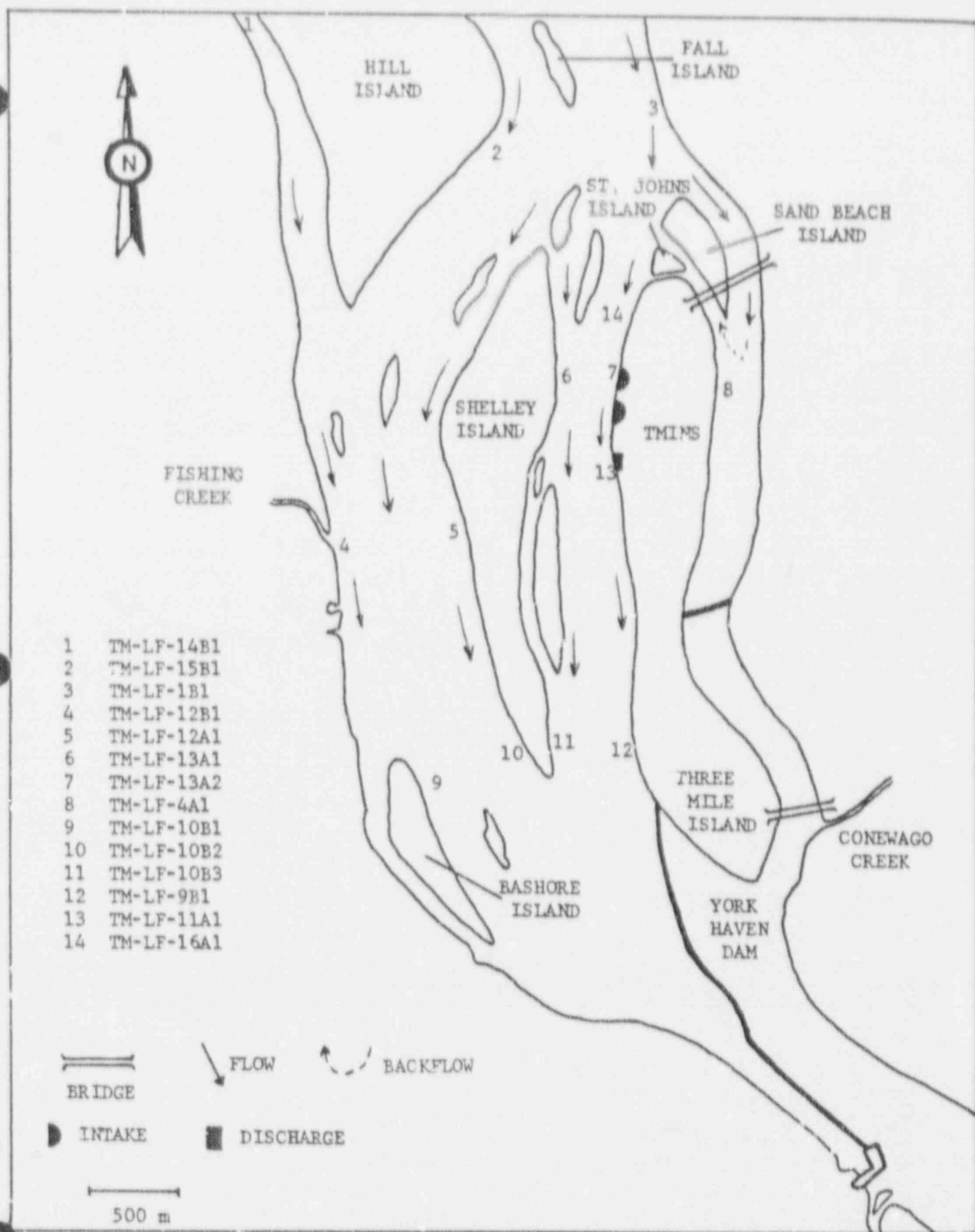


Figure 3.1-1. Location of ichthyoplankton push net stations sampled in York Haven Pond.

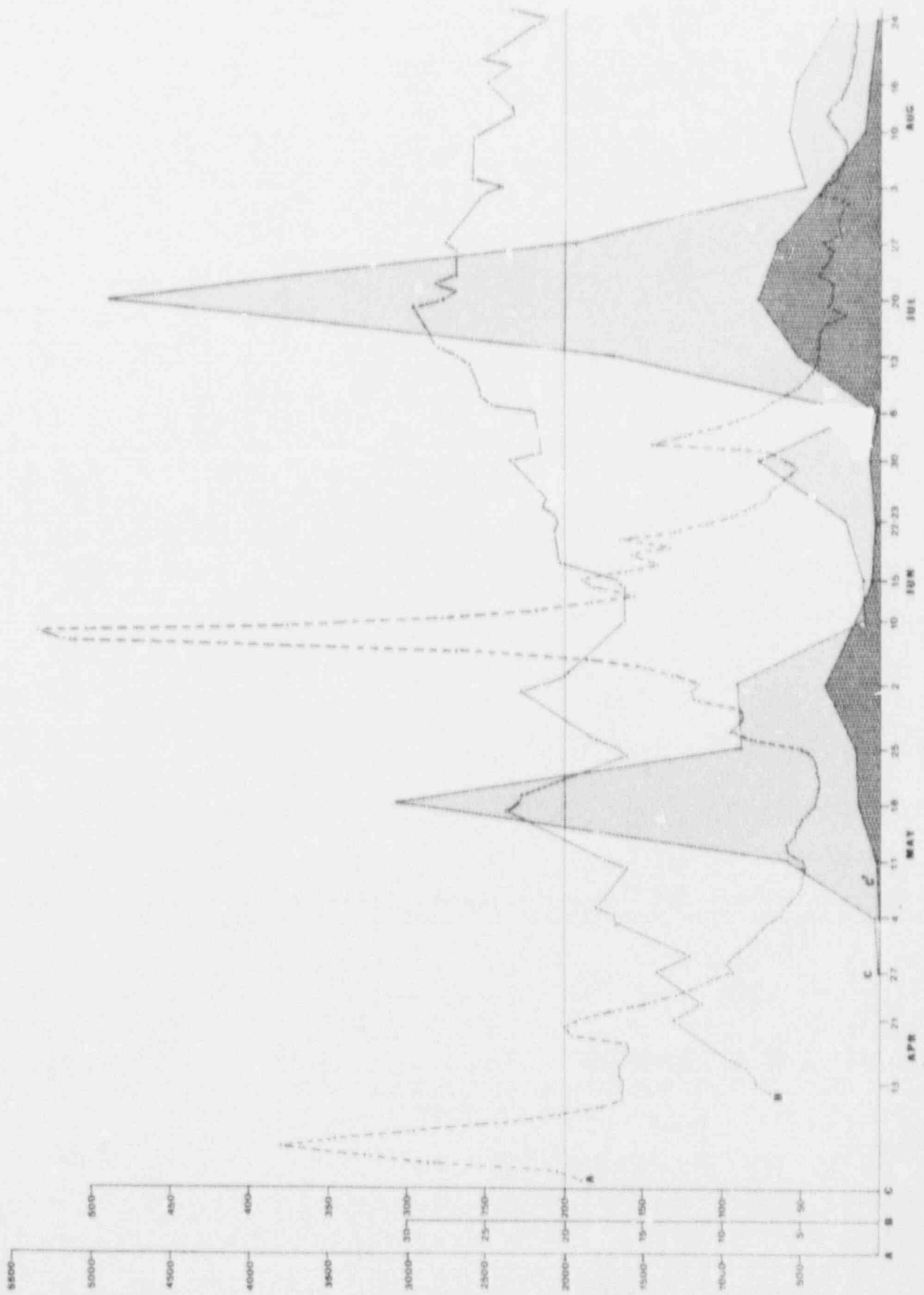


Figure 2.—River flow (A) in m^3/s , mean air temperature (B) in $^{\circ}C$, and mean ichthyoplankton density (C) in $1000\ m^3$, recorded from first sweep tow, April through August 1962. Line drawn at $20\ ^{\circ}C$ water temperature for reference.

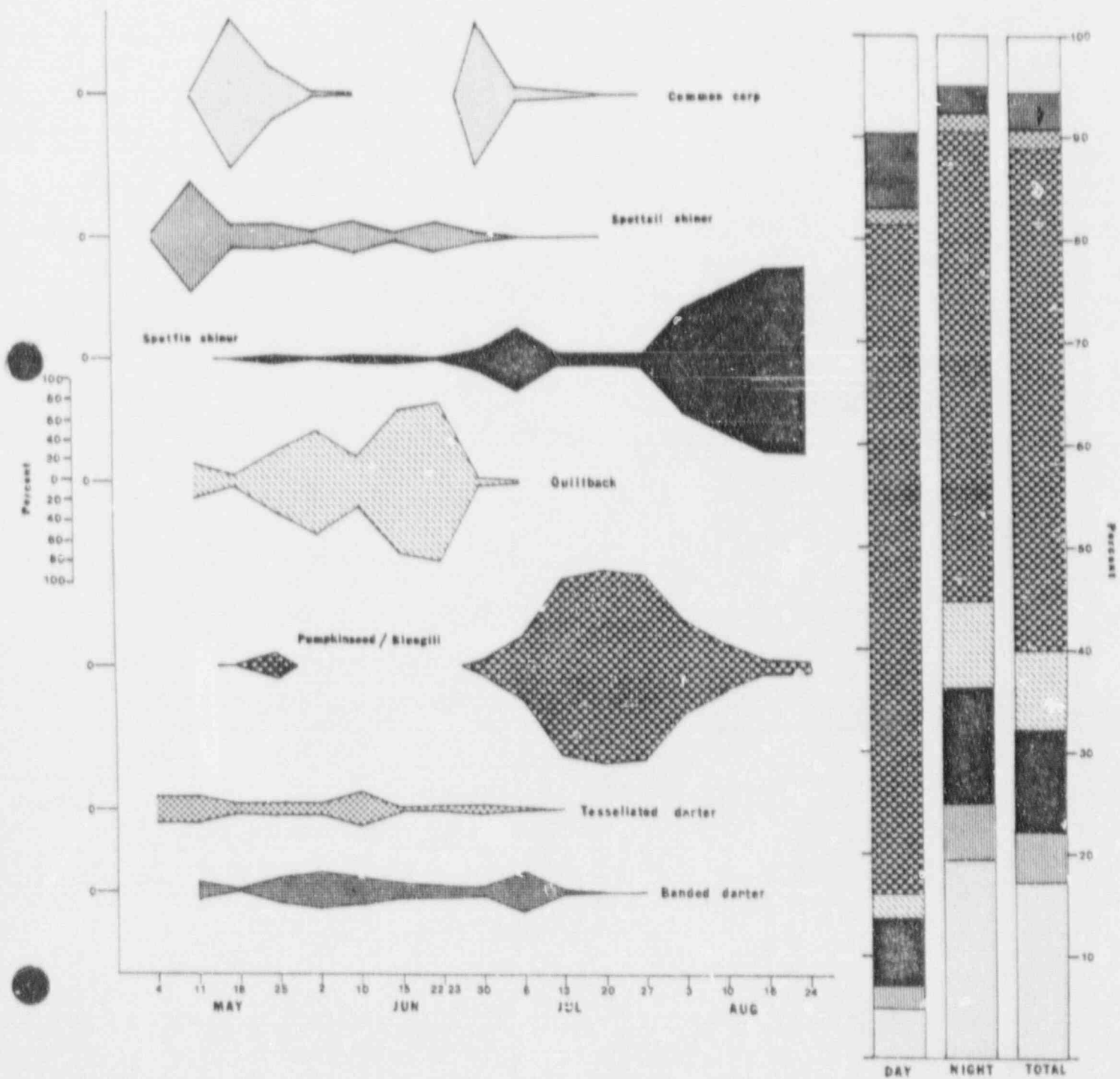


Figure 3.2-2. Percent composition of the seven most abundant ichthyoplankton taxa taken by date at night (white graph), and percent composition for day, night, and total ichthyoplankton (bar graph) in York Haven Pond, 1982.

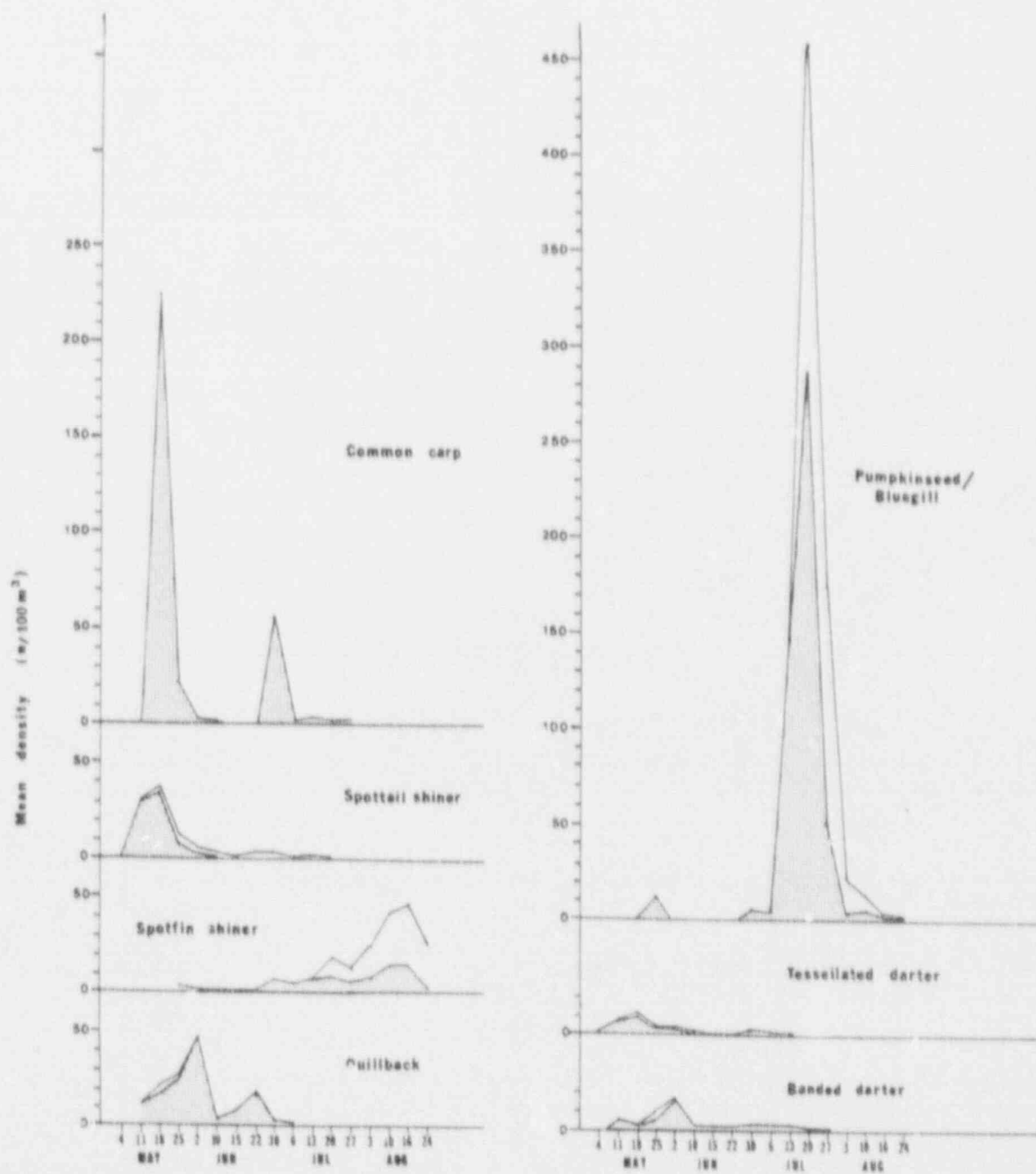


Figure 3.2-3. Mean density of the seven most abundant ichthyoplankton taxa taken at night in York Haven Pond, 1987. Shaded area indicates protelarvae; all other stages represented by clear area.

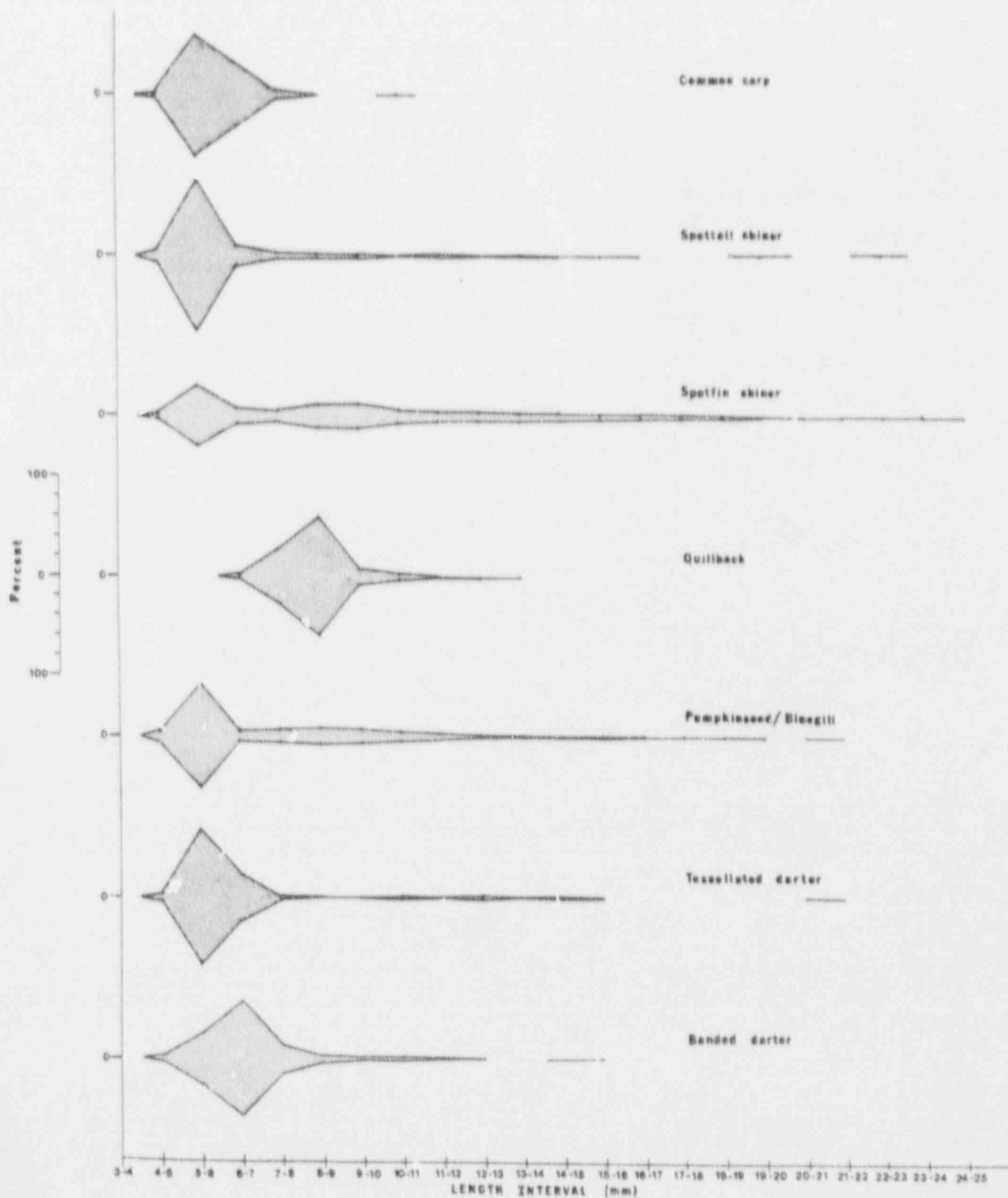


Figure 3.2-6. Representation of length intervals of the seven most abundant ichthyoplankton taxa taken at night in York Haven Pond, 1982.

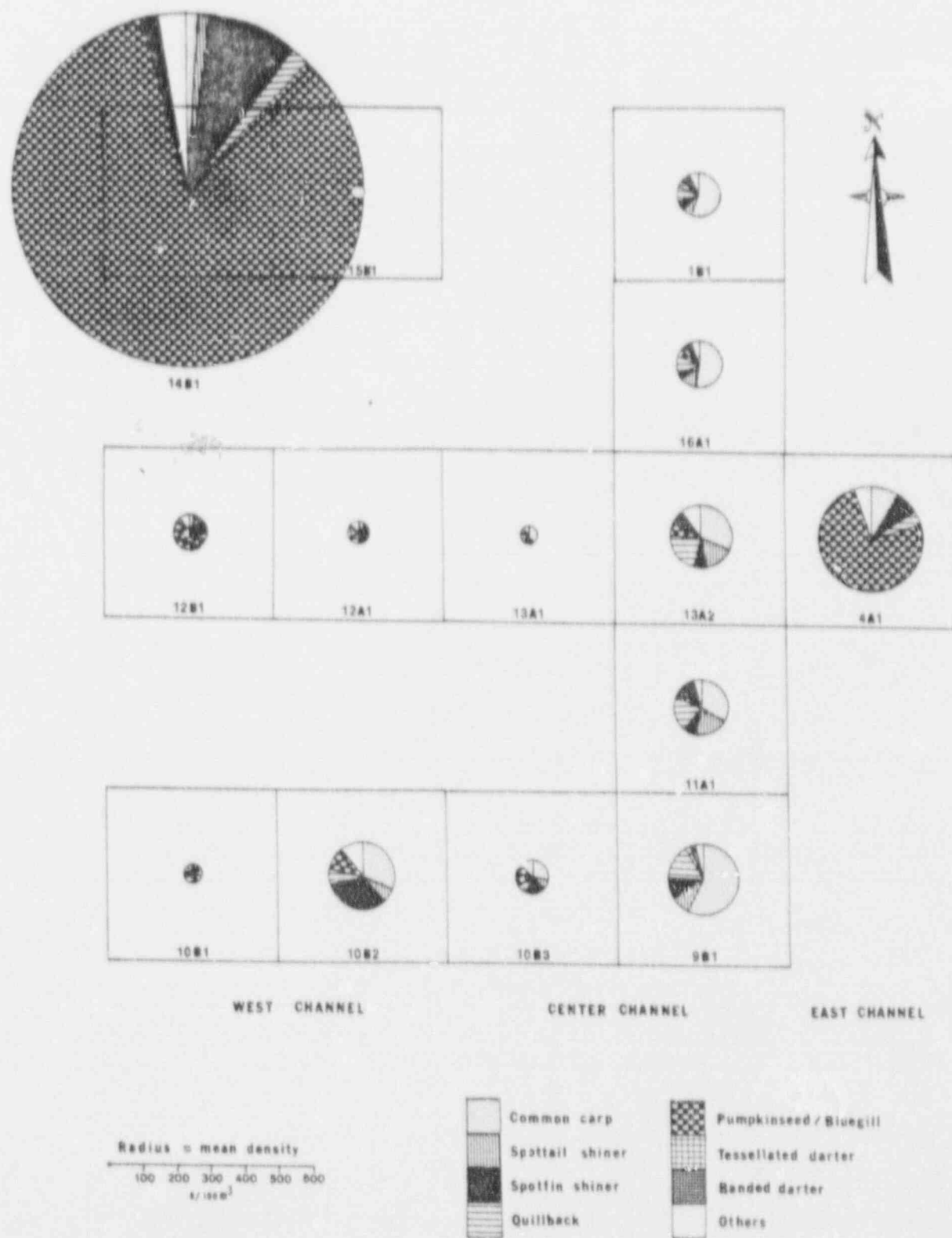


Figure 3.2-3. Spatial distribution of ichthyoplankton (mean density and percent composition) taken at night at 14 stations in York Haven Pond, 1982. Stations are geographically oriented.

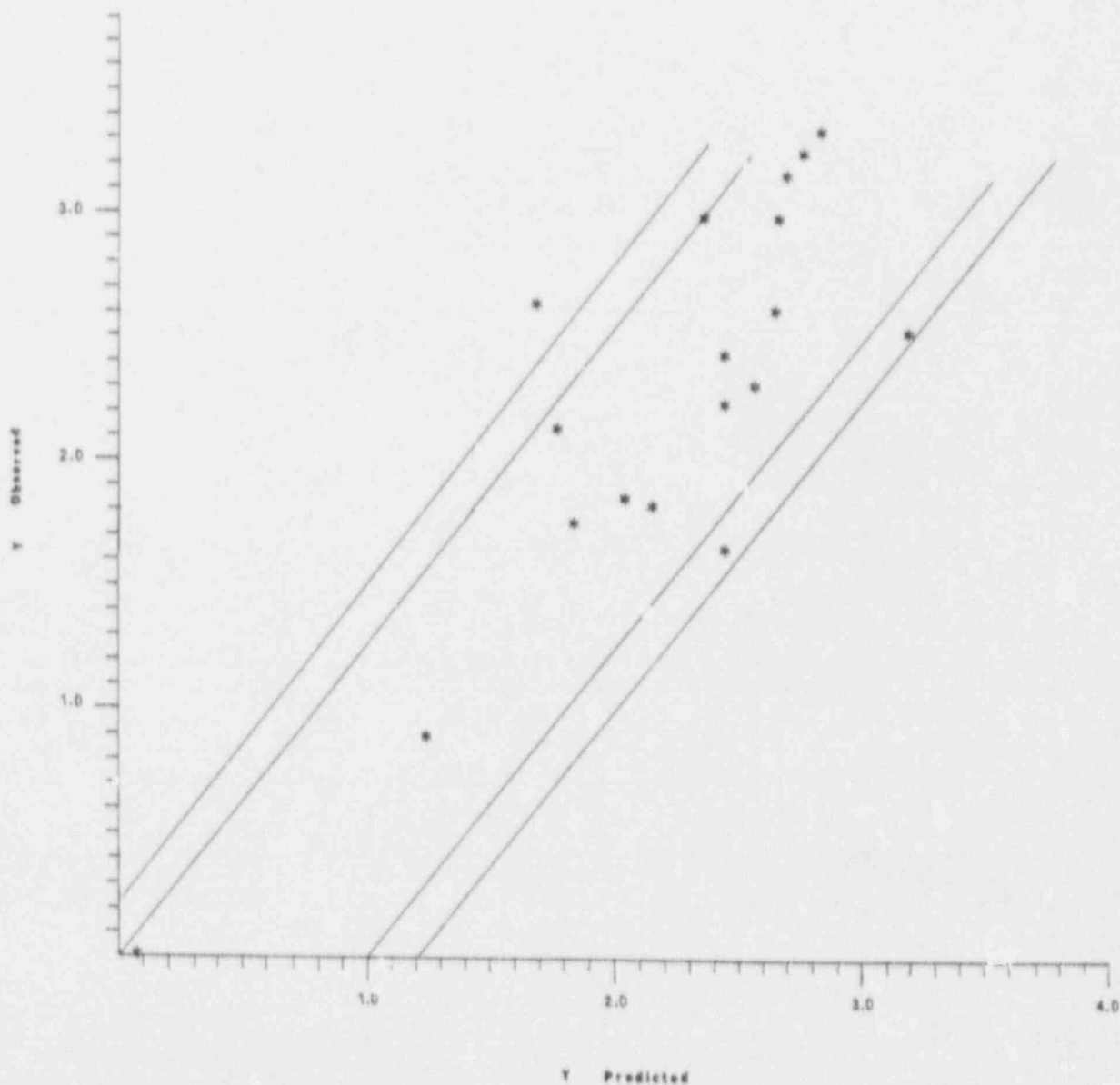


Figure 3.2-6. Comparison of the observed vs. predicted day log densities of ichthyoplankton based on night densities collected in 1982. The 90 and 95% confidence bands for previous data (1978-1980) are shown. Predictions were based on the equation given in Table 3.2-75.

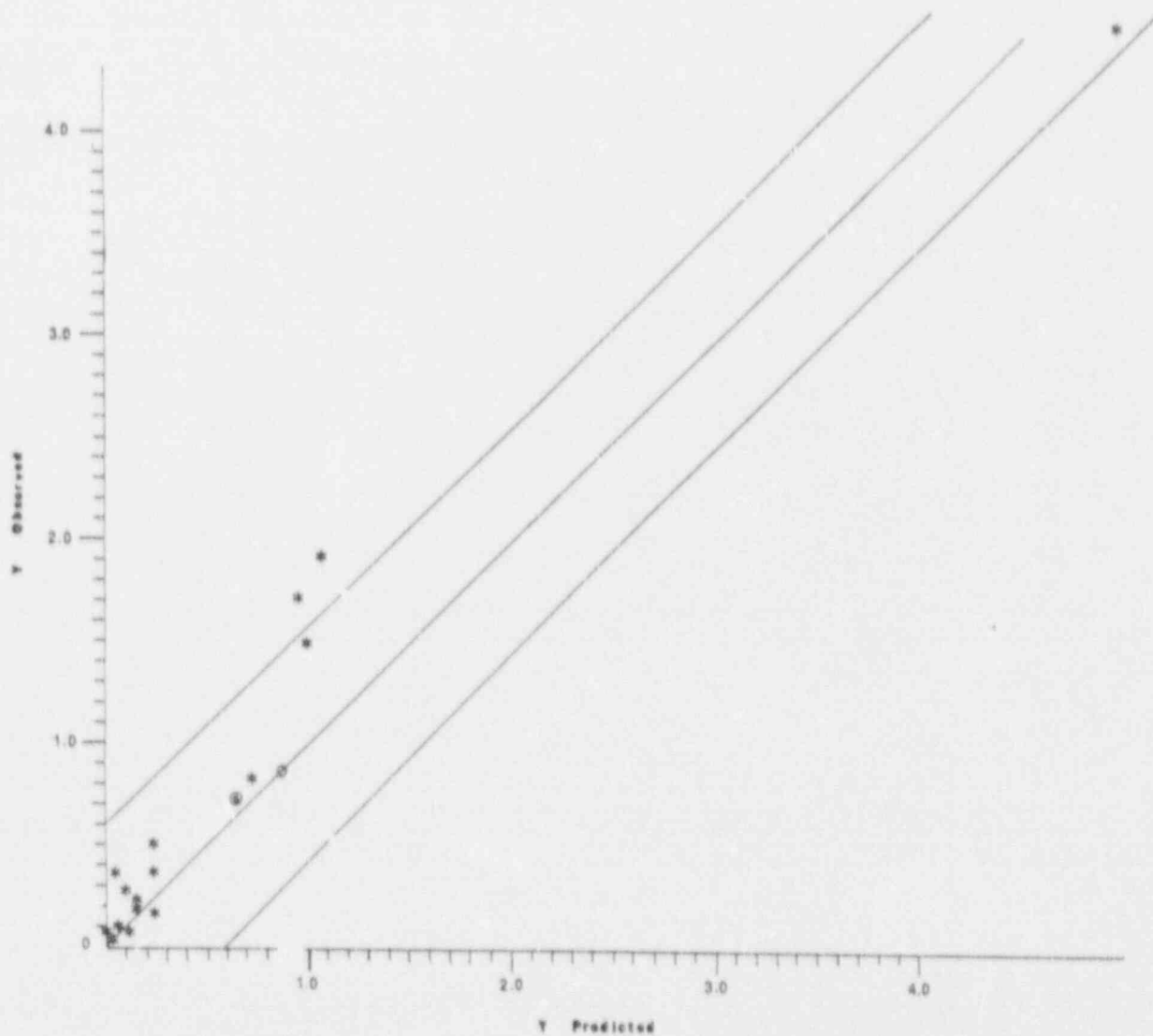


Figure 3.2-7. Comparison of the observed vs. predicted ichthyoplankton densities (m^3) at the TMDL discharge (Station 11A) collected in 1982. The 95% confidence band, regression line, and mean (open circle) are shown for previous data (1977-1980). The 1987 mean is indicated by the circled asterisk. Predictions were based on the equation given in Table 3.2-76.

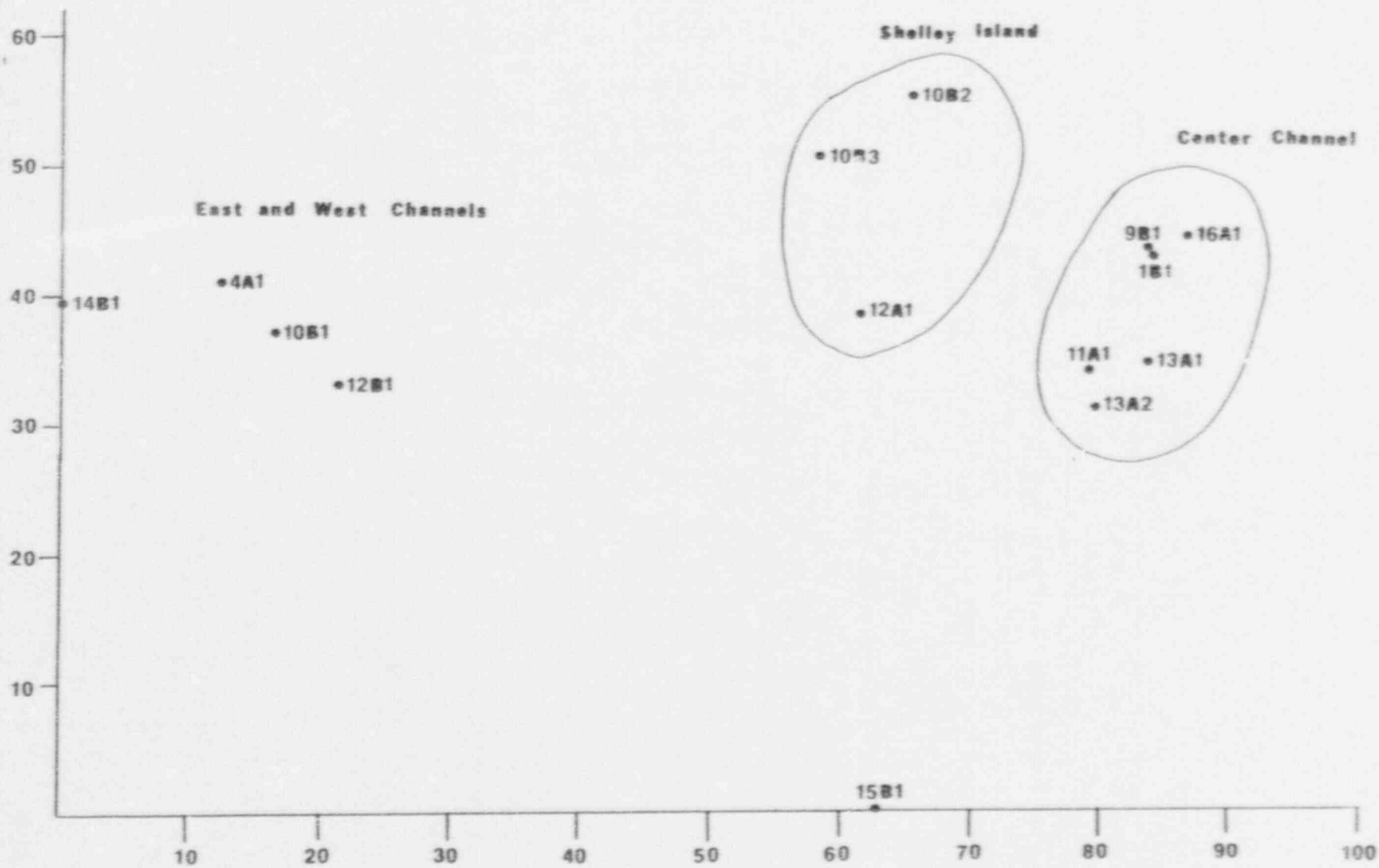


Figure 3.2-8. Ordination results showing community clusters among ichthyoplankton stations sampled at night in York Haven Pond in 1982.

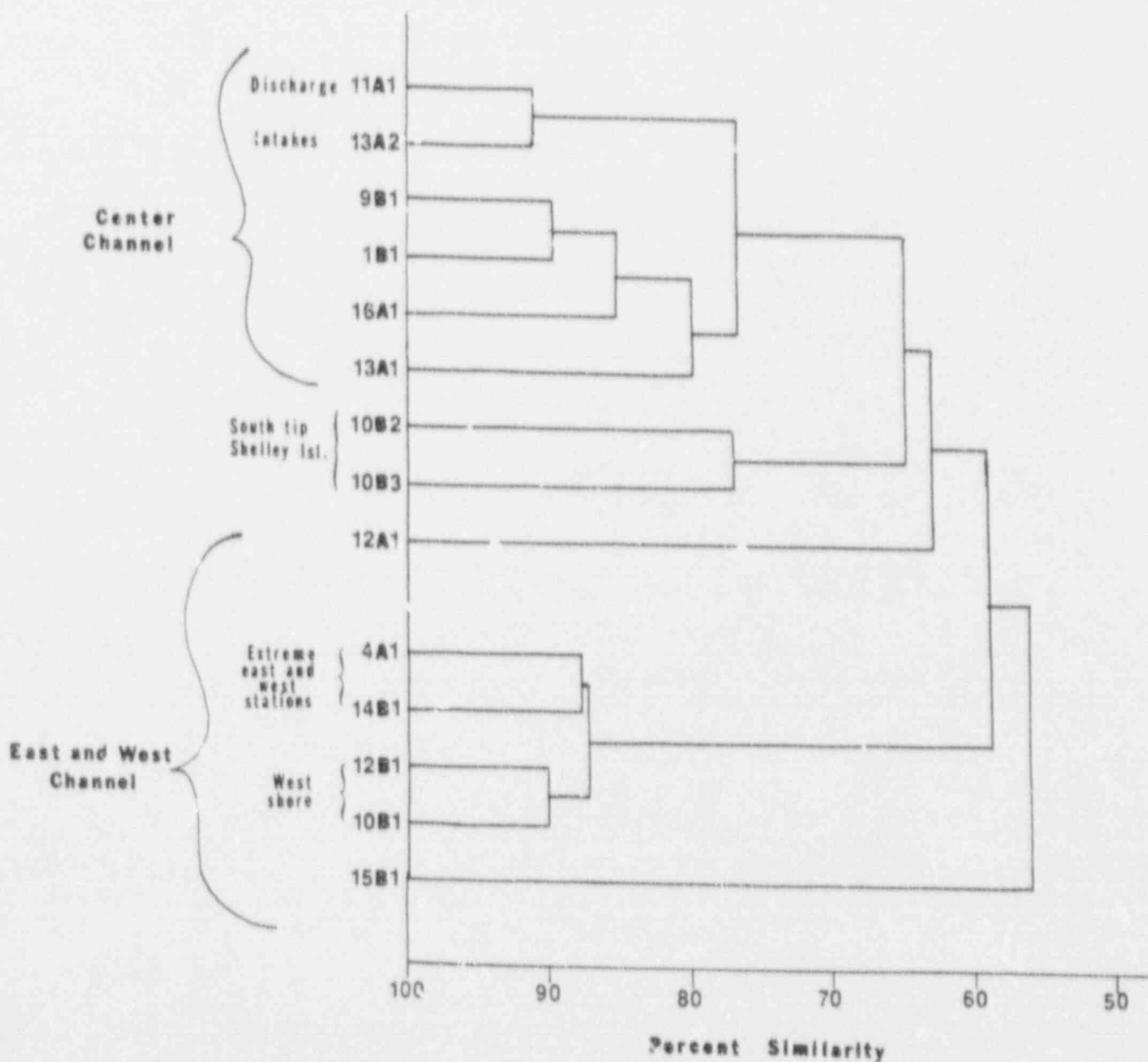


Figure 3.2-9. Single linkage dendrogram showing community similarity at the ichthyoplankton stations based on percent similarity (PSc) values for night samples taken in York Haven Pond, 1982.

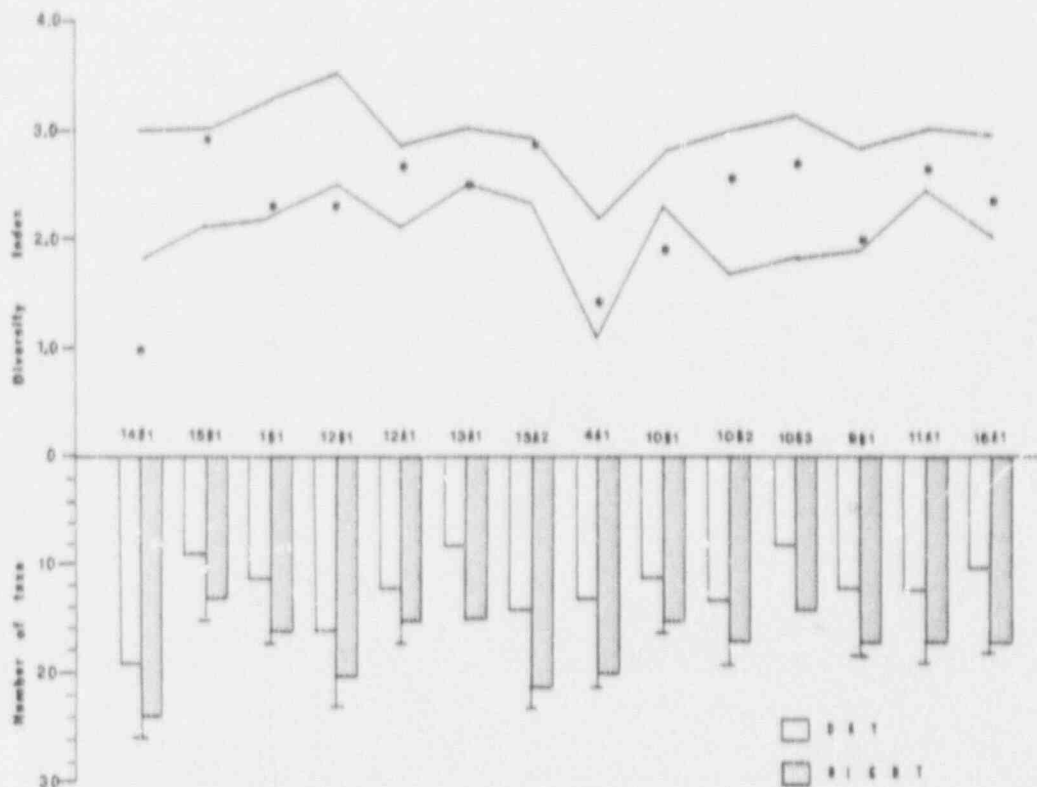


Figure 3.2-10: Night Diversity indices (*) and number of taxa at the 14 ichthyoplankton stations in York Haven Pond in 1982. Range of Diversity values for 1976 through 1981 indicated between lines. Total taxa indicated by a bar if greater than night data.

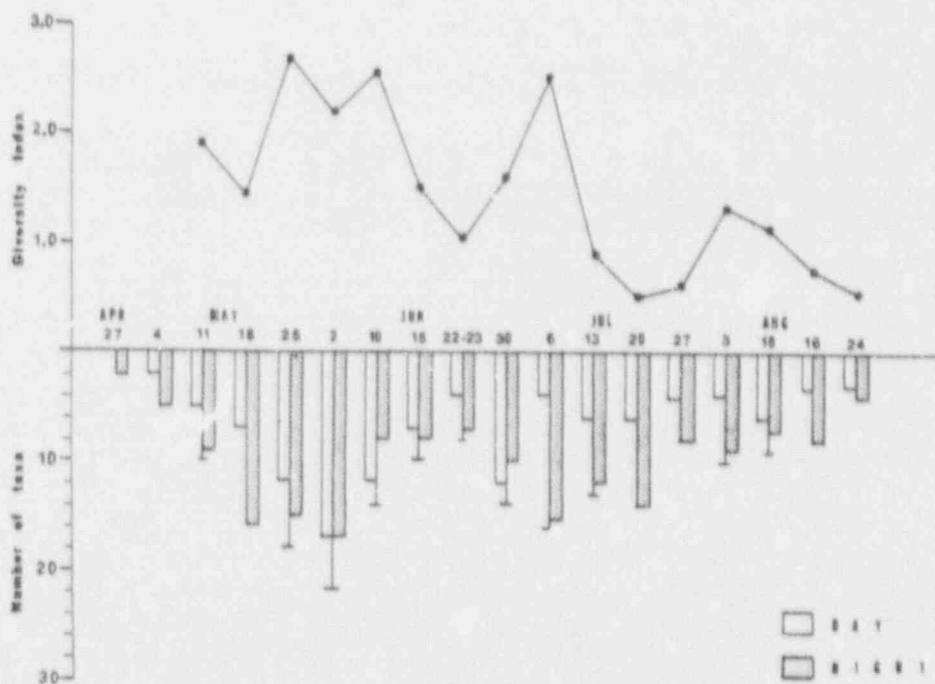


Figure 3.2-11: Night diversity indices and number of taxa taken by date in York Haven Pond in 1982. Total taxa indicated by a bar if greater than night data.

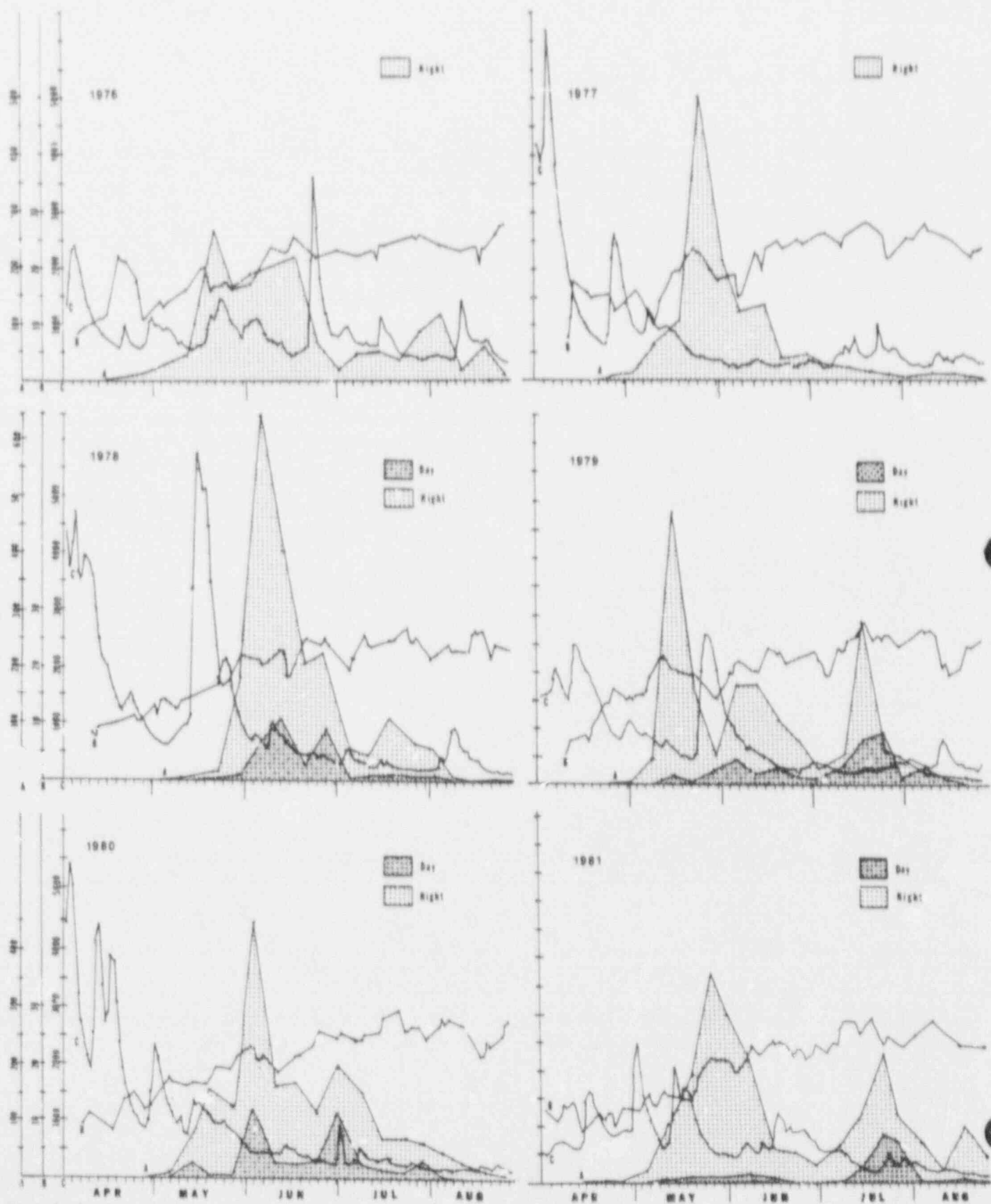


Figure 3.3-1. Mean density of ichthyoplankton ($n/100 m^3$, A), mean river temperature ($^{\circ}C$, B), and river flow (m^3/sec , C) recorded in York Haven Pond, 1976 through 1981. Refer to Figure 3.2-1 for 1982 data.

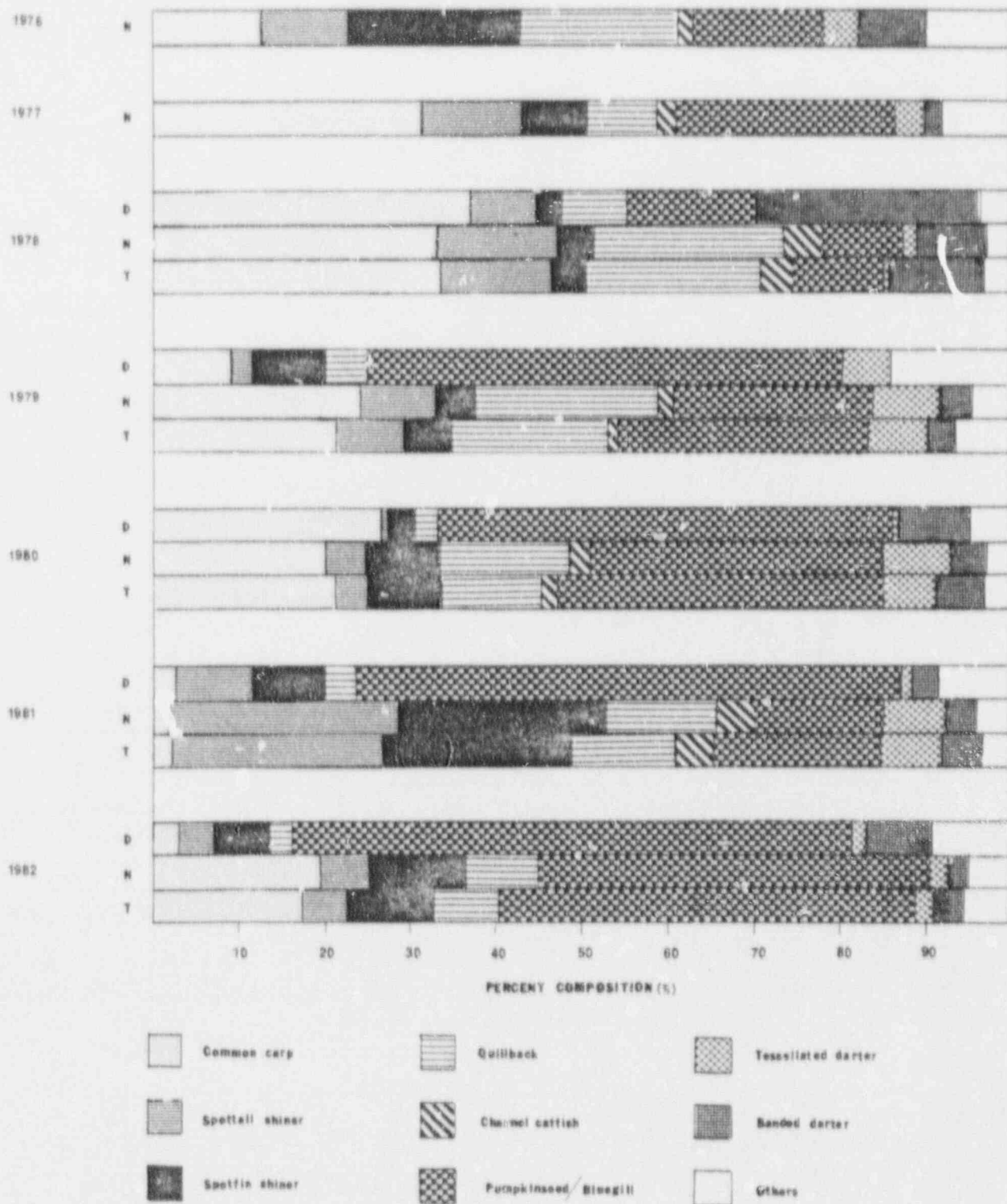


Figure 3.3-7. Percent composition of day (D), night (N), and total (T) ichthyoplankton taxa taken in York Haven Pond, 1976 through 1982.

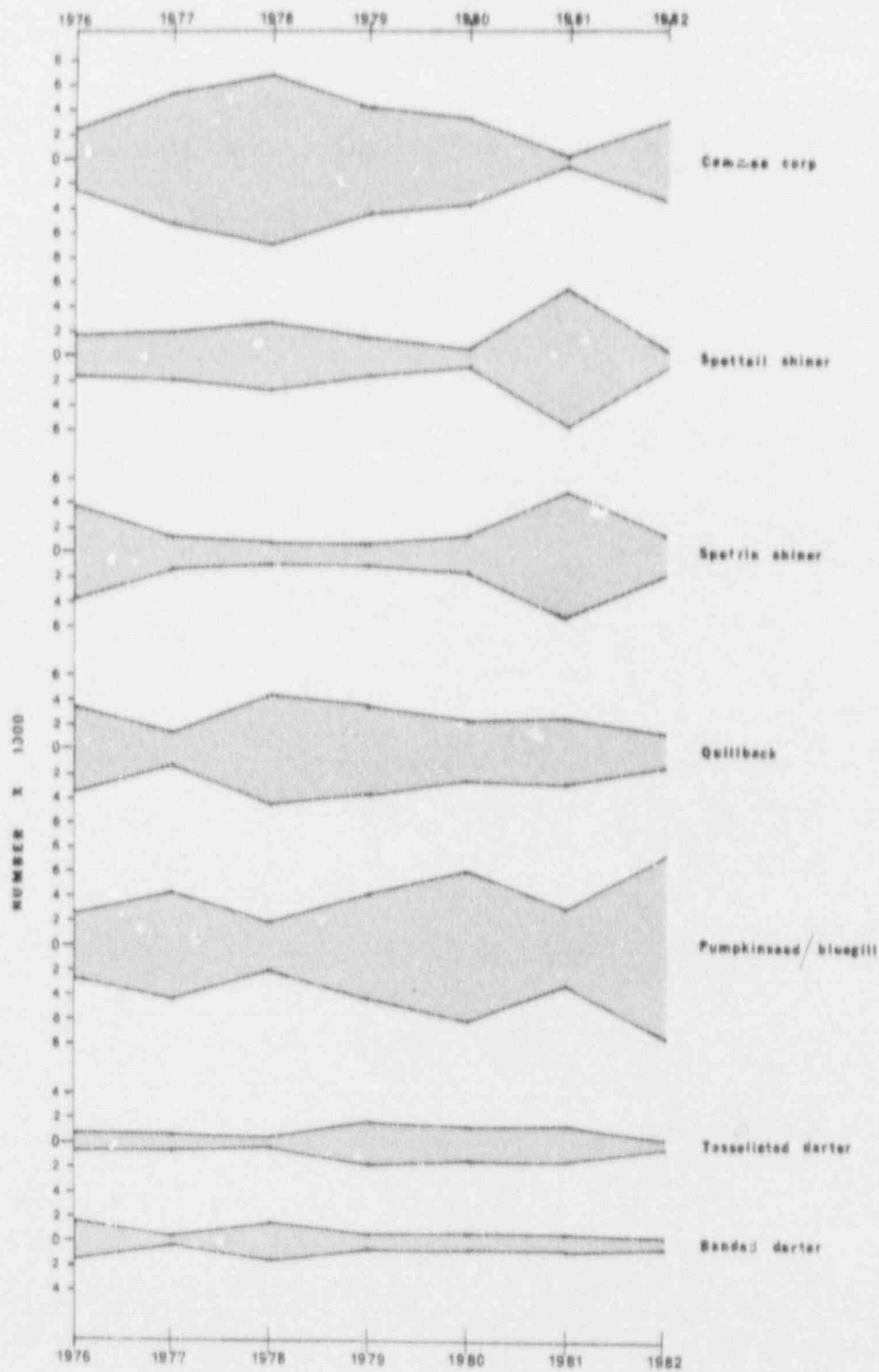


Figure 1.3-3. Yearly abundance of the major ichthyoplankton taxa taken at night in York Haven Pond, 1976 through 1982.

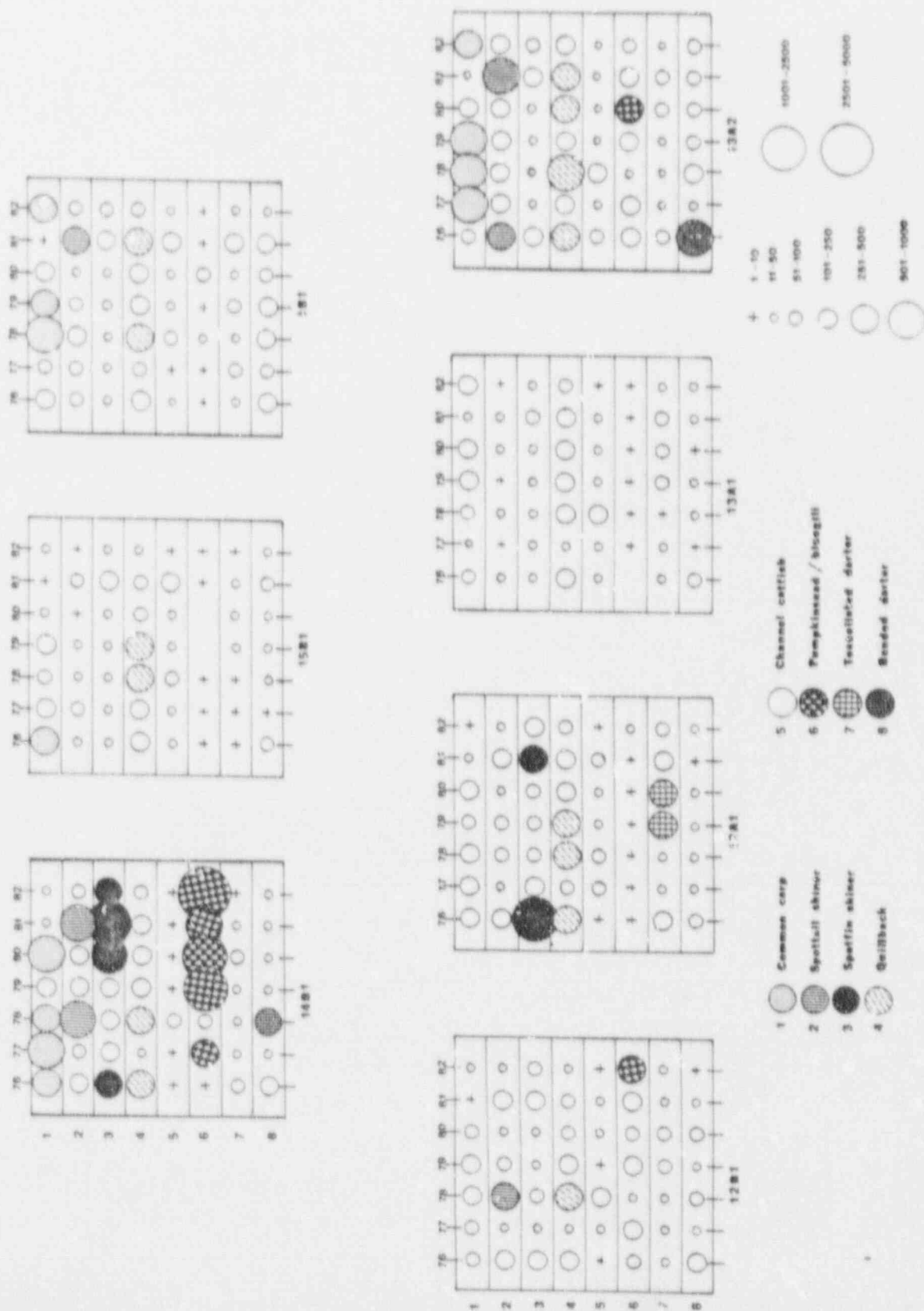


Figure 3.3-4. Yearly total numbers of eight trichopteran taxa taken at eight sites at York Haven Pond, 1976 through 1987. Station 1381 was not sampled in 1976. Taxa 1-8 are defined in the legend.

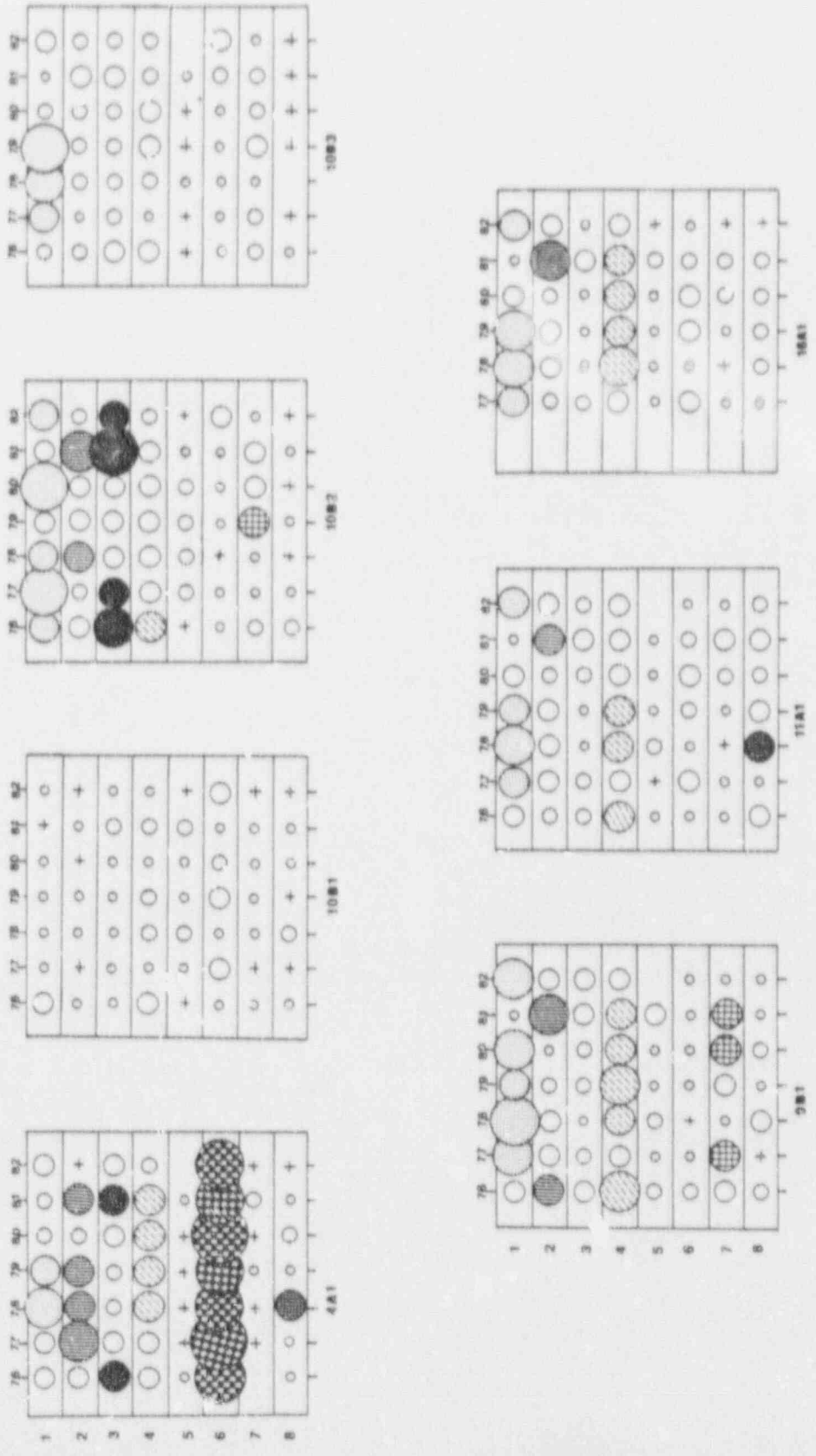


Figure 3.3-6, continued.

4.0 ENTRAINMENT OF ICHTHYOPLANKTON

The spatial and temporal distribution, abundance, and composition of ichthyoplankton in the TMINS Unit 1 and 2 Intake suction bays were investigated to assess and detect changes related to the Station.

4.1 METHODS

Entrainment studies in 1982 were conducted semimonthly, April through August in the Unit 1 and 2 Intake Buildings.

Replicate surface (2) and oblique (2) samples were taken at 6-hour intervals (1000, 1600, 2200, 0400 h) over a 24-hour period with 0.5 m plankton nets (0.5 mm mesh). The nets were manually towed across the Intake suction bays directly in front of the river water pumps (Figures 4.1-1 and 4.1-2). Oblique tows originated about 1.0 m from the bottom. The volume of water filtered was measured by a General Oceanics digital flowmeter mounted in the mouth of each net. Numbers of fish caught were standardized by conversion to density (fish per 100 cubic meters of water, $n/100 \text{ m}^3$). During each sample interval water temperature, dissolved oxygen, pH, and the number and type of river water pumps in operation were recorded at each Unit. River stage and flow for each sample interval were interpolated from data obtained from the River Forecast Center in Harrisburg, Pennsylvania.

Samples were immediately preserved in a 25% formalin solution. In the laboratory, specimens were separated from debris and stored in a 20% formalin solution for later identification. Specimens were identified with the aid of reference materials described in Section 3.0. All undamaged fish were identified to species when possible. Lepomis gibbosus and L. macrochirus less than 14.0 mm (total length, TL) were

generally indistinguishable and were grouped as L. gibbosus/L. macrochirus. Only fish from the current year's spawn less than or equal to 25.0 mm TL were considered ichthyoplankton.

A list of the ichthyoplankton collected is presented in Table 4.1-1. Scientific and common names and taxonomic order of presentation followed Robins et al. (1980).

Developmental terminology was defined by Snyder (1976). Larval stages were characterized by the presence of the finfold and lack of adult ray counts in all fins. The term young was used for fish of the current year's spawn which were fully transformed, and were characterized by complete absorption of the larval finfold and attainment of the adult compliment of rays and/or spines in all fins.

Analyses of variance (ANOVA) were performed to test for differences in total ichthyoplankton density with respect to year, date, time, unit, and replicate (Sokal and Rohlf 1969). Analyses were performed on untransformed densities of total ichthyoplankton. Individual taxa were present in insufficient numbers to warrant analysis. A density of $n/3 \text{ m}^3$ was used because it more closely approximated the sample size. Data from 1976 were excluded from the ANOVA because sampling in August was inconsistent with other years. The Student-Newman-Keuls multirange test (SNK) was used to determine which sample means were significantly different after an initial difference was indicated by ANOVA (Woolf 1968).

An index of percent similarity (described in Section 2.0) was computed to identify likenesses between depths and times with respect to species composition. This is an empirical index and measures relative similarity

in terms of species composition and generally leads to the grouping of communities by dominant or major taxa.

The Susquehanna River at Transect TM-LF-13A3 is divided into three channels (east, center, and west) (Figure 4.1-3). The estimated proportion of total river flow carried in each channel over various river flow conditions was reported in Brown and McQuivey (1980, 1981) and Brown et al. (1982). Channel proportions reported in Brown and McQuivey (1981) were 4, 42, and 54% for the east, center, and west channels, respectively. These proportions were used to estimate center channel flow, since river discharge in Brown and McQuivey (1981) ($680 \text{ m}^3/\text{s}$) most closely approximated discharges encountered during entrainment studies. River flow at the River Forecast Center in Harrisburg, Pennsylvania, ranged from 151 to $1,770 \text{ m}^3/\text{s}$ on 1982 entrainment dates.

The river flow rate for the center channel was estimated from data obtained from the River Forecast Center. Flow rate was estimated in $100 \text{ m}^3/\text{min}$ units to facilitate subsequent calculation of fish per minute; flow rate ($100 \text{ m}^3/\text{min}$) multiplied by density ($n/100 \text{ m}^3$) resulted in number of fish per minute. Flow rates were calculated for day (0700 to 1900 h, day 1) and night (1900 h, day 1 to 0700 h, day 2) periods from the formula:

$$F_c (\text{day}) = 0.42 [(F_{0700} + F_{1900})/2]$$

$$F_c (\text{night}) = 0.42 [(F_{1900} + F_{0700})/2]$$

where F_c = the flow rate for the center channel ($100 \text{ m}^3/\text{min}$), F_{0700} = the river flow ($100 \text{ m}^3/\text{min}$) at 0700 (day 1 or day 2) at Harrisburg, and

F_{1900} = the river flow at 1900 h at Harrisburg. The constant 0.42 was assumed to be valid for the range of river flows encountered during entrainment studies; it was derived from data presented in Brown and McQuivey (1981).

The center channel at Transect TM-LF-13A3 was subdivided into four zones (Table 4.1-2 and Figure 4.1-3). The flow rate for each zone was estimated from the flow rate of the center channel and the cross sectional area of each zone. The flow rate was calculated from the formula:

$$F_j = (A_j / \sum_{j=1}^j A_j) F_c$$

where F_j = the flow rate in zone j ($100 \text{ m}^3/\text{min}$) and A_j = the cross sectional area of zone j (m^2).

Zone widths were established to insure that the flow in Zone I was greater than the TMS influent. Assuming that only Zone I ichthyoplankton can be entrained, a discussion of the net effect upon the Zone I ichthyoplankton is possible.

The mean density of ichthyoplankton in each zone was estimated from concurrent data obtained from nearshore Stations 13A1 and 13A2 of the ichthyoplankton program (described in Section 3.0) and data from midchannel Station 13A4. Station 13A4 was sampled in conjunction with the ichthyoplankton push net collections (Table 4.1-3 and Figure 4.1-3).

The mean ichthyoplankton density ($n/100 \text{ m}^3$) in Zones I and IV was assumed to be the ichthyoplankton density at Stations 13A2 and

13A1, respectively. The mean density ($n/100 \text{ m}^3$) of ichthyoplankton in Zones II and III was calculated from the formulas:

$$N_{II} = (N_{13A2} + N_{13A4})/2$$

$$N_{III} = (N_{13A1} + N_{13A4})/2$$

where N_{II} = the mean density ($n/100 \text{ m}^3$) of ichthyoplankton in Zone II, N_{III} = the mean density of ichthyoplankton in Zone III, N_{13A2} = the density of ichthyoplankton at Station 13A2, N_{13A1} = the density of ichthyoplankton at Station 13A1, and N_{13A4} = the density of ichthyoplankton at Station 13A4.

The average intake flow rate for TMINS Units 1 and 2 was calculated for day (0700 to 1900 h) and night (1900 to 0700 h) periods from the formulas:

$$F_1 \text{ or } F_{ii} \text{ (day)} = \left(\sum_{p=1}^P C_p \cdot 1000 \text{ h} + \sum_{p=1}^P C_p \cdot 1600 \text{ h} \right) / 2$$

$$F_1 \text{ or } F_{ii} \text{ (night)} = \left(\sum_{p=1}^P C_p \cdot 2200 \text{ h} + \sum_{p=1}^P C_p \cdot 0400 \text{ h} \right) / 2$$

where F_1 or F_{ii} = the average intake flow rate ($100 \text{ m}^3/\text{min}$) at Unit 1 or Unit 2, respectively; p = the total number of river water pumps in operation for each sample period; and C_p = the rated capacity of each river water pump ($100 \text{ m}^3/\text{min}$).

The mean density of ichthyoplankton in Units 1 and 2 taken in oblique tows during day (1000 and 1600 h) or night (2200 and 0400 h) collections was calculated from the formulas:

$$N \text{ (day)} = \left\{ [(N_1 + N_2)/2 \text{ 1000 h}] + [(N_1 + N_2)/2 \text{ 1600 h}] \right\} / 2$$

$$N \text{ (night)} = \left\{ [(N_1 + N_2)/2 \text{ 2200 h}] + [(N_1 + N_2)/2 \text{ 0400 h}] \right\} / 2$$

where N = the mean density ($n/100 \text{ m}^3$) of ichthyoplankton at Unit 1 (N_1) or Unit 2 (N_{11}), N_1 = the density of ichthyoplankton in replicate 1, and N_2 = the density of ichthyoplankton in replicate 2.

The percentage of ichthyoplankton in the center channel entrained by Units 1 and 2 during day and night on each sample date was estimated from the formulas:

$$\% \text{ Entrained Unit 1} = (N_1 F_1 / \sum_{j=1}^J N_j F_j) 100$$

$$\% \text{ Entrained Unit 2} = (N_{11} F_{11} / \sum_{j=1}^J N_j F_j) 100$$

where N_1 = the mean ichthyoplankton density ($n/100 \text{ m}^3$) at Unit 1 taken in oblique tows during day (1000 and 1600 h) or night (2200 and 0400 h) collections, N_{11} = the mean ichthyoplankton density at Unit 2 taken in oblique tows during day or night collections, N_j = the mean ichthyoplankton density in zone j , F_1 = flow rate into the Unit 1 Intake ($100 \text{ m}^3/\text{min}$), F_{11} = flow rate into the Unit 2 Intake, and F_j = flow rate in zone j . All calculations of entrainment loss were made with oblique tows. Oblique tows were considered more representative of the mean ichthyoplankton density in the Intakes than surface tows, since entrainment of ichthyoplankton occurs at the river water pump inlets located near the bottom of the Unit 1 and 2 suction bays (Figures 4.1-1 and 4.1-2).

The total number of ichthyoplankton entrained by Units 1 and 2 during each 6 hour time interval (May through August) was estimated from the formula:

$$\# \text{ Entrained} = \left(\sum_{p=1}^P C_p N \right) 360$$

where C_p = the rated capacity of each river water pump (100 m³/min),
 N = the mean ichthyoplankton density (n/100 m³) taken in oblique tows during the time intervals, and 360 is the number of minutes in each interval.

An index of entrainment bias (EB), derived from Ivlev's electivity index (Ivlev 1961), was used to describe vulnerability of ichthyoplankton to entrainment at TMINS. The EB index was calculated from the formula:

$$EB = (u_i - p_i) / (u_i + p_i)$$

where u_i = the percentage for species i of total oblique density in either the Unit 1 or 2 suction bay and p_i = the corresponding value for species i in night samples at Station 13A2. Indices ranged from -1 to +1. A positive index indicated the species comprised a greater percentage of total density in the intake than at 13A2; a negative index indicated the species comprised a lesser percentage. If equal percentages were found at both locations, an index of zero resulted (no bias). Values of +1 or -1 occur when a species is taken only at one location.

Yearly EB indices (1977 through 1982) were calculated for the six most abundant species using mean density based on eight entrainment sample dates from May through August. Indices were not calculated for Unit 1 in 1976 because coincident sample dates for push net and entrainment collections were unavailable.

4.2 RESULTS

A total of 730 ichthyoplankters was taken at TMINS Units 1 and 2 in 1982 (Table 4.2-1). One hundred sixty collections at Unit 1 yielded 389 larvae (205 surface, 184 oblique) and 159 young (139 surface, 20 oblique). A total of 35 larvae (89 surface, 66 oblique) and 27 young (15 surface, 12 oblique) was taken at Unit 2 in 160 collections. Data for each sample date are presented in Tables 4.2-2 through 4.2-21 and summarized in Tables 4.2-22 through 4.2-30.

4.2.1 TMINS UNIT 1

Larvae were collected from 11-12 May through 24-25 August; young were taken on 15-16 June and 10-11 and 24-25 August (Table 4.2-22). Highest density ($371.61/100\text{ m}^3$) of total ichthyoplankton (surface and oblique tows combined) occurred on 10-11 August (Table 4.2-24). The five most abundant taxa at Unit 1 were the mimic shiner (22.7%), spottail shiner (19.8%), pumpkinseed/bluegill (15.2%), spotfin shiner (13.0%), and banded darter (10.9%) (Table 4.2-30).

Clupeids (herrings) were only collected on 20-21 July (Table 4.2-28). The gizzard shad was the only representative of this family (Table 4.2-24).

Cyprinids (carps and minnows) were collected on 11-12 and 25-26 May, and from 22-23 June through 24-25 August (Table 4.2-28). The spottail shiner, spotfin shiner, and mimic shiner were most common (Table 4.2-30). The spotfin shiner and mimic shiner were most abundant on 10-11 August; the spottail shiner was most abundant on 11-12 May (Table 4.2-24). Density of the common carp was lowest since entrainment studies at Unit 1 began; density of the mimic shiner was highest.

Catostomids (suckers) were taken from 11-12 May through 22-23 June (Table 4.2-28). The quillback was most common (Table 4.2-30); it was most abundant on 25-26 May (Table 4.2-24).

Ictalurids (bullhead catfishes) were represented by one specimen of the channel catfish taken on 10-11 August (Tables 4.2-18 and 4.2-24).

Centrarchids (sunfishes) were taken on 25-26 May, 15-16 June, and from 6-7 July through 24-25 August (Table 4.2-28). The pumpkinseed/bluegill was the most common centrarchid (Table 4.2-30); it was most abundant on 20-21 July (Table 4.2-24).

Percids (perches) were collected from 11-12 May through 15-16 June and on 6-7 and 20-21 July (Table 4.2-28). The banded darter and shield darter were most common (Table 4.2-30). The banded darter was most abundant on 25-26 May; the shield darter was abundant on 11-12 May (Table 4.2-24).

4.2.7 IMINS UNIT 2

Larvae were collected on 11-12 and 25-26 May and from 22-23 June through 24-25 August; young were taken on 15-16 June and 10-11 and 24-25 August (Table 4.2-23). Highest densities (171.50/100 m³) of total ichthyoplankton (surface and oblique tows combined) occurred on 11-12 May (Table 4.2-25). The five most abundant taxa at Unit 2 were the banded darter (28.5%), spottail shiner (27.7%), spotfin shiner (24.2%), quillback (5.4%), and pumpkinseed/bluegill (5.1%) (Table 4.2-30).

Cyprinids were collected from 11-12 May through 24-25 August (Table 4.2-29). The spottail shiner and spotfin shiner were most common (Table 4.2-30); they were most abundant on 11-12 May and 24-25 August, respectively (Table 4.2-25). Density of common carp was the lowest since entrainment studies at Unit 2 began.

Catostomids were taken on 11-12 May and 25-26 May and 22-23 June (Table 4.2-29). The pumpkinseed was taken most frequently (Table 4.2-30); it was most abundant on 25-26 May (Table 4.2-25).

Centrarchids were taken on 20-21 July and 10-11 August (Table 4.2-29). The pumpkinseed/bluegill was most common (Table 4.2-30); it was most abundant on 20-21 July (Table 4.2-25).

Percids were collected from 11-12 May through 15-16 June and on 6-7 and 20-21 July (Table 4.2-29). The banded darter was most common (Table 4.2-30); it was most abundant on 25-26 May (Table 4.2-25).

4.2.3 DATA ANALYSIS

Results of the ANOVA and SNK tests are presented in Tables 4.2-31 through 4.2-37.

Total ichthyoplankton densities ($n/3 \text{ m}^3$) for Unit 1 were compared by year (1977 through 1982), date (May through August), depth (surface and oblique), and time interval (1000, 1600, 2200, 0400 h) (Table 4.2-31). Significant differences ($P \leq 0.05$) were noted for all factors. Results of the SNK revealed that the second July sample period was significantly greater than all other periods and the second August sample period was significantly lower than all other periods (Table 4.2-35). Mean densities were significantly higher during the 1000 and 0400 h time intervals. The SNK also indicated that 1982 mean density was significantly lower than the 1981 mean density but similar to all other years.

Total ichthyoplankton densities for Unit 2 were compared by year (1978 through 1982), date, depth, and time interval (Table 4.2-32).

Significant differences ($P \leq 0.05$) were noted for all factors.

Results of the SNK showed the first June sample period was significantly higher than the second May period and both were significantly higher than all others (Table 4.2-36). Densities during the 1000 h time interval were significantly greater than the 1600 h interval. Densities in 1982 and 1979 were similar to one another but significantly lower than all other years.

Comparisons of total ichthyoplankton density at Unit 1 for 1982 revealed significant differences ($P \leq 0.05$) for all factors except replicates (Table 4.2-33). Results of the SNK showed densities on 10-11 August were significantly greater than all other dates; densities on 11-12 May were significantly greater than all dates except 10-11 August (Table 4.2-37). Densities on 25-26 May and 20-21 July were similar but significantly greater than all dates except 11-12 May and 10-11 August. Density at 0400 h was significantly greater than all others; the 2200 h density was significantly greater than the 1000 and 1600 h densities.

No significant difference in density was noted for replicates in 1982 at Unit 2; all other factors showed significant differences (Table 4.2-33). The 11-12 May density was significantly greater than all other dates, and 25-26 May was significantly greater than all dates except 11-12 May (Table 4.2-37). Densities on 20-21 July and 10-11 and 24-25 August were similar and significantly greater than all other dates except 11-12 and 25-26 May. The 0400 h density was significantly greater than all others; density at 1000 h was significantly lower than the other intervals.

A comparison of Units 1 and 2 for 1982 revealed significant differences for all factors except replicates (Table 4.2-34). Total density at Unit 1 has been significantly greater than Unit 2 every year both units were sampled, except in 1980. Total density at Unit 2 in 1980 was 82.8% of the Unit 1 density; Unit 2 density in 1982 was 47.7% of Unit 1 density. The densities on 10-11 August and 11-12 May were significantly greater than all other dates but were not significantly different from each other (Table 4.2-37). The 0400 h time interval density was significantly greater than all others; the 2200 h density was significantly greater than 1000 and 1600 h densities.

4.2.4 PERCENT COMPOSITION AND PERCENT SIMILARITY

Percent composition of fishes for time interval and type of tow is presented in Tables 4.2-38 and 4.2-39. Percent similarity indices are presented in Table 4.2-40.

Percent similarity values between surface and oblique tows for each time interval ranged from 38.0% (1000 h) to 71.6% (1600 h) at Unit 1 and from 53.3% (0400 h) to 66.6% (1000 h) at Unit 2 (Table 4.2-40). Values between time intervals for surface tows at Unit 1 ranged from 38.2% (1000 vs. 2200 h) to 76.8% (1600 vs. 0400 h) and at Unit 2 from 37.6% (2200 vs. 0400 h) to 78.7% (1000 vs. 1600 h). Values between time intervals for oblique tows at Unit 1 ranged from 50.4% (1000 vs. 2200 h) to 71.6% (2200 vs. 0400 h) and at Unit 2 from 41.9% (2200 vs. 0400 h) to 69.1% (1000 vs. 0400 h).

Numbers and percent composition of ichthyoplankton taken across Transect TM-LF-13A3 and at the TMINS Intakes are presented in Table 4.2-41. Percent similarity indices derived from Table 4.2-41 are presented in Table 4.2-42. Values of percent similarity of species composition between TMINS Unit 1 or Unit 2 Intakes and any of the three push net stations in Transect TM-LF-13A3 were highest when compared with Station 13A2 (55.1% for Unit 1 and 58.0% for Unit 2).

4.2.5 ENTRAINMENT ESTIMATES

Estimates of the numbers of ichthyoplankton entrained at TMINS Units 1 and 2 in 1982 during each 24-hour sample period are presented in Table 4.2-43. Estimates at Unit 1 ranged from 7,979 on 15-16 June to 211,418 on 25-26 May (Table 4.2-43). The estimated number of ichthyoplankton entrained at Unit 1, May through August, was 11,057,841 (Table 4.2-44).

The estimated number of ichthyoplankton entrained at Unit 2 in 1982 ranged from 14,561 on 15-16 June to 205,621 on 25-26 May (Table 4.2-43). The estimated total number of ichthyoplankton entrained at Unit 2, May through August, was 10,081,753 (Table 4.2-44).

The day-night distribution of ichthyoplankton across the center channel at Transect TM-LF-13A3 is illustrated in Figure 4.2-1. The results of ichthyoplankton samples taken at midchannel Station TM-LF-13A4 are presented in Tables 4.2-45 and 4.2-46. Ichthyoplankton densities during the day were generally lower than night densities in all zones. Day and night densities were generally higher near TMINS (Zone I: Station 13A2) than in the other zones (Table 4.2-41 and Figure

4.2-1). Fishes most abundant near TMINS (Station 13A2) were common carp, quillback, spottail shiner, spotfin shiner, pumpkinseed/bluegill, and banded darter (see Table 3.2-49, Section 3.0).

Estimates of the percentage of total ichthyoplankton drifting through the center channel at Transect TM-LF-13A3 which were entrained during the day ranged from 0.13% (15 June) to 28.42% (11 May) at Unit 1 and from 0.36% (15 June) to 17.70% (11 May) at Unit 2 (Table 4.2-47). Values for ichthyoplankton entrained at night ranged from 0.04% (15-16 June) to 29.05% (24-25 August) at Unit 1 and from 0.45% (22-23 June) to 33.81% (24-25 August) at Unit 2 (Table 4.2-48).

Ichthyoplankton densities in the center channel were notably higher at night than during the day. Edwards et al. (1977), Gale and Mohr (1978), Lewis and Siler (1980), and Van Den Avyle and Fox (1980) reported that surface ichthyoplankton densities were generally higher at night. From 1976 through 1981, 80 to 89% of the total push net catch was taken at night in York Haven Pond (Nardacci and Associates 1982). The diel variation of ichthyoplankton taken in the TMINS Intakes was less evident (Tables 4.2-38 and 4.2-39). Thus, the relatively constant (day and night) Intake densities when compared with the oscillating (low day, high night) densities encountered at the push net stations generally resulted in relatively high daytime entrainment estimates. These high values probably did not reflect the true entrainment rate, but rather resulted from the lack of sensitivity of the entrainment estimates at low ichthyoplankton densities.

An estimate of the percentage of individual taxa entrained by Units 1 and 2 is presented in Tables 4.2-49 through 4.2-56. The estimate of entrainment for an individual taxon is dependent upon its distribution and relative abundance across Transect TM-LF-13A3. Based on river flow in the center channel (combined total of F_I through F_{IV}) and the combined Unit 1 and 2 (F_i and F_{ii}) flow rates (Tables 4.2-47 and 4.2-48), and assuming an even distribution of ichthyoplankton in both, the entrainment rates for Units 1 and 2 can be expected to range from 0.31 to 4.01% of the total ichthyoplankton in the center channel. Estimates for fishes taken in low numbers in river collections or in both river and entrainment collections were difficult to interpret. Where this occurred the magnitude of the entrainment loss was disregarded; however, the fact that entrainment loss occurred was noted.

4.3 DISCUSSION

Mean ichthyoplankton densities at Units 1 and 2 in 1982 were in the low range of those observed previously (Figure 4.3-1). Mean density at Unit 1 was the lowest since entrainment studies began in 1976 (Table 4.2-30). Densities were also low in the push net program in 1982 (See Table 3.3-1, Section 3.0). The low densities of ichthyoplankton may have resulted from heavy rains in late May and early June, which produced unseasonably high river flow and reduced water temperature at a time when ichthyoplankton densities have historically been high (Figure 4.3-1). Gallagher and Conner (1980) found a negative correlation between the relative abundance of total ichthyoplankton and river stage.

Lathrop (1982) reported that river flow greater than 1,133 m³/s decreased densities near TMINS; river flow at Harrisburg, Pennsylvania was above this volume from 30 May through 21 June in 1982. The decrease in water temperature could have delayed spawning for many species. Peak density of ichthyoplankton near TMINS usually occurs just after water temperature reaches 20 C (Lathrop 1982); this was not reached until 16 June (Table 4.2-10).

Density trends through 1982 at both Units have shown a bimodal distribution (Figure 4.3-1) which has usually occurred concurrently in both the entrainment and push net programs. The early peak is typically composed of the common carp, spottail shiner, quillback, and percids. Principal components of the later peak are spotfin shiner and centrarchids. This seasonal succession of taxa has been noted in many studies and is primarily due to the different spawning times of fishes (Hatch 1980, Johnson and Edwards 1977). A large later peak was observed at Unit 1 in 1982 (Figure 4.3-1) and coincided with the highest densities of mimic shiner taken on 10-11 August (Table 4.2-24). No later peak in ichthyoplankton abundance occurred at Unit 2 in 1982.

Peak densities at Units 1 and 2 have usually occurred in different months (Nardacci and Associates 1982). Although this trend was noted in 1982, it was not as pronounced. The continuing difference in species composition between the Units may explain this difference. Percent similarity of species composition between the Units in 1982 was 58.6% (Table 4.2-42). Previously, the major differences had been the greater

proportion of banded darter and shield darter at Unit 2 in May, and the proportionally higher catch of spotfin shiner and pumpkinseed/bluegill at Unit 1 in July (Nardacci and Associates 1982). This was generally valid in 1982 but the large catches of mimic shiner in July and August accentuated the later peak at Unit 1 (Table 4.2-30 and Figure 4.3-2). In addition to differences in species composition between the Units, a difference was noted between the Units and the nearest push net station (Station 13A2). Based on coincident samples taken in combined day and night push net and entrainment samples, Station 13A2 was 55.1% and 58.0% similar to Units 1 and 2, respectively (Table 4.2-42).

Differences in species composition between push net and entrainment samples result from the unequal spatial distribution of species. To quantify these tendencies, an entrainment bias (EB) index was used. The index was originally developed for use in food habits studies (Ivlev 1961). The equation is useful when one community is assumed to supply a second community with organisms.

Data used in computation of yearly EB indices were obtained from Tables 3.2-49 (Section 3.0), 4.2-38, and 4.2-39 and from equivalent data in previous reports (Nardacci and Associates 1978, 1979, 1980, 1981, and 1982). The EB indices for the six most abundant taxa (1977 through 1982) are presented in Table 4.3-1 and Figure 4.3-3.

A positive EB index has consistently occurred for the spotfin shiner, pumpkinseed/bluegill, banded darter, and shield darter; the quillback had a negative index. Consistent differences in EB indices

between the Units were apparent for the pumpkinseed/bluegill (more vulnerable to entrainment at Unit 1 than at Unit 2), and quillback (more vulnerable to entrainment at Unit 2 than at Unit 1). The EB indices illustrated the variability of species vulnerable to entrainment at TMINS.

Estimates of the percent of total ichthyoplankton entrained at Transect TM-LF-13A3 from the center channel and Zone I are presented in Tables 4.2-47 and 4.2-48. Examining Zone I provided a more localized perspective of entrainment impact at TMINS. Intake flow rates for the 10 sample dates ranged from 1.4 to 17.5% of the flow in Zone I. Thus, it appears that entrainment of ichthyoplankton was limited to Zone I. Percentage of ichthyoplankton entrained from Zone I will be higher than if all four zones were combined. Flow in Zone I is about 9.6% of river flow; center channel flow is about 42.0% of river flow (Brown and McQuivey 1981).

Hatch (1980) concluded that entrainment appeared to be associated with the seasonal succession and behavioral characteristics of larvae and physical factors such as river discharge, wave action, and intake volume and velocity. Most of these factors similarly influenced entrainment at TMINS. Dominant among behavioral characteristics was diel distribution. Eddy currents created by the wingwalls in front of the Intakes may act to concentrate ichthyoplankton. Wind action particularly from the west may concentrate ichthyoplankton along the west shore of TMI.

Factors affecting entrainment may be divided into two groups. The first group may cause intake and push net densities to vary together. That is, a factor such as seasonal succession, river flow, or wind action may cause densities at the push net stations to increase or decrease in the same manner that intake densities react. A factor of the second group may cause densities in one area (push net or intake) to increase or decrease while densities in the other area remain relatively unaffected. The second group may include diel distribution, eddy currents at the Intakes, and intake velocity. The second group may result in high estimates of percent entrainment, when for example low river densities during the day are compared with intake densities which are relatively unaffected by diel variation.

Flow rates into TMINS on entrainment sample dates ranged from 0.08% (15-16 June) to 1.93% (24-25 August) of the total river flow at Harrisburg, Pennsylvania.

The low intake volume coupled with localized entrainment indicated a minimal effect on fish populations near TMINS.

Table 4.1-1

List of scientific and common names of ichthyoplankton collected by 0.5 m net during entrainment studies in the TMINS Unit 1 and Unit 2 Intake suction bays in 1982.

Scientific Name	Common Name
Clupeidae	Herrings
<u>Dorosoma cepedianum</u> (Lesueur)	Gizzard shad
Cyprinidae	Carps and Minnows
<u>Cyprinus carpio</u> Linnaeus	Common carp
<u>Notropis amoenus</u> (Abbott)	Comely shiner
<u>Notropis cornutus</u> (Mitchill)	Common shiner
<u>Notropis hudsonius</u> (Clinton)	Spottail shiner
<u>Notropis spilopterus</u> (Cope)	Spotfin shiner
<u>Notropis volucellus</u> (Cope)	Mimic shiner
Catostomidae	Suckers
<u>Carpiodes cyprinus</u> (Lesueur)	Quillback
<u>Catostomus commersoni</u> (Lacepède)	White sucker
Ictaluridae	Bullhead catfishes
<u>Ictalurus punctatus</u> (Rafinesque)	Channel catfish
Centrarchidae	Sunfishes
<u>Ambloplites rupestris</u> (Rafinesque)	Rock bass
<u>Lepomis gibbosus</u> (Linnaeus)	Pumpkinseed
<u>Lepomis macrochirus</u> Rafinesque	Bluegill
<u>Micropterus dolomieu</u> Lacepède	Smallmouth bass
Percidae	Perches
<u>Etheostoma olmstedi</u> Storer	Tessellated darter
<u>Etheostoma zonale</u> (Cope)	Banded darter
<u>Percina peltata</u> (Stauffer)	Shield darter

Table 4.1-2

Location of Zones I through IV of Transect TM-LF-13A3 in the center channel of York Haven Pond off the TMINS Unit 1 Intake.

Transect	Location	Zone No.	Location
TM-LF-13A3	A line running due east-west at 40° 09' 20" N passing through the first marble marker north of the TMINS Unit 1 Intake (Gilbert Associates, Inc. 1979).	I	West shore of TMI to a point 86.5 m offshore.*
		II	From a point 86.5 m off the west shore of TMI to a point 173.0 m offshore (midchannel).
		III	From a point 173.0 m offshore to a point 86.5 m off the east shore of Shelley Island.
		IV	East shore of Shelley Island to a point 86.5 m offshore.

* All zones form a plane from the surface of the water to the river bed.

Table 4.1-3

Location and description of the ichthyoplankton entrainment station near the TMINS Unit 1 Intake sampled in 1982.

Station Number	Location and Description
TM-LF-13A4	40° 09' 16" N, 76° 43' 47" W. Midchannel beginning from a point upstream of the TMINS Unit 2 Intake to a point upstream of the TMINS Unit 1 Intake.

Table 4.2-1

Number of ichthyoplankton taken in surface (S) and oblique (O) tows during entrainment studies at TMINS Units 1 and 2, 13-14 April through 24-25 August 1982.

		Apr 13-14	Apr 27-28	May 11-12	May 25-26	Jun 15-16	Jun 22-23	Jul 6-7	Jul 20-21	Aug 10-11	Aug 24-25	TOTAL
UNIT 1												
Larvae	S	NO	64	30	4	3	3	67	33	1		205
	O		72	47	1	6	5	38	14	1		184
Young	S	FISH	-	-	-	-	-	-	129	10		139
	O		-	-	2	-	-	-	15	3		20
Total	S	TAKEN	64	30	4	3	3	67	162	11		344
	O		72	47	3	6	5	38	29	4		204
UNIT 2												
Larvae	S	NO	36	25	-	2	4	11	9	2		89
	O		22	22	-	4	2	11	4	1		66
Young	S	FISH	-	-	-	-	-	-	4	11		15
	O		-	-	2	-	-	-	4	6		12
Total	S	TAKEN	36	25	-	2	4	11	13	13		104
	O		22	22	2	4	2	11	8	7		78
GRAND TOTAL			194	124	9	15	14	127	212	35		730

TABLE 4.2-2

NUMBER (N) AND DENSITY (#/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 1 INTAKE SUCTION BAY ON 13-14 APRIL 1982.

TIME PERIOD	1000		1600	
	SURFACE 1027	OBLIQUE 1045	SURFACE 1724	OBLIQUE 1717
STATION				
TIME	1:02		1:02	
RIVER STAGE (M)	7.0		8.1	
WATER TEMPERATURE (C)	11.4		11.1	
DISSOLVED OXYGEN (#MG/L)	8.1		8.0	
PH				
NUMBER OF RIVER WATER PUMPS:				
NUCLEAR SERVICE	1		1	
SECONDARY SERVICE	0		0	
DECAY /EA:				
REPLICATE				
VOLUME SAMPLED (M ³)	A	B	A	B
DENSITY	3.3	3.0	3.3	3.1
MEAN DENSITY	0.00	0.00	0.00	0.00
	N DENSITY	N DENSITY	N DENSITY	N DENSITY
	0.00	0.00	0.00	0.00
LARVAE	NO LARVAE TAKEN		NO LARVAE TAKEN	
YOUNG	NO YOUNG TAKEN		NO YOUNG TAKEN	

TABLE 4.2-2 CONTINUED.

TIME PERIOD	2200		0400	
	SURFACE 2215	OBLIQUE 2208	SURFACE 0433	OBLIQUE 0424
STATION				
TIME	1:03		1:07	
RIVER STAGE (M)	8.0		17.5	
WATER TEMPERATURE (C)	11.2		11.8	
DISSOLVED OXYGEN (#MG/L)	17.9		17.8	
PH				
NUMBER OF RIVER WATER PUMPS:				
NUCLEAR SERVICE	1		1	
SECONDARY SERVICE	0		0	
DECAY /EA:				
REPLICATE				
VOLUME SAMPLED (M ³)	A	B	A	B
DENSITY	3.2	3.2	3.2	3.1
MEAN DENSITY	0.00	0.00	0.00	0.00
	N DENSITY	N DENSITY	N DENSITY	N DENSITY
	0.00	0.00	0.00	0.00
LARVAE	NO LARVAE TAKEN		NO LARVAE TAKEN	
YOUNG	NO YOUNG TAKEN		NO YOUNG TAKEN	

TABLE 4-2-3

RUPPER (N) AND DENSITY (M/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 2 INTAKE SUCTION BAY ON 13-14 APRIL 1992.

TIME PERIOD	1000			1600		
	SURFACE 1144	OBLIQUE 1153	OBLIQUE 1635	SURFACE 1645		OBLIQUE 1655
STATION						
TIME						
RIVER STAGE (M)	1.92			1.97		
WATER TEMPERATURE (C)	17.0			18.0		
DISSOLVED OXYGEN (MG/L)	11.6			11.2		
PH	8.1			8.1		
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE						
REPLICATE						
VOLUME SAMPLED (M ³)						
DENSITY	A	B	A	B	A	B
2.1	2.2	2.3	2.1	2.3	2.4	2.2
0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
	0.00	0.00	0.00	0.00	0.00	0.00
LARVAE			NO LARVAE TAKEN			
YOUNG			NO YOUNG TAKEN			

TABLE 4-2-3 CONTINUED.

TIME PERIOD	2200			0400		
	SURFACE 2231	OBLIQUE 2237	OBLIQUE 0507	SURFACE 0459		OBLIQUE 0507
STATION						
TIME						
RIVER STAGE (M)	1.93			1.93		
WATER TEMPERATURE (C)	18.0			18.0		
DISSOLVED OXYGEN (MG/L)	11.2			11.4		
PH	7.6			7.2		
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE						
REPLICATE						
VOLUME SAMPLED (M ³)						
DENSITY	A	B	A	B	A	B
2.2	2.2	2.2	2.0	2.2	2.4	2.1
0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
	0.00	0.00	0.00	0.00	0.00	0.00
LARVAE			NO LARVAE TAKEN			
YOUNG			NO YOUNG TAKEN			

TABLE 4-2-4

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 1 INTAKE SUCTION BAY ON 27-28 APRIL 1982.

TIME PERIOD	1000			1600		
	SURFACE 0958	OBLIQUE 1005	OBLIQUE 1559	SURFACE 1553		OBLIQUE 1559
STATION				153		
RIVER STAGE (M)	15.0			15.0		
WATER TEMPERATURE (C)	9.3			9.2		
DISSOLVED OXYGEN (MG/L)	7.2			7.2		
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE	1			1		
DECAY HEAT						
REPLICATE						
VOLUME SAMPLED (M ³)	A 3.1	B 3.2	B 3.3	A 2.9	B 2.9	B 3.1
DENSITY	0.00	0.00	0.00	0.00	0.00	0.00
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE	NO LARVAE TAKEN					
YOUNG	NO YOUNG TAKEN					

TABLE 4-2-8 CONTINUED.

TIME PERIOD	2200			0400		
	SURFACE 2225	OBLIQUE 2219	OBLIQUE 0420	SURFACE 0420		OBLIQUE 0427
STATION				154		
RIVER STAGE (M)	14.5			14.0		
WATER TEMPERATURE (C)	9.3			9.2		
DISSOLVED OXYGEN (MG/L)	7.3			7.2		
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE	1			1		
DECAY HEAT						
REPLICATE						
VOLUME SAMPLED (M ³)	A 2.9	B 3.0	B 3.2	A 3.0	B 3.0	B 3.9
DENSITY	0.00	0.00	0.00	0.00	0.00	0.00
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE	NO LARVAE TAKEN					
YOUNG	NO YOUNG TAKEN					

TABLE 4-2-5

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY D-5 M NET IN THE UNIT 2 INTAKE SUCTION BAY ON 27-28 APRIL 1982.

TIME PERIOD	1000		1600	
	SURFACE 1049	OBLIQUE 1040	SURFACE 1615	OBLIQUE 1622
STATION				
TIME	1:53		1:53	
RIVER STAGE (M)	14.0		14.5	
WATER TEMPERATURE (C)	9.3		9.8	
DISSOLVED OXYGEN (MG/L)	7.4		7.2	
PH				
NUMBER OF RIVER WATER PUMPS:	1		1	
NUCLEAR SERVICE				
SECONDARY SERVICE				
REPLICATE				
VOLUME SAMPLED (M ³)				
DENSITY	A 2.1 0.00	B 2.2 0.00	A 2.1 0.00	B 2.2 0.00
MEAN DENSITY	N DENSITY 0.00	N DENSITY 0.00	N DENSITY 0.00	N DENSITY 0.00
LARVAE	NO LARVAE TAKEN			
YOUNG	NO YOUNG TAKEN			

TABLE 4-2-5 CONTINUED.

TIME PERIOD	2200		0400	
	SURFACE 2243	OBLIQUE 2251	SURFACE 0453	OBLIQUE 0501
STATION				
TIME	1:54		1:54	
RIVER STAGE (M)	14.5		14.0	
WATER TEMPERATURE (C)	9.5		9.6	
DISSOLVED OXYGEN (MG/L)	7.3		7.2	
PH				
NUMBER OF RIVER WATER PUMPS:	1		1	
NUCLEAR SERVICE				
SECONDARY SERVICE				
REPLICATE				
VOLUME SAMPLED (M ³)				
DENSITY	A 2.1 0.00	B 2.1 0.00	A 2.0 0.00	B 2.1 0.00
MEAN DENSITY	N DENSITY 0.00	N DENSITY 0.00	N DENSITY 0.00	N DENSITY 0.00
LARVAE	NO LARVAE TAKEN			
YOUNG	NO YOUNG TAKEN			

TABLE A-2-6

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 1 INTAKE SUCTION BAY ON 11-12 MAY 1982.

TIME PERIOD	1000			1600		
	SURFACE 1030	OBLIQUE 1022	OBLIQUE 1620	SURFACE 1613	OBLIQUE 1620	OBLIQUE 1620
STATION						
TIME	1:27			1:30		
RIVER STAGE (M)	17.0			16.5		
WATER TEMPERATURE (C)	9.2			9.2		
DISSOLVED OXYGEN (MG/L)	7.9			7.6		
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE	0			0		
DECAY HEAT						
REPLICATE						
VOLUME SAMPLED (M ³)	A 3.0	B 2.9	R 3.1	A 3.3	B 3.2	A 3.7
DENSITY	97.97	169.94	260.05	109.66	188.86	215.33
MEAN DENSITY			210.61			292.89
	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE	2	1	3	0	3	9
NOTROPIS HUDSONIUS	0	0	0	0	0	0
CARPIODUS CYPRINUS	0	0	0	0	0	0
CAROTOMUS COMMERSONI	1	0	0	1	0	0
ETHIOSTOMA OLIVACEI	0	0	0	0	0	0
ETHIOSTOMA ZONALE	0	0	0	0	0	0
PELICINA PELTATA	0	4	0	0	1	2
TOTAL LARVAE	3	5	3	1	1	2
NO YOUNG TAKEN	7	5	5	6	6	14
YOUNG						
TOTAL	3	5	7	7	7	14

TABLE A-2-6 CONTINUED.

TIME PERIOD	2200			0400		
	SURFACE 2215	OBLIQUE 2223	OBLIQUE 0508	SURFACE 0500	OBLIQUE 0508	OBLIQUE 0508
STATION						
TIME	1:31			1:31		
RIVER STAGE (M)	19.0			19.0		
WATER TEMPERATURE (C)	8.2			8.9		
DISSOLVED OXYGEN (MG/L)						
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE	0			0		
DECAY HEAT						
REPLICATE						
VOLUME SAMPLED (M ³)	A 3.0	B 3.2	R 3.2	A 2.7	B 3.2	A 3.2
DENSITY	66.18	250.57	196.01	862.78	493.67	678.01
MEAN DENSITY			160.33			479.37
	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE	2	8	5	19	6	11
NOTROPIS HUDSONIUS	0	0	0	0	0	0
CARPIODUS CYPRINUS	0	0	0	0	0	0
CAROTOMUS COMMERSONI	0	0	0	0	0	0
ETHIOSTOMA OLIVACEI	0	0	0	0	0	0
ETHIOSTOMA ZONALE	0	0	1	1	0	2
PELICINA PELTATA	0	0	0	0	0	0
TOTAL LARVAE	2	8	5	19	6	11
NO YOUNG TAKEN	7	8	7	25	14	18
YOUNG						
TOTAL	2	8	7	25	14	18

TABLE #2-7

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE U-11 2 INTAKE SUCTION BAY ON 11-12 MAY 1982.

TIME PERIOD	1000			1600		
	SURFACE 1105	OBLIQUE 1112	OBLIQUE 1645	SURFACE 1638	OBLIQUE 1645	OBLIQUE 1645
STATION						
TIME	1:27			1:30		
RIVER STAGE (M)	17.0			18.0		
WATER TEMPERATURE (C)	9.3			9.8		
DISSOLVED OXYGEN (MG/L)	7.9			7.7		
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE						
REPLICATE						
VOLUME SAMPLED (M ³)	2-1	2-1	2-1	2-1	2-1	2-2
DENSITY	143.93	97.50	119.23	235.78	246.58	46.15
MEAN DENSITY						
LARVAE						
METROBIS HUDSONIUS	2	0	0	4	5	1
CARPIODUS CYPRIINUS	0	0	0	0	0	0
CATOSTOMUS COMMERSONI	0	0	0	0	0	0
ETHEOSTOMA OLIMBEDI	0	0	0	0	0	0
ETHEOSTOMA ZONALE	0	47.50	0	0	0	0
PERCINA PELTATA	0	0	0	0	0	0
TOTAL LARVAE	2	47.50	0	4	5	1
NO YOUNG TAKEN						
YOUNG	1	1	4	5	5	1
TOTAL	3	1	4	5	5	1

TABLE #2-7 CONTINUED.

TIME PERIOD	2200			0600		
	SURFACE 2250	OBLIQUE 2243	OBLIQUE 0635	SURFACE 0628	OBLIQUE 0635	OBLIQUE 0635
STATION						
TIME	1:31			1:31		
RIVER STAGE (M)	19.0			19.0		
WATER TEMPERATURE (C)	8.2			7.7		
DISSOLVED OXYGEN (MG/L)						
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE						
REPLICATE						
VOLUME SAMPLED (M ³)	2-1	2-1	2-1	2-1	2-1	2-2
DENSITY	340.88	217.14	286.62	329.31	294.16	46.26
MEAN DENSITY						
LARVAE						
METROBIS HUDSONIUS	6	4	7	1	2	2
CARPIODUS CYPRIINUS	1	0	0	0	0	0
CATOSTOMUS COMMERSONI	0	0	0	0	0	0
ETHEOSTOMA OLIMBEDI	0	0	0	0	0	0
ETHEOSTOMA ZONALE	0	45.60	0	4	0	0
PERCINA PELTATA	0	0	0	0	0	0
TOTAL LARVAE	7	49.60	7	5	2	2
NO YOUNG TAKEN						
YOUNG	2	2	7	6	6	2
TOTAL	9	2	7	11	12	4

TABLE 4-2-8

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 1 INTAKE SUCTION BAY ON 25-26 MAY 1982.

TIME PERIOD	1000			1600		
	SURFACE 1021	OBLIQUE 1012	OBLIQUE 1600	SURFACE 1600	OBLIQUE 1600	
STATION						
TIME	1:30			1:35		
RIVER STAGE (M)	16.0			17.0		
WATER TEMPERATURE (C)	8.1			8.6		
DISSOLVED OXYGEN (MG/L)	8.2			7.7		
PH						
NUMBER OF RIVER WATER PUMPS:	1			1		
NUCLEAR SERVICE	0			0		
SECONDARY SERVICE						
DECAY HEAT						
REPLICATE	A	B	A	B	A	B
VOLUME SAMPLED (M ³)	3.1	3.2	3.1	3.1	3.2	3.4
DENSITY	65.88	0.00	192.75	189.71	186.67	58.63
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE	0	0	0	0	0	0
CYPRINUS CARPIO	0	0	0	0	0	0
NOTROPIS AMUSONIUS	0	0	0	0	0	0
NOTROPIS MUDSONIUS	0	0	0	0	0	0
CYPRINUS CYPRINUS	0	0	0	0	0	0
CYPRINUS COMMERSONI	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L-MACROCHIRUS	0	0	0	0	0	0
ETHIOSTOMA OLIVASTEDI	0	0	0	0	0	0
ETHIOSTOMA ZONALE	2	0	0	0	0	0
ETHIOSTOMA PELTATA	2	0	0	0	0	0
TOTAL LARVAE	2	0	0	0	0	0
NO YOUNG TAKEN						
YOUNG	2	0	0	2	1	2
TOTAL	2	0	0	2	1	2

TABLE 4-2-8 CONTINUED.

TIME PERIOD	2200			0800		
	SURFACE 2236	OBLIQUE 2243	OBLIQUE 0850	SURFACE 0840	OBLIQUE 0850	
STATION						
TIME	1:59			1:43		
RIVER STAGE (M)	18.5			18.9		
WATER TEMPERATURE (C)	8.0			8.1		
DISSOLVED OXYGEN (MG/L)						
PH						
NUMBER OF RIVER WATER PUMPS:	1			1		
NUCLEAR SERVICE	1			2		
SECONDARY SERVICE						
DECAY HEAT						
REPLICATE	A	B	A	B	A	B
VOLUME SAMPLED (M ³)	3.4	3.3	3.7	3.7	3.7	3.1
DENSITY	88.63	151.54	181.55	158.75	157.95	32.41
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE	0	0	0	0	0	0
CYPRINUS CARPIO	0	0	0	0	0	0
NOTROPIS AMUSONIUS	0	0	0	0	0	0
NOTROPIS MUDSONIUS	0	0	0	0	0	0
CYPRINUS CYPRINUS	0	0	0	0	0	0
CYPRINUS COMMERSONI	0	0	0	0	0	0
LEPOMIS GIBBOSUS/L-MACROCHIRUS	0	0	0	0	0	0
ETHIOSTOMA OLIVASTEDI	0	0	0	0	0	0
ETHIOSTOMA ZONALE	0	0	0	0	0	0
ETHIOSTOMA PELTATA	0	0	0	0	0	0
TOTAL LARVAE	0	0	0	0	0	0
NO YOUNG TAKEN						
YOUNG	3	5	6	10	11	10
TOTAL	3	5	6	10	11	10

TABLE #2-9

NUMBER (N) AND DENSITY (N/VOLUME M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 2 INTAKE SUCTION BAY ON 25-26 MAY 1982.

TIME PERIOD	1000			1600		
	SURFACE 1050	OBLIQUE 1057	OBLIQUE 1627	SURFACE 1636	OBLIQUE 1635	OBLIQUE 1627
STATION						
TIME	16:30			17:30		
RIVER STAGE (M)	16.0			17.0		
WATER TEMPERATURE (C)	8.3			8.0		
DISSOLVED OXYGEN (MG/L)	8.1			7.9		
PH						
NUMBER OF RIVER WATER PUMPS:	1			1		
NUCLEAR SERVICE						
SECONDARY SERVICE						
REPLICATE	A	B		A	B	
VOLUME SAMPLED (M ³)	2.2	2.3		2.2	2.3	
DENSITY	0.00	0.00		98.56	98.50	
MEAN DENSITY	N DENSITY	N DENSITY		N DENSITY	N DENSITY	
	0.00	0.00		81.03	81.03	
LARVAE						
NOTROPIS AMOENUS	0	0		0	1	
NOTROPIS HUDSONIUS	0	0		0	0	
CYPRINUS CYPRIUS	0	0		0	0	
CYPRINUS COMPERSONI	0	0		0	0	
CYPRINUS ZONALE	0	0		0	0	
PERCINNA PELTATA	0	0		0	0	
TOTAL LARVAE	0	0		0	1	
YOUNG						
TOTAL	0	0		0	1	

TABLE #2-9 CONTINUED.

TIME PERIOD	2200			0000		
	SURFACE 2216	OBLIQUE 2209	OBLIQUE 0016	SURFACE 0007	OBLIQUE 0016	OBLIQUE 0016
STATION						
TIME	17:39			18:43		
RIVER STAGE (M)	17.5			18.0		
WATER TEMPERATURE (C)	8.1			8.9		
DISSOLVED OXYGEN (MG/L)	8.1			8.0		
PH						
NUMBER OF RIVER WATER PUMPS:	1			1		
NUCLEAR SERVICE						
SECONDARY SERVICE						
REPLICATE	A	B		A	B	
VOLUME SAMPLED (M ³)	42.59	21.35		436.53	490.03	
DENSITY	2.3	2.3		2.3	2.3	
MEAN DENSITY	N DENSITY	N DENSITY		N DENSITY	N DENSITY	
	42.59	21.35		490.03	339.85	
LARVAE						
NOTROPIS AMOENUS	0	0		0	0	
NOTROPIS HUDSONIUS	0	0		0	0	
CYPRINUS CYPRIUS	1	0		0	0	
CYPRINUS COMPERSONI	0	0		0	0	
CYPRINUS ZONALE	0	0		0	0	
PERCINNA PELTATA	0	0		0	0	
TOTAL LARVAE	1	0		0	0	
YOUNG						
TOTAL	1	0		0	0	

TABLE 4-2-10

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 1 INTAKE SUCTION BAY ON 15-16 JUNE 1982.

TIME PERIOD	1000			1800		
	SURFACE 1014	OBLIQUE 1021	OBLIQUE 1055	SURFACE 1603	OBLIQUE 1610	OBLIQUE 1655
STATION						
TIME	2:04			2:03		
RIVER STAGE (M)	18.0			18.0		
WATER TEMPERATURE (C)	17.9			18.0		
DISSOLVED OXYGEN (MG/L)				8.9		
PH	7.9			8.0		
NUMBER OF RIVER WATER PUMPS:	1			1		
NUCLEAR SERVICE	0			0		
SECONDARY SERVICE						
DECAY HEAT						
REPLICATE	A	B		A	B	
VOLUME SAMPLED (M ³)	3.3	3.4		3.3	3.3	
DENSITY	0.00	29.54		0.00	28.30	
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
	14.77	14.15	14.39	0.00	0.00	14.39
LARVAE	0	0	0	0	0	0
CYPRINUS	0	0	0	0	0	0
COMMERSONI	0	1	0	0	0	0
ETHEOSTOMA	0	29.54	0	0	0	0
ZONALE	0	0	0	0	0	0
TOTAL LARVAE	0	1	0	0	0	0
YOUNG	0	0	0	0	0	0
MICROPTERUS DOLOMIEUI	0	0	0	0	0	0
ETHEOSTOMA ZONALE	0	0	0	0	0	0
TOTAL YOUNG	0	0	0	0	0	0
TOTAL	0	1	0	0	0	0

NA Not Available.

TABLE 4-2-10 CONTINUED.

TIME PERIOD	2200			0400		
	SURFACE 2224	OBLIQUE 2210	OBLIQUE 0410	SURFACE 0402	OBLIQUE 0410	OBLIQUE 0410
STATION						
TIME	14:07			1:02		
RIVER STAGE (M)	14.0			20.0		
WATER TEMPERATURE (C)	9.9			8.6		
DISSOLVED OXYGEN (MG/L)				7.9		
PH						
NUMBER OF RIVER WATER PUMPS:	1			1		
NUCLEAR SERVICE	0			0		
SECONDARY SERVICE						
DECAY HEAT						
REPLICATE	A	B		A	B	
VOLUME SAMPLED (M ³)	3.3	3.3		3.2	3.3	
DENSITY	89.76	89.88		0.00	0.00	
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
	14.88	15.58	14.39	0.00	0.00	0.00
LARVAE	3	3	0	0	0	0
CYPRINUS	0	0	0	0	0	0
COMMERSONI	0	0	0	0	0	0
ETHEOSTOMA	0	0	0	0	0	0
ZONALE	0	0	0	0	0	0
TOTAL LARVAE	0	0	0	0	0	0
YOUNG	0	0	0	0	0	0
MICROPTERUS DOLOMIEUI	0	0	0	0	0	0
ETHEOSTOMA ZONALE	0	0	0	0	0	0
TOTAL YOUNG	0	0	0	0	0	0
TOTAL	3	3	0	0	0	0

TABLE #2-11

NUMBER IN3 AND DENSITY IN/100 M³ OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 2 INTAKE SUCTION BAY ON 15-16 JUNE 1982.

TIME PERIOD	1000	1600
STATION		
TIME		
RIVER STAGE (M)	2.04	2.01
WATER TEMPERATURE (C)	18.0	19.2
DISSOLVED OXYGEN (MG/L)	7.9	8.0
PH		
NUMBER OF RIVER WATER PUMPS:		
NUCLEAR SERVICE	1	1
SECONDARY SERVICE		
REPLICATE		
VOLUME SAMPLED (M ³)		
DENSITY		
MEAN DENSITY		
	A	A
	2.3	2.3
	0.00	0.00
	B	B
	2.2	2.3
	0.00	0.00
	M DENSITY	M DENSITY
	0.00	0.00
	N DENSITY	N DENSITY
	21.35	21.07
	NO LARVAE TAKEN	
LARVAE		
YOUNG		
NOTROPIS HUDSONIUS	1	0
ETHEOSTOMA OLMSTEDI	0	0
TOTAL YOUNG	1	0
TOTAL	1	0
NA Not Available.		

TABLE #2-11 CONTINUED.

TIME PERIOD	2200	0000
STATION		
TIME		
RIVER STAGE (M)	1.97	1.93
WATER TEMPERATURE (C)	19.0	19.7
DISSOLVED OXYGEN (MG/L)	7.7	7.9
PH		
NUMBER OF RIVER WATER PUMPS:		
NUCLEAR SERVICE	1	1
SECONDARY SERVICE		
REPLICATE		
VOLUME SAMPLED (M ³)		
DENSITY		
MEAN DENSITY		
	A	A
	2.1	2.2
	0.00	0.00
	B	B
	2.3	2.3
	0.00	0.00
	M DENSITY	M DENSITY
	0.00	0.00
	N DENSITY	N DENSITY
	0.00	0.00
	NO LARVAE TAKEN	
LARVAE		
YOUNG		
NOTROPIS HUDSONIUS	0	0
ETHEOSTOMA OLMSTEDI	0	0
TOTAL YOUNG	0	0
TOTAL	0	0

TABLE #2-12

NUMBER (N) AND DENSITY (N/100 M³) OF ICTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 1 INTAKE SUCTION BAY ON 22-23 JUNE 1982.

TIME PERIOD	1000		1600	
	SURFACE 1105	OBLIQUE 1111	SURFACE 1621	OBLIQUE 1614
STATION				
RIVER STAGE (M)	1.60		1.57	
WATER TEMPERATURE (C)	22.0		22.5	
DISSOLVED OXYGEN (MG/L)	8.2		8.2	
PH	8.4		7.8	
NUMBER OF RIVER WATER PUMPS:				
NUCLEAR SERVICE	1		1	
SECONDARY SERVICE	0		0	
DECAY HEAT				
REPLICATE				
VOLUME SAMPLED (M ³)	A 3.3	B 3.4	A 3.3	B 3.2
DENSITY	0.00	0.00	0.00	0.00
MEAN DENSITY	15.28	14.75	15.56	14.32
LARVAE	0	0	0	0
CYPRINUS	0	0	0	0
MUTROPIS	0	0	0	0
CYPRINUS	0	0	0	0
TOTAL LARVAE	0	0	0	0
YOUNG		NO YOUNG TAKEN		
TOTAL	0	0	0	0

TABLE #2-12 CONTINUED.

TIME PERIOD	2200		0400	
	SURFACE 2222	OBLIQUE 2228	SURFACE 0426	OBLIQUE 0416
STATION				
RIVER STAGE (M)	1.55		1.53	
WATER TEMPERATURE (C)	22.0		21.5	
DISSOLVED OXYGEN (MG/L)	7.9		7.6	
PH				
NUMBER OF RIVER WATER PUMPS:				
NUCLEAR SERVICE	1		1	
SECONDARY SERVICE	0		0	
DECAY HEAT				
REPLICATE				
VOLUME SAMPLED (M ³)	A 3.2	B 3.5	A 3.2	B 3.0
DENSITY	0.00	0.00	0.00	0.00
MEAN DENSITY	0.00	14.73	15.56	14.57
LARVAE	0	0	0	0
CYPRINUS	0	0	0	0
MUTROPIS	0	0	0	0
CYPRINUS	0	0	0	0
TOTAL LARVAE	0	0	0	0
YOUNG		NO YOUNG TAKEN		
TOTAL	0	0	0	0

TABLE 4.2-13

NUMBER (N) AND DENSITY (N/100 M³) OF ICTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 2 INTAKE SUCTION BAY ON 22-23 JUNE 1982.

TIME PERIOD	1000	1600
STATION		
RIVER STAGE (M)	1.40	1.57
WATER TEMPERATURE (C)	21.5	21.0
DISSOLVED OXYGEN (MG/L)	8.2	7.8
PH		
NUMBER OF RIVER WATER PUMPS:		
NUCLEAR SERVICE	1	1
SECONDARY SERVICE		
REPLICATE	A	A
VOLUME SAMPLED (M ³)	2.2	2.2
DENSITY	0.00	0.00
MEAN DENSITY	0.00	0.00
LARVAE		
NOIROPIS AHOMIUS	0	0
NOIROPIS HUDSONIUS	0	0
CARPIDES CYPRIUS	0	0
TOTAL LARVAE	0	0
YOUNG		
TOTAL	0	0

TABLE 4.2-13 CONTINUED.

TIME PERIOD	2200	0400
STATION		
RIVER STAGE (M)	1.55	1.51
WATER TEMPERATURE (C)	21.0	21.0
DISSOLVED OXYGEN (MG/L)	9.9	9.6
PH		
NUMBER OF RIVER WATER PUMPS:		
NUCLEAR SERVICE	1	1
SECONDARY SERVICE		
REPLICATE	A	A
VOLUME SAMPLED (M ³)	2.2	2.2
DENSITY	0.00	0.00
MEAN DENSITY	0.00	0.00
LARVAE		
NOIROPIS AHOMIUS	1	1
NOIROPIS HUDSONIUS	0	0
CARPIDES CYPRIUS	0	0
TOTAL LARVAE	1	1
YOUNG		
TOTAL	1	1

TABLE #2-1c

NUMBER (M) AND DENSITY (M/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 1 INTAKE SUCTION BAY ON 6-7 JULY 1982.

TIME PERIOD	1000			1600		
	SURFACE 1018	OBLIQUE 1010	OBLIQUE 1623	SURFACE 1616	OBLIQUE 1623	OBLIQUE 1623
STATION						
TIME	1:42			1:41		
RIVER STAGE (M)	2.2			23.5		
WATER TEMPERATURE (C)	8.1			8.1		
DISSOLVED OXYGEN (MG/L)						
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE	0			0		
DECAY HEAT						
REPLICATE	A	B		A	B	
VOLUME SAMPLED (M ³)	3.3	3.0		3.1	3.1	
DENSITY	0.00	0.00		0.00	0.00	
MEAN DENSITY	16.90	32.80		16.14	14.21	
LARVAE'S HUDSONIUS	0	0		0	0	
NOTROPIS	0	0		0	0	
SPILOPTERUS	0	0		0	0	
AMBLOPOMA	0	0		0	0	
EPHEMERA ZOMAE	0	32.80		0	0	
PERCINA PELTATA	0	0		0	0	
TOTAL LARVAE	0	32.80		0	0	
NO YOUNG TAKEN						
YOUNG	0	1		0	1	
TOTAL	0	1		0	1	

NA Not Available.

TABLE #2-1a CONTINUED.

TIME PERIOD	2200			0000		
	SURFACE 2209	OBLIQUE 2216	OBLIQUE 0007	SURFACE 0059	OBLIQUE 0007	OBLIQUE 0007
STATION						
TIME	1:40			1:39		
RIVER STAGE (M)	23.5			22.5		
WATER TEMPERATURE (C)	8.2			8.2		
DISSOLVED OXYGEN (MG/L)						
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE	0			0		
DECAY HEAT						
REPLICATE	A	B		A	B	
VOLUME SAMPLED (M ³)	2.9	2.9		3.0	3.0	
DENSITY	0.00	0.00		0.00	0.00	
MEAN DENSITY	0.00	0.00		16.20	67.07	
LARVAE'S HUDSONIUS	0	0		0	0	
NOTROPIS	0	0		0	0	
SPILOPTERUS	0	0		0	0	
AMBLOPOMA	0	0		0	0	
EPHEMERA ZOMAE	0	0		0	0	
PERCINA PELTATA	0	0		0	0	
TOTAL LARVAE	0	0		0	0	
NO YOUNG TAKEN						
YOUNG	0	0		1	3	
TOTAL	0	0		1	3	

TABLE 4-2-15

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPHAGANTON TAKEN BY 0.5 M NET IN THE UNIT 2 INTAKE SUCTION BAY ON 6-7 JULY 1982.

TIME PERIOD	1000			1600		
	SURFACE 1051	OBLIQUE 1056	OBLIQUE 1638	SURFACE 1645	OBLIQUE 1638	OBLIQUE 1638
STATION	142	142	142	143	143	143
RIVER STAGE (M)	23.2	23.2	23.2	23.5	23.5	23.5
WATER TEMPERATURE (C)	8.1	8.1	8.1	8.1	8.1	8.1
DISSOLVED OXYGEN (MG/L)	1	1	1	1	1	1
PH	1	1	1	1	1	1
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1	1	1	1	1	1
SECONDARY SERVICE	1	1	1	1	1	1
REPLICATE	A	B	A	B	A	B
VOLUME SAMPLED (M ³)	2.2	2.2	2.0	2.0	2.2	2.2
DENSITY (N/100 M ³)	0.00	45.39	0.00	0.00	46.37	46.37
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE	0	1	0	0	0	0
NOPTOPUS	0	1	0	0	0	0
SPHLOPTERUS	0	1	0	0	0	0
CYTHOSTOMA FEMALE	0	1	0	0	0	0
TOTAL LARVAE	0	1	0	0	0	0
YOUNG	NO YOUNG TAKEN					
TOTAL	0	1	0	0	1	0

NA: Not Available.

TABLE 4-2-15 CONTINUED.

TIME PERIOD	2200			0400		
	SURFACE 2258	OBLIQUE 2253	OBLIQUE 0412	SURFACE 0400	OBLIQUE 0412	OBLIQUE 0412
STATION	140	140	140	139	139	139
RIVER STAGE (M)	23.5	23.5	23.5	22.5	22.5	22.5
WATER TEMPERATURE (C)	8.2	8.2	8.2	8.2	8.2	8.2
DISSOLVED OXYGEN (MG/L)	1	1	1	1	1	1
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1	1	1	1	1	1
SECONDARY SERVICE	1	1	1	1	1	1
REPLICATE	A	B	A	B	A	B
VOLUME SAMPLED (M ³)	2.2	2.2	2.3	2.2	2.3	2.4
DENSITY (N/100 M ³)	46.26	23.13	0.00	22.18	0.00	0.00
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE	1	0	0	0	0	0
NOPTOPUS	0	0	0	0	0	0
SPHLOPTERUS	0	0	0	0	0	0
CYTHOSTOMA FEMALE	1	0	0	0	0	0
TOTAL LARVAE	1	0	0	0	0	0
YOUNG	NO YOUNG TAKEN					
TOTAL	1	0	0	0	0	0

TABLE #2-15

NUMBER IN) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY D-5 M NET IN THE UNIT 3 INTAKE SUCTION BAY ON 20-21 JULY 1982

TIME PERIOD	1000			1400		
	A	B	R	A	B	R
STATION	SURFACE 1036			SURFACE 1624		
WATER STA	OBLIQUE 1028			OBLIQUE 1633		
WATER TEMP	14.12			14.27		
PH	8.0			8.0		
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE						
SECONDARY SERVICE						
DECAY HEAT						
REPLICATE	1			1		
VOLUME SAMPLED (M ³)	3.6			3.3		
DENSITY	118.94			118.94		
MEAN DENSITY	579.81			11.81		
LARVAE	N DENSITY			N DENSITY		
CEPHELANUM	0.00	0.00	0.00	0.00	0.00	0.00
CYPRIDUS	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	0.00	0.00	0.00	0.00	0.00	0.00
NOIOPUS	0.00	0.00	0.00	0.00	0.00	0.00
AMBUSIPUS	0.00	0.00	0.00	0.00	0.00	0.00
AMBUSIPUS/L-MACROCHIRUS	0.00	0.00	0.00	0.00	0.00	0.00
AMBUSIPUS ZONALE	0.00	0.00	0.00	0.00	0.00	0.00
UNIDENTIFIED	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LARVAE	21	619.94	18	539.83	18	18
YOUNG	NO YOUNG TAKEN			NO YOUNG TAKEN		
TOTAL	21	619.94	18	539.83	18	18

TABLE #2-16 CONTINUED.

TIME PERIOD	2200			0400		
	A	B	R	A	B	R
STATION	SURFACE 2217			SURFACE 0436		
WATER STA	OBLIQUE 2225			OBLIQUE 0426		
WATER TEMP	11.12			11.10		
PH	8.2			8.2		
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE						
SECONDARY SERVICE						
DECAY HEAT						
REPLICATE	1			1		
VOLUME SAMPLED (M ³)	3.1			3.7		
DENSITY	28.30			109.67		
MEAN DENSITY	59.12			174.06		
LARVAE	N DENSITY			N DENSITY		
CEPHELANUM	0.00	0.00	0.00	0.00	0.00	0.00
CYPRIDUS	0.00	0.00	0.00	0.00	0.00	0.00
NOTROPIS	0.00	0.00	0.00	0.00	0.00	0.00
NOIOPUS	0.00	0.00	0.00	0.00	0.00	0.00
AMBUSIPUS	0.00	0.00	0.00	0.00	0.00	0.00
AMBUSIPUS/L-MACROCHIRUS	0.00	0.00	0.00	0.00	0.00	0.00
AMBUSIPUS ZONALE	0.00	0.00	0.00	0.00	0.00	0.00
UNIDENTIFIED	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL LARVAE	1	29.56	0	266.86	13	361.24
YOUNG	NO YOUNG TAKEN			NO YOUNG TAKEN		
TOTAL	1	29.56	0	266.86	13	361.24

TABLE #2-1A
 NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 1 INTAKE SUCTION BAY ON 10-11 AUGUST 1982.

TIME PERIOD	1000			1600		
	SURFACE 1150	ORLIQUE 1143	OBLIQUE 1602	SURFACE 1610	ORLIQUE 1602	OBLIQUE 1602
STATION	1-09	1-09	1-09	1-09	1-09	1-09
RIVER STAGE (M)	28-5	28-5	28-5	28-5	28-5	28-5
WATER TEMPERATURE (C)	7-8	7-8	7-8	7-8	7-8	7-8
DISSOLVED OXYGEN (MG/L)	8-3	8-3	8-3	8-3	8-3	8-3
PH	1	1	1	1	1	1
NUMBER OF RIVER WATER PUMPS:	1	1	1	1	1	1
NUCLEAR SERVICE	0	0	0	0	0	0
SECONDARY SERVICE	0	0	0	0	0	0
DELAY HEAT	0	0	0	0	0	0
REPLICATE	3-2	3-1	3-1	3-2	3-1	3-1
VOLUME SAMPLED (M ³)	282-22	175-41	0-00	93-91	257-8	65-48
DENSITY	175-81	0-00	0-00	175-87	175-87	175-87
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE						
NOTROPIS SPILOPTERUS	1	0	0	0	0	0
NOTROPIS VOUCHELLUS	0	0	0	0	0	0
NOTROPIS GIBBOSUS/L. - ACROCHIRUS	2	0	0	0	0	0
TOTAL LARVAE	3	0	0	0	0	0
YOUNG						
NOTROPIS SPILOPTERUS	0	0	0	0	0	0
NOTROPIS VOUCHELLUS	2	0	0	0	0	0
ICTALPUS PUNCTATUS	0	0	0	0	0	0
ALPHEUS RUPESSTRIS	0	0	0	0	0	0
LEPOMIS MACROCHIRUS	3	0	0	0	0	0
LEPOMIS GIBBOSUS/L. - MACROCHIRUS	2	0	0	0	0	0
TOTAL YOUNG	5	0	0	0	0	0
TOTAL	9	0	0	0	0	0

TABLE #2-1B CONTINUED.

TIME PERIOD	2200			0400		
	SURFACE 2205	ORLIQUE 2212	OBLIQUE 0415	SURFACE 0428	ORLIQUE 0415	OBLIQUE 0415
STATION	1-10	1-10	1-10	1-10	1-10	1-10
RIVER STAGE (M)	27-0	27-0	27-0	27-0	27-0	27-0
WATER TEMPERATURE (C)	7-8	7-8	7-8	7-8	7-8	7-8
DISSOLVED OXYGEN (MG/L)	1	1	1	1	1	1
PH	0	0	0	0	0	0
NUMBER OF RIVER WATER PUMPS:	1	1	1	1	1	1
NUCLEAR SERVICE	0	0	0	0	0	0
SECONDARY SERVICE	0	0	0	0	0	0
DELAY HEAT	0	0	0	0	0	0
REPLICATE	3-2	3-3	3-3	3-2	3-1	3-3
VOLUME SAMPLED (M ³)	142-59	1104-62	321-13	1104-11	477-62	60-57
DENSITY	1298-60	129-68	237-62	122-87	122-87	122-87
MEAN DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LARVAE						
NOTROPIS SPILOPTERUS	0	0	0	0	0	0
NOTROPIS VOUCHELLUS	3	0	0	0	0	0
NOTROPIS GIBBOSUS/L. - MACROCHIRUS	2	0	0	0	0	0
TOTAL LARVAE	5	0	0	0	0	0
YOUNG						
NOTROPIS SPILOPTERUS	6	0	0	0	0	0
NOTROPIS VOUCHELLUS	13	0	0	0	0	0
ALPHEUS PUNCTATUS	0	0	0	0	0	0
ALPHEUS RUPESSTRIS	3	0	0	0	0	0
LEPOMIS MACROCHIRUS	2	0	0	0	0	0
LEPOMIS GIBBOSUS/L. - MACROCHIRUS	42	0	0	0	0	0
TOTAL YOUNG	66	0	0	0	0	0
TOTAL	71	0	0	0	0	0

TABLE # 2-19

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 2 INTAKE SUCTION BAY ON 10-11 AUGUST 1982.

TIME PERIOD	1000			1600		
	SURFACE 1102	OBLIQUE 1112	OBLIQUE 1627	SURFACE 1625	OBLIQUE 1627	OBLIQUE 1627
STATION						
TIME	1:09			1:09		
RIVER STAGE (M)	23.5			23.5		
WATER TEMPERATURE (C)	7.9			7.9		
DISSOLVED OXYGEN (MG/L)	8.3			8.3		
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE						
REPLICATE						
VOLUME SAMPLED (M ³)	2.1	2.2	2.3	2.3	2.5	2.3
DENSITY	93.89	93.68	93.60	93.23	93.93	93.65
MEAN DENSITY	N DENSITY	M DENSITY	N DENSITY	M DENSITY	N DENSITY	M DENSITY
LARVAE						
CYPRINUS CARPIO	0	0	0	0	0	0
NOTROPIS SPILOPTERUS	1	0	0	0	0	0
NOTROPIS VOUCCELLUS	0	0	0	0	0	0
TOTAL LARVAE	1	0	0	0	0	0
YOUNG						
NOTROPIS AMOENUS	0	0	0	0	0	0
NOTROPIS CORNUTUS	0	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0	0
NOTROPIS VOUCCELLUS	0	0	0	0	0	0
LEPOMIS MACROCHIRUS	0	0	0	0	0	0
TOTAL YOUNG	0	0	0	0	0	0
TOTAL	1	0	0	0	0	0

TABLE # 2-19 CONTINUED.

TIME PERIOD	2200			0400		
	SURFACE 2257	OBLIQUE 2230	OBLIQUE 0458	SURFACE 0451	OBLIQUE 0458	OBLIQUE 0458
STATION						
TIME	1:10			1:10		
RIVER STAGE (M)	24.0			23.0		
WATER TEMPERATURE (C)	7.9			7.9		
DISSOLVED OXYGEN (MG/L)						
PH						
NUMBER OF RIVER WATER PUMPS:						
NUCLEAR SERVICE	1			1		
SECONDARY SERVICE						
REPLICATE						
VOLUME SAMPLED (M ³)	2.4	2.3	2.2	2.7	2.5	2.5
DENSITY	92.18	95.49	92.2	95.27	94.00	94.00
MEAN DENSITY	N DENSITY	M DENSITY	N DENSITY	M DENSITY	N DENSITY	M DENSITY
LARVAE						
CYPRINUS CARPIO	0	0	0	0	0	0
NOTROPIS SPILOPTERUS	1	0	0	0	0	0
NOTROPIS VOUCCELLUS	0	0	0	0	0	0
TOTAL LARVAE	1	0	0	0	0	0
YOUNG						
NOTROPIS AMOENUS	0	0	0	0	0	0
NOTROPIS CORNUTUS	0	0	0	0	0	0
NOTROPIS SPILOPTERUS	0	0	0	0	0	0
NOTROPIS VOUCCELLUS	0	0	0	0	0	0
LEPOMIS MACROCHIRUS	0	0	0	0	0	0
TOTAL YOUNG	0	0	0	0	0	0
TOTAL	1	0	0	0	0	0

TABLE A-2-20
 NUMBER (M³) AND DENSITY (MG/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE U. S. 1 INTAKE SUCTION BAY ON 24-25 AUGUST 1982.

TIME PERIOD	1000		1600	
	SURFACE 1001	OBLIQUE 1008	SURFACE 155	OBLIQUE 1559
STATION				
RIVER STAGE (M)	0.98		0.98	
WATER TEMPERATURE (C)	21.2		21.5	
DISSOLVED OXYGEN (MG/L)	8.3		10.2	
NUMBER OF RIVER WATER PUMPS:				
NUCLEAR SERVICE	1		1	
SECONDARY SERVICE	0		0	
DECAY HEAT				
REPLICATE	A	B	A	B
VOLUME SAMPLED (M ³)	3.0	2.8	2.9	3.4
DENSITY	0.00	0.00	0.00	0.00
MEAN DENSITY	67.02	59.35	0.00	0.00
	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LABA:				
NOTROPIS SPILOPTERUS	0	0	0	0
NOTROPIS VOUCHELLUS	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0	0	0
TOTAL LARVAE	0	0	0	0
YOUNG				
NOTROPIS SPILOPTERUS	0	0	0	0
NOTROPIS VOUCHELLUS	2	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0	0	0
TOTAL YOUNG	2	0	0	0
TOTAL	2	0	0	0

TABLE A-2-20 CONTINUED.

TIME PERIOD	2200		0400	
	SURFACE 2211	OBLIQUE 2206	SURFACE 0429	OBLIQUE 0437
STATION				
RIVER STAGE (M)	0.99		0.99	
WATER TEMPERATURE (C)	24.5		24.0	
DISSOLVED OXYGEN (MG/L)	12.0		9.9	
NUMBER OF RIVER WATER PUMPS:				
NUCLEAR SERVICE	1		1	
SECONDARY SERVICE	0		0	
DECAY HEAT				
REPLICATE	A	B	A	B
VOLUME SAMPLED (M ³)	2.8	2.9	3.2	3.0
DENSITY	0.00	0.00	0.00	0.00
MEAN DENSITY	51.29	68.00	61.67	58.18
	N DENSITY	N DENSITY	N DENSITY	N DENSITY
LABA:				
NOTROPIS SPILOPTERUS	0	0	0	0
NOTROPIS VOUCHELLUS	0	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	0	0	0	0
TOTAL LARVAE	0	0	0	0
YOUNG				
NOTROPIS SPILOPTERUS	0	0	0	0
NOTROPIS VOUCHELLUS	1	0	0	0
LEPOMIS GIBBOSUS/L. MACROCHIRUS	1	0	0	0
TOTAL YOUNG	2	0	0	0
TOTAL	2	0	0	0

TABLE A-2-21

NUMBER (N) AND DENSITY (N/100 M³) OF ICHTHYOPLANKTON TAKEN BY 0.5 M NET IN THE UNIT 2 INTAKE SUCTION BAY ON 24-25 AUGUST 1982.

TIME PERIOD	1000	1600
STATION	SURFACE 1052	SURFACE 1635
TIME		
RIVER STAGE (M)		
WATER TEMPERATURE (C)	0.98	0.98
DISSOLVED OXYGEN (MG/L)	21.5	21.0
PH	9.8	11.2
NUMBER OF RIVER WATER PUMPS:		
NUCLEAR SERVICE	1	1
SECONDARY SERVICE		
REPLICATE		
VOLUME SAMPLED (M ³)		
DENSITY		
MEAN DENSITY		
LARVAE		
NOTROPIS SPILOPTERUS		
TOTAL LARVAE		
YOUNG		
NOTROPIS SPILOPTERUS		
TOTAL YOUNG		
TOTAL		

TABLE A-2-21 CONTINUED.

TIME PERIOD	2200	0900
STATION	SURFACE 2238	SURFACE 0910
TIME		
RIVER STAGE (M)		
WATER TEMPERATURE (C)	0.99	0.99
DISSOLVED OXYGEN (MG/L)	25.0	20.1
PH	11.1	8.1
NUMBER OF RIVER WATER PUMPS:		
NUCLEAR SERVICE	1	1
SECONDARY SERVICE		
REPLICATE		
VOLUME SAMPLED (M ³)		
DENSITY		
MEAN DENSITY		
LARVAE		
NOTROPIS SPILOPTERUS		
TOTAL LARVAE		
YOUNG		
NOTROPIS SPILOPTERUS		
TOTAL YOUNG		
TOTAL		

Table 4.2-22

Occurrence of ichthyoplankton taxa taken in entrainment studies at TMSD Unit 1, 11 May through 23 August 1982. The presence of each taxon is indicated by an X.

	May 11-12	May 23-25	Jun 13-16	Jun 22-23	Jul 6-7	Jul 20-21	Aug 10-11	Aug 23-25
LARVAE	X	X	X	X	X	X	X	X
<i>Leuciscus cepedianus</i>	-	-	-	-	-	X	-	-
<i>Notropis atherin</i>	-	-	-	X	-	X	-	-
<i>Notropis heterodon</i>	-	X	-	-	-	-	-	X
<i>N. hubbsi</i>	X	X	-	X	X	X	-	X
<i>N. spilargenteus</i>	-	-	-	-	X	X	X	X
<i>N. virgatus</i>	-	-	-	X	X	X	X	-
<i>Parachanna obscura</i>	X	X	X	X	-	-	-	-
<i>Stizostedion commersoni</i>	X	X	X	-	-	-	-	-
<i>Micropterus salmoides</i>	-	-	-	-	X	X	-	-
<i>Lepomis gibbosus</i> / <i>macrochirus</i>	-	X	-	-	-	X	X	X
<i>Lithognathus cinctatus</i>	X	X	-	-	-	-	-	-
<i>E. punctata</i>	X	X	X	X	X	X	-	-
<i>Petilia pumila</i>	X	X	-	-	X	-	-	-
Unidentified larvae	-	-	-	-	-	X	-	-
YOUNG	-	-	X	-	-	-	X	-
<i>Notropis spilargenteus</i>	-	-	-	-	-	-	X	X
<i>N. virgatus</i>	-	-	-	-	-	-	X	X
<i>Stizostedion commersoni</i>	-	-	-	-	-	-	X	-
<i>Micropterus salmoides</i>	-	-	-	-	-	-	X	-
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	-	-
<i>Lepomis macrochirus</i>	-	-	-	-	-	-	X	X
<i>Lepomis gibbosus</i> / <i>macrochirus</i>	-	-	-	-	-	-	X	X
<i>Lithognathus cinctatus</i>	-	-	-	-	-	-	-	-

Table 4.2-23

Occurrence of ichthyoplankton taxa taken in entrainment studies at TMSD Unit 2, 11 May through 23 August 1982. The presence of each taxon is indicated by an X.

	May 11-12	May 23-25	Jun 15-16	Jun 22-23	Jul 6-7	Jul 20-21	Aug 10-11	Aug 23-25
LARVAE	X	X	X	X	X	X	X	X
<i>Leuciscus cepedianus</i>	-	-	-	-	-	-	X	-
<i>Notropis heterodon</i>	-	X	-	X	-	-	-	-
<i>N. hubbsi</i>	X	X	-	X	-	X	-	-
<i>N. spilargenteus</i>	-	-	-	-	X	X	X	X
<i>N. virgatus</i>	-	-	-	-	-	-	X	-
<i>Parachanna obscura</i>	X	X	-	X	-	-	-	-
<i>Stizostedion commersoni</i>	X	X	-	-	-	-	-	-
<i>Lepomis gibbosus</i> / <i>macrochirus</i>	-	-	-	-	-	X	-	-
<i>Lithognathus cinctatus</i>	X	-	-	-	-	-	-	-
<i>E. punctata</i>	X	X	-	-	X	X	-	-
<i>Petilia pumila</i>	X	X	-	-	-	-	-	-
YOUNG	-	-	X	-	-	-	X	X
<i>Notropis heterodon</i>	-	-	-	-	-	-	X	-
<i>N. hubbsi</i>	-	-	-	-	-	-	X	-
<i>N. spilargenteus</i>	-	-	X	-	-	-	-	-
<i>N. virgatus</i>	-	-	-	-	-	-	X	X
<i>Lepomis macrochirus</i>	-	-	-	-	-	-	X	-
<i>Lithognathus cinctatus</i>	-	-	X	X	X	-	-	-

Table 4.2-24

Summary of mean density (n/100 m³) of ichthyoplankton taken by 0.5 m net during entrainment studies at TMINS Unit 11 May through 25 August 1982.

	May 11-12	May 25-26	Jun 15-16	Jun 22-23	Jul 6-7	Jul 20-21	Aug 10-11	Aug 24-25	MEAN
SURFACE									
LARVAE									
<i>Dorosoma cepedianum</i>	-	-	-	-	-	3.68	-	-	0.46
<i>Cyprinus carpio</i>	-	4.03	-	3.91	-	3.79	-	-	1.47
<i>Notropis anogenus</i>	-	8.06	-	-	-	-	-	-	1.01
<i>N. hudsonius</i>	177.09	47.05	-	7.69	4.03	3.68	-	-	29.94
<i>N. spilopterus</i>	-	-	-	-	-	44.23	38.95	-	10.40
<i>N. volucellus</i>	-	-	-	-	-	25.96	62.05	-	11.00
<i>Carpiodes cyprinus</i>	3.91	23.59	11.36	-	-	-	-	-	4.5
<i>Catostomus commersoni</i>	7.95	-	3.68	-	-	-	-	-	1.43
<i>Ambloplites rupestris</i>	-	-	-	-	4.03	-	-	-	0.50
<i>Lepomis gibbosus/L. macrochirus</i>	-	4.03	-	-	-	159.88	27.01	4.31	24.40
<i>Etheostoma olivstedii</i>	-	4.03	-	-	-	-	-	-	0.50
<i>E. zonale</i>	16.03	27.87	-	-	4.17	3.68	-	-	6.47
<i>Percina peltata</i>	58.32	-	-	-	-	-	-	-	7.29
Unidentified	-	-	-	-	-	3.91	-	-	0.49
Total Larvae	263.31	114.68	15.04	11.60	12.23	248.79	128.01	4.31	100.25
YOUNG									
<i>Notropis spilopterus</i>	-	-	-	-	-	-	97.70	11.72	13.68
<i>N. volucellus</i>	-	-	-	-	-	-	327.39	29.94	44.67
<i>Lepomis macrochirus</i>	-	-	-	-	-	-	61.57	-	7.70
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	15.40	-	1.92
Total Young	-	-	-	-	-	-	502.06	41.66	67.97
TOTAL	263.31	114.68	15.04	11.60	12.23	248.79	630.07	45.97	168.21
OBLIQUE									
LARVAE									
<i>Dorosoma cepedianum</i>	-	-	-	-	-	4.03	-	-	0.50
<i>Cyprinus carpio</i>	-	7.26	-	-	-	3.57	-	-	1.35
<i>Notropis hudsonius</i>	155.48	18.10	-	7.71	-	-	-	-	22.66
<i>N. spilopterus</i>	-	-	-	-	8.33	21.25	42.94	4.17	9.5
<i>N. volucellus</i>	-	-	-	-	-	25.25	-	-	3.1
<i>Carpiodes cyprinus</i>	-	22.74	-	15.45	-	-	-	-	4.77
<i>Catostomus commersoni</i>	11.83	7.94	-	-	-	-	-	-	2.47
<i>Ambloplites rupestris</i>	-	-	-	-	-	3.38	-	-	0.42
<i>Lepomis gibbosus/L. macrochirus</i>	-	-	-	-	-	79.03	11.39	-	11.30
<i>Etheostoma olivstedii</i>	4.03	-	-	-	-	-	-	-	0.50
<i>E. zonale</i>	47.05	116.75	3.57	8.33	-	-	-	-	21.96
<i>Percina peltata</i>	65.69	3.68	-	-	3.57	-	-	-	9.12
Total Larvae	284.07	176.46	3.57	23.16	20.24	136.52	54.32	4.17	87.81
YOUNG									
<i>Notropis spilopterus</i>	-	-	-	-	-	-	7.71	-	0.96
<i>N. volucellus</i>	-	-	-	-	-	-	11.85	-	1.48
<i>Ictalurus punctatus</i>	-	-	-	-	-	-	4.03	-	0.50
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	4.03	-	0.50
<i>Micropterus dolomieu</i>	-	-	3.57	-	-	-	-	-	0.45
<i>Lepomis macrochirus</i>	-	-	-	-	-	-	12.10	8.63	2.59
<i>L. gibbosus/L. macrochirus</i>	-	-	-	-	-	-	19.09	4.17	2.91
<i>Etheostoma zonale</i>	-	-	3.91	-	-	-	-	-	0.49
Total Young	-	-	7.48	-	-	-	58.82	12.80	9.89
TOTAL	284.07	176.46	11.05	23.16	20.24	136.52	113.14	16.96	97.70
Mean Larvae	273.69	147.57	9.31	17.38	16.23	192.66	91.17	4.24	94.03
Mean Young	-	-	3.74	-	-	-	280.44	27.23	38.93
GRAND MEAN	273.69	147.57	13.04	17.38	16.23	192.66	371.61	31.47	132.96

Table 4.2-25

Summary of mean density (n/100 m³) of ichthyoplankton taken by 0.5 m net during entrainment studies at TMIN Unit 2, May through 25 August 1982.

	May 11-12	May 25-26	Jun 15-16	Jun 22-23	Jul 6-7	Jul 20-21	Aug 10-11	Aug 24-25	MEAN
SURFACE									
LARVAE									
<i>Notropis amoenus</i>	-	5.43	-	10.87	-	-	-	-	2.04
<i>N. hudsonius</i>	125.45	-	-	-	-	5.21	-	-	16.33
<i>N. spilopterus</i>	-	-	-	-	16.80	25.63	44.51	11.36	12.29
<i>N. volucellus</i>	-	-	-	-	-	-	5.68	-	0.71
<i>Cariodes cyprinus</i>	11.90	5.43	-	-	-	-	-	-	2.17
<i>Catostomus commersoni</i>	5.95	5.43	-	-	-	-	-	-	1.42
<i>Lepomis gibbosus/L. macrochirus</i>	-	-	-	-	-	20.63	-	-	2.58
<i>Etheostoma zonale</i>	63.41	114.38	-	-	5.43	5.43	-	-	23.58
<i>Percina peltata</i>	5.95	5.43	-	-	-	-	-	-	1.42
Total Larvae	212.67	136.12	-	10.87	22.23	56.89	50.19	11.36	61.54
YOUNG									
<i>Notropis amoenus</i>	-	-	-	-	-	-	5.68	-	0.71
<i>N. spilopterus</i>	-	-	-	-	-	-	10.43	63.58	9.25
<i>N. volucellus</i>	-	-	-	-	-	-	5.43	-	0.68
Total Young	-	-	-	-	-	-	21.55	63.58	10.64
TOTAL	212.67	136.12	-	10.87	22.23	56.89	71.74	74.95	73.18
OBLIQUE									
LARVAE									
<i>Cyprinus carpio</i>	-	-	-	-	-	-	5.00	-	0.63
<i>Notropis hudsonius</i>	100.84	22.25	-	16.82	-	5.21	-	-	18.14
<i>N. spilopterus</i>	-	-	-	-	-	15.22	16.36	5.	4.57
<i>Cariodes cyprinus</i>	-	31.93	-	5.21	-	-	-	-	4.64
<i>Lepomis gibbosus/L. macrochirus</i>	-	-	-	-	-	31.25	-	-	3.91
<i>Etheostoma cimbstedti</i>	5.68	-	-	-	-	-	-	-	0.71
<i>E. zonale</i>	17.86	65.28	-	-	11.93	5.21	-	-	12.53
<i>Percina peltata</i>	5.95	-	-	-	-	-	-	-	0.74
Total Larvae	130.33	119.46	-	22.03	11.93	56.89	21.36	5.00	45.88
YOUNG									
<i>Notropis cornutus</i>	-	-	-	-	-	-	5.00	-	0.63
<i>N. hudsonius</i>	-	-	5.43	-	-	-	-	-	0.68
<i>N. spilopterus</i>	-	-	-	-	-	-	5.43	30.85	4.54
<i>N. volucellus</i>	-	-	-	-	-	-	5.43	-	0.68
<i>Lepomis macrochirus</i>	-	-	-	-	-	-	5.68	-	0.71
<i>Etheostoma cimbstedti</i>	-	-	5.21	-	-	-	-	-	0.65
Total Young	-	-	10.64	-	-	-	21.55	30.85	7.88
TOTAL	130.33	119.46	10.64	22.03	11.93	56.89	42.92	35.85	53.76
Mean Larvae	171.50	127.79	-	16.45	17.08	56.89	35.78	8.18	54.21
Mean Young	-	-	5.32	-	-	-	21.55	47.22	9.26
GRAND MEAN	171.50	127.79	5.32	16.45	17.08	56.89	57.33	55.40	63.47

Table 4.2-25

Summary of mean density (in/100 m³) by family of ichthyoplankton taken by 0.5 m net at 1000, 1600, 2200, and 0400 h in surface (S) and oblique (O) rows during entrainment studies at TMISO Unit 1, 11 May through 25 August 1982.

		Lugilidae				Cyprinidae				Clupeidae				Ictaluridae			
		1000	1600	2200	0400	1000	1600	2200	0400	1000	1600	2200	0400	1000	1600	2200	0400
11-12 May	S	-	-	-	-	50.87	46.86	158.33	452.59	16.67	15.15	-	15.63	-	-	-	-
	O	-	-	-	-	76.91	172.48	116.32	266.20	-	13.16	15.63	16.52	-	-	-	-
25-26 May	S	-	-	-	-	-	-	29.86	112.90	-	-	29.86	64.52	-	-	-	-
	O	-	-	-	-	16.13	-	58.08	45.77	16.13	15.63	29.04	61.90	-	-	-	-
15-16 Jun	S	-	-	-	-	-	-	-	-	14.71	-	45.45	-	-	-	-	-
	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22-23 Jun	S	-	-	-	-	15.13	15.63	-	15.63	-	-	-	-	-	-	-	-
	O	-	-	-	-	-	-	14.71	16.13	14.71	14.29	-	32.60	-	-	-	-
6-7 Jul	S	-	-	-	-	-	16.13	-	-	-	-	-	-	-	-	-	-
	O	-	-	-	-	-	-	-	33.33	-	-	-	-	-	-	-	-
20-21 Jul	S	-	-	14.71	-	90.02	-	14.71	205.88	-	-	-	-	-	-	-	-
	O	-	-	16.13	-	14.29	28.57	32.26	125.20	-	-	-	-	-	-	-	-
10-11 Aug	S	-	-	-	-	61.58	128.53	125.95	798.51	-	-	-	-	-	-	-	-
	O	-	-	-	-	-	80.65	124.74	44.59	-	-	-	-	-	-	16.13	-
24-25 Aug	S	-	-	-	-	69.05	-	35.10	62.50	-	-	-	-	-	-	-	-
	O	-	-	-	-	-	-	-	16.67	-	-	-	-	-	-	-	-

Table 4.2-26 continued.

		Centrarchidae				Percidae				Total			
		1000	1600	2200	0400	1000	1600	2200	0400	1000	1600	2200	0400
11-12 May	S	-	-	-	-	68.37	46.85	-	181.51	136.21	108.90	158.73	549.78
	O	-	-	-	-	143.37	106.69	27.78	189.24	210.27	292.32	159.72	472.96
25-26 May	S	-	-	-	16.13	32.26	16.13	14.71	64.52	32.26	16.13	74.42	258.06
	O	-	-	-	-	174.40	14.71	58.08	234.52	206.65	30.33	145.20	347.20
15-16 Jun	S	-	-	-	-	-	-	-	-	14.71	-	45.45	-
	O	-	14.29	-	-	14.29	-	15.63	-	14.29	14.29	15.63	-
22-23 Jun	S	-	-	-	-	-	-	-	-	15.13	15.63	-	15.63
	O	-	-	-	-	-	-	-	-	14.71	14.29	14.71	48.92
6-7 Jul	S	-	-	-	16.13	16.67	-	-	-	16.67	16.13	-	16.13
	O	-	-	-	-	-	14.29	-	33.33	-	14.29	-	66.67
20-21 Jul	S	491.53	15.63	14.71	117.65	-	-	14.71	-	581.55	15.63	58.82	323.53
	O	101.68	27.78	62.67	137.52	-	-	-	-	113.97	54.35	111.06	262.72
10-11 Aug	S	167.28	47.38	189.51	31.75	-	-	-	-	226.06	175.91	1295.45	820.06
	O	-	48.39	138.05	-	-	-	-	-	-	129.03	278.94	44.59
24-25 Aug	S	-	-	17.24	-	-	-	-	-	69.05	-	52.34	62.50
	O	-	-	35.33	17.86	-	-	-	-	-	-	33.33	34.52

Table 4.2-27

Summary of mean density (n/100 m³) by family of ichthyoplankton taken by 0.5 m net at 1000, 1600, 2200, and 0400 h in surface (S) and oblique (O) tows during entrainment studies at TMINS Unit 2, 11 May through 25 August 1962.

		Cyprinidae				Catostomidae				Centrarchidae			
		1000	1600	2200	0400	1000	1600	2200	0400	1000	1600	2200	0400
11-12 May	S	47.62	220.24	166.67	67.29	-	-	47.62	23.81	-	-	-	-
	O	23.81	45.45	265.91	68.18	-	-	-	-	-	-	-	-
25-26 May	S	-	21.74	-	-	-	-	21.74	21.74	-	-	-	-
	O	22.73	-	15.45	20.83	-	-	-	127.72	-	-	-	-
15-16 Jun	S	-	-	-	-	-	-	-	-	-	-	-	-
	O	21.74	-	-	-	-	-	-	-	-	-	-	-
22-23 Jun	S	-	-	21.74	21.74	-	-	-	-	-	-	-	-
	O	-	-	23.81	43.48	-	20.83	-	-	-	-	-	-
6-7 Jul	S	22.73	-	22.73	21.74	-	-	-	-	-	-	-	-
	O	-	-	-	-	-	-	-	-	-	-	-	-
20-21 Jul	S	-	-	62.50	60.83	-	-	-	-	-	-	41.67	40.83
	O	-	-	19.23	62.50	-	-	-	-	-	20.83	41.67	62.50
10-11 Aug	S	43.81	43.48	86.05	113.64	-	-	-	-	-	-	-	-
	O	-	103.48	45.45	-	-	-	-	-	22.73	-	-	-
24-25 Aug	S	22.73	140.69	90.91	45.45	-	-	-	-	-	-	-	-
	O	61.67	40.00	41.74	-	-	-	-	-	-	-	-	-

Table 4.2-27 continued.

		Percidae				Total			
		1000	1600	2200	0400	1000	1600	2200	0400
11-12 May	S	47.62	23.81	-	206.00	95.24	244.05	214.29	297.10
	O	95.24	-	22.73	-	119.05	45.45	288.64	68.18
25-26 May	S	-	66.21	-	413.04	-	87.94	21.74	434.78
	O	45.45	22.73	-	192.93	68.18	22.73	45.45	341.49
15-16 Jun	S	-	-	-	-	-	-	-	-
	O	-	20.83	-	-	21.74	20.83	-	-
22-23 Jun	S	-	-	-	-	-	-	21.74	21.74
	O	-	-	-	-	-	20.83	23.81	43.48
6-7 Jul	S	-	21.74	-	-	22.73	21.74	22.73	21.74
	O	25.00	22.73	-	-	25.00	22.73	-	-
20-21 Jul	S	-	21.74	-	-	-	21.74	104.17	101.67
	O	-	20.83	-	-	-	41.67	60.90	125.00
10-11 Aug	S	-	-	-	-	43.81	43.48	86.05	113.64
	O	-	-	-	-	22.73	103.48	45.45	-
24-25 Aug	S	-	-	-	-	22.73	140.69	90.91	45.45
	O	-	-	-	-	61.67	40.00	41.74	-

Table 4.2-18

Summary of mean density (n/100 m³) and percent composition (%) by family of ichthyoplankton taken in surface (S) and oblique (O) tows by 0.5 m net during entrainment studies at TMINS Unit 1, 11 May through 25 August 1982.

		Clupeidae		Cyprinidae		Catostomidae		Ictaluridae		Centrarchidae		Percidae		Total n/100 m ³
		n/100 m ³	%	n/100 m ³	%	n/100 m ³	%	n/100 m ³	%	n/100 m ³	%	n/100 m ³	%	
11-12 May	S	-	-	177.09	67.3	11.86	4.5	-	-	-	-	74.35	28.2	263.31
	O	-	-	155.68	56.7	11.83	4.2	-	-	-	-	116.77	41.1	284.07
25-26 May	S	-	-	35.69	37.5	23.59	24.8	-	-	4.03	4.2	31.90	33.3	95.22
	O	-	-	30.00	16.6	30.67	16.9	-	-	-	-	120.43	66.5	181.10
15-16 Jun	S	-	-	-	-	15.04	100.0	-	-	-	-	-	-	15.04
	O	-	-	-	-	-	-	-	-	3.37	32.3	7.48	67.7	11.05
22-23 Jun	S	-	-	11.60	100.0	-	-	-	-	-	-	-	-	11.60
	O	-	-	7.71	33.3	13.45	66.7	-	-	-	-	-	-	23.16
6-7 Jul	S	-	-	4.03	33.0	-	-	-	-	4.03	33.0	4.17	34.1	12.23
	O	-	-	8.33	41.2	-	-	-	-	-	-	11.90	58.8	20.24
20-21 Jul	S	3.89	1.5	77.63	31.7	-	-	-	-	159.88	65.3	3.68	1.5	244.88
	O	4.03	3.0	50.08	26.7	-	-	-	-	82.41	60.4	-	-	136.52
10-11 Aug	S	-	-	526.09	83.5	-	-	-	-	103.98	16.5	-	-	630.07
	O	-	-	67.50	55.2	-	-	4.03	3.6	46.61	41.2	-	-	113.14
24-25 Aug	S	-	-	41.66	90.6	-	-	-	-	4.31	9.4	-	-	45.97
	O	-	-	4.17	26.6	-	-	-	-	12.80	75.5	-	-	16.96
Mean	S	0.46	0.3	109.23	66.3	6.31	3.6	-	-	34.53	21.0	14.26	8.7	164.79
	O	0.30	0.3	39.78	40.5	7.24	7.4	0.50	0.5	18.17	18.5	37.07	32.6	98.26
GRAND MEAN		0.48	0.4	74.51	56.6	6.78	5.2	0.25	0.2	26.35	20.0	23.17	17.6	131.53

Table 4.2-19

Summary of mean density (n/100 m³) and percent composition (%) by family of ichthyoplankton taken in surface (S) and oblique (O) tows by 0.5 m net during entrainment studies at TMINS Unit 2, 11 May through 25 August 1982.

		Cyprinidae		Catostomidae		Centrarchidae		Percidae		Total n/100 m ³
		n/100 m ³	%	n/100 m ³	%	n/100 m ³	%	n/100 m ³	%	
11-12 May	S	125.45	59.0	17.86	8.4	-	-	69.36	32.6	212.67
	O	100.84	77.4	-	-	-	-	29.49	22.6	130.33
25-26 May	S	5.43	4.0	10.87	8.0	-	-	119.81	88.0	136.12
	O	22.55	18.4	31.93	26.7	-	-	65.28	54.6	119.46
15-16 Jun	S	-	-	-	-	-	-	-	-	-
	O	5.43	51.0	-	-	-	-	5.21	49.0	10.64
22-23 Jun	S	10.87	100.0	-	-	-	-	-	-	10.87
	O	16.82	76.4	5.21	23.6	-	-	-	-	22.03
6-7 Jul	S	16.80	75.6	-	-	-	-	5.43	24.4	22.23
	O	-	-	-	-	-	-	11.93	100.0	11.93
20-21 Jul	S	30.83	34.2	-	-	20.63	36.3	5.43	9.5	56.89
	O	20.43	35.9	-	-	31.25	54.9	5.21	9.2	56.89
10-11 Aug	S	71.74	100.0	-	-	-	-	-	-	71.74
	O	37.23	86.7	-	-	5.68	13.2	-	-	42.92
24-25 Aug	S	74.95	100.0	-	-	-	-	-	-	74.95
	O	35.85	100.0	-	-	-	-	-	-	35.85
Mean	S	42.01	57.4	3.59	4.9	2.58	3.5	25.00	34.2	73.18
	O	29.86	35.5	4.64	8.6	4.62	8.6	14.64	27.2	53.76
GRAND MEAN		35.94	56.6	4.12	6.5	3.60	5.7	19.82	31.2	63.47

Table 4.2-30

Summary of mean density ($n/100\text{ m}^3$) and percent composition (%) of ichthyoplankton taken by 0.5 m net during entrainment studies at TPCO Units 1 and 2, 1976 through 1982. Minimum, maximum, and grand mean densities were calculated for 1976 through 1981 at Unit 1 and 1978 through 1981 at Unit 2. Surface and oblique samples were combined for table.

	Unit 1					Unit 2					
	1976 through 1981				1982	1978 through 1981				1982	
	$n/100\text{ m}^3$		$n/100\text{ m}^3$	%	$n/100\text{ m}^3$	%	$n/100\text{ m}^3$		%	$n/100\text{ m}^3$	%
	Min	Max	Grand Mean				Min	Max	Grand Mean		
LARVAE											
<i>Aloes pseudoharengus</i>	-	0.33	0.07	+	-	-	-	-	-	-	-
<i>Dorosoma cepedianum</i>	-	2.55	0.43	0.1	0.48	0.4	-	0.73	0.18	0.1	-
Cyprinidae	-	1.22	0.33	0.1	-	-	-	-	-	-	-
<i>Camptostoma/Noemius/Demotilus</i>	-	0.20	0.03	+	-	-	-	-	-	-	-
<i>Cyprinus carpio</i>	2.92	24.80	10.33	3.3	1.41	1.1	1.49	31.15	10.88	6.4	0.31
<i>Notropis cornutus</i>	-	1.52	0.36	0.1	-	-	-	-	-	-	-
<i>Notropis cornutus</i>	-	1.43	0.80	0.3	6.50	0.4	-	1.05	0.47	0.3	1.02
<i>N. hudsonius</i>	14.56	58.09	36.09	11.0	26.30	19.8	1.09	57.10	20.17	11.8	17.24
<i>N. spilopterus</i>	5.50	52.80	19.59	6.3	9.99	7.5	7.29	23.04	11.47	6.7	8.43
<i>N. volucellus</i>	-	2.93	0.89	0.3	7.08	5.3	-	1.51	0.74	0.4	0.34
<i>Pimephales notatus</i>	-	0.24	0.04	+	-	-	-	-	-	-	-
<i>Rhinichthys</i> spp.	-	-	-	-	-	-	-	0.39	0.10	+	-
<i>Senotilus atromaculatus</i>	-	0.25	0.06	+	-	-	-	-	-	-	-
<i>S. corporalis</i>	-	7.52	0.17	+	-	-	-	-	-	-	-
<i>Garrulus cynimus</i>	3.02	24.49	12.94	3.9	4.82	3.6	3.08	25.44	11.75	6.2	3.60
<i>Catostomus commersoni</i>	1.44	22.11	10.29	3.3	1.96	1.5	2.58	6.89	4.08	2.4	0.71
<i>Notostomus macrolepidotum</i>	0.25	15.26	4.24	1.4	-	-	-	1.32	0.33	0.2	-
<i>Ambloplites rupestris</i>	0.23	2.70	1.19	0.4	0.46	0.3	-	0.39	0.18	0.1	-
<i>Lepomis auritus</i>	-	1.41	0.41	0.2	-	-	-	-	-	-	-
<i>L. cyanellus</i>	-	0.73	0.13	+	-	-	-	-	-	-	-
<i>L. macrochirus</i>	-	-	-	-	-	-	-	0.30	0.08	+	-
<i>L. gibbosus/L. macrochirus</i>	8.60	412.09	115.24	37.1	17.85	13.4	2.36	48.24	23.68	13.9	3.70
<i>Micropterus dolomieu</i>	-	2.84	0.52	0.2	-	-	-	0.36	0.09	+	-
<i>Percis</i> spp.	-	0.27	0.08	+	-	-	-	1.23	0.31	0.2	-
<i>Percidae</i>	-	0.47	0.09	+	-	-	-	-	-	-	-
<i>Etheostoma olivaceum</i>	-	1.21	0.47	0.2	0.50	0.4	0.32	9.66	3.70	2.2	0.36
<i>E. zonale</i>	7.69	168.35	58.67	18.9	14.22	10.7	15.75	72.71	68.85	28.6	18.06
<i>E. olivaceum/E. zonale</i>	-	0.96	0.16	+	-	-	-	-	-	-	-
<i>Percina peltata</i>	5.76	41.41	17.65	5.7	8.20	6.2	2.71	37.21	16.97	9.9	1.08
<i>Stizostedion vitreum vitreum</i>	-	1.64	0.48	0.2	-	-	-	-	-	-	-
Unidentified	-	-	-	-	0.24	0.2	-	-	-	-	-
Total Larvae	130.91	301.62	289.02	93.1	96.03	70.7	54.58	268.88	154.00	90.2	34.21
YOUNG											
<i>Camptostoma anomalum</i>	-	-	-	-	-	-	-	0.41	0.10	+	-
<i>Notropis cornutus</i>	-	2.55	0.59	0.2	-	-	-	0.37	0.09	+	0.36
<i>N. cornutus</i>	-	0.77	0.13	+	-	-	-	-	-	-	0.31
<i>N. hudsonius</i>	-	24.35	6.93	2.2	-	-	-	0.66	0.17	+	0.34
<i>N. spilopterus</i>	-	53.05	10.50	3.4	7.32	5.5	0.37	42.52	11.75	6.9	6.89
<i>N. volucellus</i>	-	7.12	1.19	0.4	23.07	17.4	-	3.89	1.14	0.7	0.68
<i>Catostomus commersoni</i>	-	0.26	0.16	+	-	-	-	-	-	-	-
<i>Ictalurus punctatus</i>	-	1.41	0.35	0.3	0.25	0.2	-	0.36	0.09	+	-
<i>Ambloplites rupestris</i>	-	0.44	0.07	+	0.25	0.2	-	-	-	-	-
<i>Lepomis gibbosus</i>	-	0.24	0.06	+	-	-	-	-	-	-	-
<i>L. macrochirus</i>	-	0.25	0.04	+	5.34	3.9	-	0.38	0.19	0.1	0.36
<i>L. gibbosus/L. macrochirus</i>	-	1.69	0.28	+	2.42	1.8	-	0.32	0.15	+	-
<i>Micropterus dolomieu</i>	-	0.26	0.08	+	0.22	0.2	-	-	-	-	-
<i>Etheostoma olivaceum</i>	-	0.23	0.04	+	-	-	-	3.75	1.41	0.8	0.33
<i>E. zonale</i>	-	3.52	0.63	0.2	0.24	0.2	-	1.90	0.81	0.5	-
<i>Percina peltata</i>	-	1.71	0.33	0.1	-	-	-	2.39	0.78	0.5	-
Total Young	2.26	62.52	21.34	6.9	38.93	29.7	4.71	49.70	16.62	9.8	9.26
TOTAL	133.17	365.76	310.36		132.96		61.70	213.60	170.62		63.47

+ Less than 0.1%.

Table 4.2-31

Results of the four factor analysis of variance test performed on total ichthyoplankton densities taken by 0.5 m net during entrainment studies at the IMINS Unit 1 Intake, May through August 1977 through 1982.

Factors	Density	F_{cal}/F_{crit}
Year	*	17.40
Date	*	11.83
Depth	*	8.06
Time	*	5.23
Year X Date	*	22.79
Year X Depth	*	3.57
Year X Time	*	2.13
Date X Depth	*	2.21
Date X Time	*	1.88
Depth X Time	NS	0.31
Year X Date X Depth	*	2.84
Year X Date X Time	*	2.59
Year X Depth X Time	*	1.07
Date X Depth X Time	NS	0.98
Year X Date X Depth X Time	*	1.74

NS Not Significant.

* Significant at $P \leq 0.05$.

Table 4.2-33

Results of the four factor analysis of variance test performed on total ichthyoplankton densities taken by 0.5 m net during entrainment studies at the IMINS Unit 1 and 2 Intakes, 11 May through 25 August 1982. Replicates were not significant and were combined for analysis.

Factors	Density			
	Unit 1	F_{cal}/F_{crit}	Unit 2	F_{cal}/F_{crit}
Date	*	13.74	*	11.83
Depth	*	3.89	*	1.47
Time	*	5.16	*	4.60
Date X Depth	*	6.35	NS	0.83
Date X Time	*	4.35	*	4.94
Depth X Time	*	1.27	*	1.39
Date X Depth X Time	*	2.09	*	1.18

NS Not Significant.

* Significant at $P \leq 0.05$.

Table 4.2-32

Results of the four factor analysis of variance test performed on total ichthyoplankton densities taken by 0.5 m net during entrainment studies at the IMINS Unit 2 Intake, May through August 1978 through 1982.

Factors	Density	F_{cal}/F_{crit}
Year	*	15.37
Date	*	22.42
Depth	*	4.96
Time	*	2.10
Year X Date	*	20.43
Year X Depth	*	4.76
Year X Time	*	5.43
Date X Depth	*	2.26
Date X Time	*	4.26
Depth X Time	*	2.03
Year X Date X Depth	*	2.41
Year X Date X Time	*	5.24
Year X Depth X Time	*	2.77
Date X Depth X Time	*	1.52
Year X Date X Depth X Time	*	2.54

* Significant at $P \leq 0.05$.

Table 4.2-34

Results of the five factor analysis of variance test performed on total ichthyoplankton densities taken by 0.5 m net during entrainment studies at the IMINS Unit 1 and 2 Intakes, 11 May through 25 August 1982. Replicates were not significant and were combined for analysis.

Factors	Density	F_{cal}/F_{crit}	
		Unit 1	Unit 2
Unit			12.92
Date	*		19.79
Depth	*		5.39
Time	*		8.29
Unit X Date	*		8.07
Unit X Depth	*		1.71
Unit X Time	*		2.13
Date X Depth	*		5.70
Date X Time	*		5.05
Depth X Time	*		1.38
Unit X Date X Depth	*		5.52
Unit X Date X Time	*		4.35
Unit X Depth X Time	*		1.27
Date X Depth X Time	*		2.45
Unit X Date X Date X Time	*		1.63

* Significant at $P \leq 0.05$.

Table 4.2-35

Results of the Student-Newman-Keuls multirange test performed on the mean densities of total ichthyoplankton taken by 0.5 m net during entrainment studies at the TMDS Unit 1 intake, May through August 1977 through 1982. Sample years, dates, and times underscored showed no significant differences ($P \leq 0.05$). Years, dates, and times are ranked from lowest to highest mean density. Semimonthly sample dates are designated by a 1 or 2.

	Sample Period								Time (h)				Year					
	Aug	Jun	May	May	Aug	Jul	Jun	Jul	1600	2200	0400	1000	1977	1982	1979	1980	1978	1981
Total Ichthyoplankton	1	2	1	2	1	1	1	2										

Table 4.2-36

Results of the Student-Newman-Keuls multirange test performed on the mean densities of total ichthyoplankton taken by 0.5 m net during entrainment studies at the TMDS Unit 2 intake, May through August 1978 through 1982. Sample years, dates, and times underscored showed no significant differences ($P \leq 0.05$). Years, dates, and times are ranked from lowest to highest mean density. Semimonthly sample dates are designated by a 1 or 2.

	Sample Period								Time (h)				Year					
	Aug	Jun	Jul	Jul	May	Aug	May	Jun	1600	0400	1000		1979	1982	1978	1981	1980	
Total Ichthyoplankton	2	2	1	2	1	1	2	1										

Table 4.2-37

Results of the Student-Newman-Keuls multirange test performed on the mean densities of total ichthyoplankton taken by 0.5 m net during entrainment studies at the TMDS Unit 1 and 2 intakes, 1982. Sample dates and times underscored showed no significant differences ($P \leq 0.05$). Dates and times are ranked from lowest to highest mean density.

	Sample Date								Time (h)			
	Jun	Jul	Jun	Aug	May	Jul	May	Aug	1600	1000	2200	0400
Total Ichthyoplankton (Unit 1)	15-16	6-7	22-23	26-25	25-26	20-21	11-12	10-11				
Total Ichthyoplankton (Unit 2)	15-16	22-23	6-7	26-25	20-21	10-11	25-26	11-12	1000	1600	2200	0400
Total Ichthyoplankton (Units 1 and 2)	15-16	6-7	22-23	26-25	20-21	25-26	10-11	11-12	1600	1000	2200	0400

Table 4.2-38

Summary of mean density (n/100 m³) and percent composition (%) of ichthyoplankton taken by 0.5 m net at 1000, 1600, 2200, and 0400 h in surface and oblique tows during entrainment studies at TMINS Unit 1, 11 May through 25 August 1982.

	SURFACE					OBLIQUE				
	1000 n/100 m ³ %	1600 n/100 m ³ %	2200 n/100 m ³ %	0400 n/100 m ³ %	Mean n/100 m ³ %	1000 n/100 m ³ %	1600 n/100 m ³ %	2200 n/100 m ³ %	0400 n/100 m ³ %	Mean n/100 m ³ %
LARVAE										
<i>Notropis aeneus</i>	-	-	-	1.84 0.8	-	-	-	2.02 2.1	-	0.30 0.5
<i>Cyprinus carpio</i>	1.67 1.4	-	-	-	3.97 1.5	-	1.79 2.5	3.63 3.8	-	1.35 1.4
<i>Notropis anogenus</i>	-	-	-	-	4.03 1.5	-	-	-	-	-
<i>N. hudsonius</i>	8.22 6.0	11.84 24.9	29.21 13.5	70.51 25.9	29.92 11	8.36 12.3	23.40 33.1	21.90 22.6	36.98 23.8	21.66 23.2
<i>N. spilopterus</i>	5.69 4.2	-	-	5.63 2.6	30.28 11.1	10.40 15.2	1.79 2.6	9.85 13.9	9.72 10.1	16.98 10.9
<i>N. volucellus</i>	5.63 4.1	4.03 3.5	19.12 8.8	15.23 5.6	11.00 6.5	-	-	-	4.03 4.2	8.59 5.5
<i>Cariacus cyprinus</i>	-	-	-	9.41 4.4	3.7	4.86 2.9	3.85 5.6	1.79 2.5	3.63 3.8	9.82 6.3
<i>Catostomus commersoni</i>	3.92 2.9	1.89 4.0	-	-	-	-	-	3.60 5.1	1.95 2.0	4.33 2.8
<i>Ambloplites rupestris</i>	-	-	-	-	0.7	0.50 0.3	-	-	-	1.69 1.1
<i>Lepomis gibbosus/L. macrochirus</i>	6.07 49.0	3.97 8.4	9.85 4.1	1.1	24.40 14.5	12.71 18.6	3.47 4.1	13.53 16.0	15.51 10.0	11.30 11.6
<i>Etheostoma olivaceum</i>	-	-	-	-	1.7	0.50 0.3	-	-	-	-
<i>E. zonale</i>	6.12 4.5	3.97 8.4	3.68 1.7	4.4	6.47 3.6	23.59 34.6	6.67 9.4	9.00 9.3	48.60 31.3	21.96 22.5
<i>Percina peltata</i>	8.62 6.3	3.91 8.2	-	-	16.64 6.1	7.29 4.3	15.91 23.3	10.27 14.6	1.74 1.8	8.54 5.5
<i>Unidentified</i>	-	1.95 4.1	-	-	-	0.49 0.3	-	-	-	-
Total Larvae	107.15 78.3	31.57 66.4	78.73 36.4	183.52 67.4	100.25 59.6	68.22 100.0	60.85 86.1	71.15 73.6	151.06 97.3	47.87 49.9
YOUNG										
<i>Notropis spilopterus</i>	1.84 1.3	5.99 12.6	17.40 8.0	29.49 10.8	13.68 8.1	-	2.02 2.9	1.84 1.9	-	0.96 1.0
<i>E. volucellus</i>	12.54 9.7	6.05 2.7	194.83 42.5	55.25 20.3	44.67 26.6	-	-	4.03 4.2	1.89 1.2	1.08 1.5
<i>Ictalurus punctatus</i>	-	-	-	-	-	-	-	-	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	-	-	-	2.02 2.1	-	0.50 0.5
<i>Lepomis macrochirus</i>	9.54 7.0	1.95 4.1	15.33 7.1	3.97 1.5	7.70 4.6	-	2.02 2.9	6.12 6.3	2.23 1.4	2.39 2.7
<i>L. gibbosus/L. macrochirus</i>	5.74 4.2	1.95 4.1	-	-	1.92 1.1	-	4.03 5.7	7.60 7.9	-	2.91 3.0
<i>Micropterus dolomieu</i>	-	-	-	-	-	-	1.79 2.5	-	-	0.45 0.5
<i>Etheostoma zonale</i>	-	-	-	-	-	-	-	1.95 2.0	-	0.49 0.5
Total Young	29.66 21.7	15.95 32.6	137.35 62.6	88.71 32.6	67.97 40.4	-	8.80 13.9	25.57 26.4	4.13 2.7	8.89 10.1
TOTAL	136.81	47.51	216.29	272.24	168.21	68.22	70.70	96.72	155.16	57.70

Table 4.2-39

Summary of mean density (n/100 m³) and percent composition (%) of ichthyoplankton taken by 0.5 m net at 1000, 1600, 2200, and 0400 h in surface and oblique tows during entrainment studies at TMINS Unit 2, 11 May through 25 August 1982.

	SURFACE					OBLIQUE				
	1000 n/100 m ³ %	1600 n/100 m ³ %	2200 n/100 m ³ %	0400 n/100 m ³ %	Mean n/100 m ³ %	1000 n/100 m ³ %	1600 n/100 m ³ %	2200 n/100 m ³ %	0400 n/100 m ³ %	Mean n/100 m ³ %
LARVAE										
<i>Cyprinus carpio</i>	-	-	-	-	-	-	2.50 6.3	-	-	0.63 1.2
<i>Notropis anogenus</i>	-	2.72 3.9	2.72 3.9	-	2.04 2.8	-	-	-	-	-
<i>N. hudsonius</i>	5.95 25.8	27.53 39.4	23.44 33.4	8.41 6.5	16.37 22.3	5.82 14.6	5.68 14.3	41.90 66.2	19.17 26.5	18.14 33.7
<i>N. spilopterus</i>	5.82 25.2	-	21.65 30.8	21.69 16.7	12.29 16.8	-	2.50 6.3	10.59 16.7	5.21 7.2	4.57 8.5
<i>N. volucellus</i>	-	-	-	2.84 2.2	0.71 1.0	-	-	-	-	-
<i>Cariacus cyprinus</i>	-	-	5.69 8.1	2.98 2.3	2.17 3.0	-	2.60 6.6	-	15.96 22.1	4.64 8.6
<i>Catostomus commersoni</i>	-	-	2.98 4.2	2.72 2.1	1.42 1.9	-	-	-	-	-
<i>Lepomis gibbosus/L. macrochirus</i>	-	-	5.21 7.4	5.10 3.9	2.58 3.5	-	2.60 6.6	5.21 8.2	7.81 10.8	3.91 7.3
<i>Etheostoma olivaceum</i>	-	-	-	-	-	-	-	2.84 4.5	-	0.71 1.3
<i>E. zonale</i>	5.95 25.8	16.69 23.9	-	71.69 55.4	23.58 32.9	17.74 44.6	8.29 20.9	-	24.12 33.4	12.53 23.3
<i>Percina peltata</i>	-	-	-	5.69 4.4	1.42 1.9	2.98 7.5	-	-	-	0.74 1.4
Total Larvae	17.72 76.8	46.93 67.1	61.68 87.9	123.83 92.6	62.54 85.5	26.53 66.7	24.18 60.9	60.53 95.7	72.27 100.0	45.80 85.3
YOUNG										
<i>Notropis anogenus</i>	-	-	-	2.84 2.2	0.71 1.0	-	-	-	-	-
<i>N. cornutus</i>	-	-	-	-	-	-	2.50 6.3	-	-	0.63 1.2
<i>N. hudsonius</i>	-	-	-	-	-	2.72 6.8	-	-	-	0.68 1.3
<i>N. spilopterus</i>	5.34 23.1	20.30 29.0	8.52 12.1	2.84 2.2	9.25 12.6	7.71 19.4	7.72 19.4	2.72 4.3	-	4.54 8.4
<i>N. volucellus</i>	-	2.72 3.9	-	-	0.68 0.9	-	2.72 6.8	-	-	0.68 1.3
<i>Lepomis macrochirus</i>	-	-	-	-	-	2.84 7.1	-	-	-	0.71 1.3
<i>Etheostoma olivaceum</i>	-	-	-	-	-	-	2.60 6.5	-	-	0.65 1.0
Total Young	5.34 23.2	23.02 32.9	8.52 12.1	5.68 4.4	10.64 14.5	13.27 33.3	15.74 39.1	2.72 4.3	-	7.88 14.7
TOTAL	23.06	69.96	70.20	129.51	73.18	39.80	39.72	63.25	72.27	53.79

Table 4.2-40

Indices of percent similarity of species composition between 1000, 1600, 2200, and 0400 h and surface and oblique tows for entrainment studies at THINS Units 1 and 2, May through August 1982.

Unit 1																					
OBLIQUE																					
				0400	1600	2200	1000					0400	1600	2200	1000						
71.6				60.5	62.5	51.2	63.6					76.2	65.7	42.9	79.4						
66.3	66.3			45.9	49.8	47.8	42.0					53.6	58.6	42.8	55.7						
68.7	50.7	54.9		52.0	59.3	64.0	45.4					62.2	52.1	58.1	56.4						
				40.7	38.8	27.9	54.3					64.1	51.0	26.1	64.7						
SURFACE																					
63.3	62.7	64.8	37.4									58.4	59.9	55.2	48.8						
48.3	50.5	40.0	32.7	63.0								32.9	43.6	32.3	37.6						
69.5	71.8	71.6	48.1	76.8	58.7							57.0	48.7	45.7	51.3						
42.4	57.8	40.1	38.0	44.3	38.2	55.1						29.4	30.8	19.7	26.8						
Unit 1	OBLIQUE	0400	2200	1600	1000	SURFACE	0400	2200	1600	1000	1000	1600	2200	0400	SURFACE	1000	1600	2200	0400	OBLIQUE	Unit 2
											1000	1600	2200	0400	SURFACE	1000	1600	2200	0400	OBLIQUE	Unit 2
												78.7	68.7	51.2		66.6	60.9	46.8	58.8		
													66.3	55.4		64.7	64.8	60.4	57.6		
														37.6		47.9	53.2	61.8	49.2		
																78.3	54.7	29.3	51.3		
SURFACE																					
OBLIQUE																					
Unit 2																					

Table 4.2-41

Summary of numbers (n) and percent composition (Σ) of ichthyoplankton taken in Transect TM-LF-13A3 and at TMINS Units 1 and 2 in 1982. Surface and oblique samples were combined for TMINS.

Stations	Transect TM-LF-13A3						TMINS			
	13A1		13A4		13A2		Unit 1		Unit 2	
	n	Σ	n	Σ	n	Σ	n	Σ	n	Σ
<i>Dorosoma cepedianum</i>	-	-	-	-	2	0.6	2	0.4	1	0.5
<i>Cyprinus carpio</i>	2	2.4	3	2.1	22	7.0	6	1.1	-	-
<i>Notropis anogenus</i>	-	-	-	-	-	-	2	0.4	4	2.2
<i>N. cornutus</i>	-	-	-	-	-	-	-	-	1	0.5
<i>N. hudsonius</i>	3	5.9	9	6.2	109	34.8	106	19.3	4	26.4
<i>N. spilopterus</i>	8	9.4	24	17.8	26	8.3	72	13.1	45	24.7
<i>N. volucellus</i>	-	-	3	2.1	2	0.6	124	22.6	3	1.6
<i>Ceriodon cyprinus</i>	45	52.9	54	35.6	75	24.0	20	3.6	10	5.5
<i>Leiostomus xanthurus</i>	-	-	1	0.7	-	-	8	1.5	2	1.1
<i>H. macrolepidotum</i>	1	1.2	1	0.7	-	-	-	-	-	-
<i>Ictalurus punctatus</i>	1	1.2	20	15.1	-	-	1	0.2	-	-
<i>Ambloplites rupestris</i>	-	-	-	-	2	0.6	3	0.5	-	-
<i>Lepomis auritus</i>	3	3.5	-	-	1	0.3	-	-	-	-
<i>L. macrochirus</i>	-	-	-	-	-	-	21	3.8	1	0.5
<i>L. gibbosus/L. macrochirus</i>	3	3.5	1	0.7	34	10.9	87	15.9	10	5.5
<i>Micropterus dolomieu</i>	1	1.2	-	-	-	-	1	0.2	-	-
<i>Pomoxis nigromaculatus</i>	1	1.2	-	-	-	-	-	-	-	-
<i>H. ostoma olmstedii</i>	9	10.6	5	3.4	8	2.6	2	0.4	2	1.1
<i>E. zonale</i>	6	7.1	22	15.1	28	8.9	60	10.9	52	28.6
<i>Percina peltata</i>	-	-	1	0.7	3	1.0	32	5.8	3	1.6
<i>Stizostedion vitreum vitreum</i>	-	-	-	-	1	0.3	-	-	-	-
Unidentified	-	-	-	-	-	-	1	0.2	-	-
TOTAL	85		146		313		548		182	

Table 4.2-42

Indices of percent similarity of species composition between push net stations in Transect TM-LF-13A3 and entrainment collections at TMINS Units 1 and 2 in 1982.

Stations	Transect TM-LF-13A3			TMINS	
	13A1	13A4	13A2	Unit 1	Unit 2
13A1					
13A4	66.0				
13A2	54.1	54.1			
Unit 1	31.4	39.7	55.1		
Unit 2	32.6	49.4	58.0	58.6	

Table 4.2-43

Estimated number of ichthyoplankton entrained by TMINS Units 1 and 2 during the 1000, 1600, 2200, and 0400 h sample periods, 11 May through 25 August 1982.

	May 11-12	May 25-26	Jun 15-16	Jun 22-23	Jul 6-7	Jul 20-21	Aug 10-11	Aug 24-25
				UNIT 1				
1000	37963	34397	2579	2655	-	20937	-	-
1600	52775	8131	2579	2579	7579	10172	23295	-
2200	28836	46211	2021	2655	-	20051	50359	1318
0400	85568	122680	-	8833	12036	75710	8050	6233
TOTAL	205142	211418	7979	16722	14615	126870	81704	12251
				UNIT 2				
1000	40718	23321	7435	-	8550	-	2775	21992
1600	15547	7773	7126	7126	7773	14252	35393	13681
2200	98724	20502	-	8144	-	20829	15547	14276
0400	23321	154025	-	14871	-	42754	-	-
TOTAL	178310	205621	14561	30141	16324	77835	58713	49049

Table 4.2-44

Estimated number of ichthyoplankton entrained by TMINS Units 1 and 2, May through August 1982.

Actual Sample Period	May 11-12	May 25-26	Jun 15-16	Jun 22-23	Jul 6-7	Jul 20-21	Aug 10-11	Aug 24-25	TOTAL
Expanded Sample Period	May - May 5 18	May - Jun 19 5	Jun - Jun 6 18	Jun - Jun 19 29	Jun - Jul 30 13	Jul - Jul 14 31	Jul - Aug 17	Aug - Aug 18 31	
UNIT 1	2872091	3805540	103730	183942	248457	2283675	1378983	171513	11057841
UNIT 2	2496344	3701181	189297	335547	277516	1401032	998137	686699	10081753
TOTAL	5368345	7506721	293027	515489	525973	3684707	2387120	858212	21139594

Table 4. 5-65
Number (n) and density (n/100 m³) of Ichthyoplankton taken at Station 19-18-15A to York River Pond during the day, 11 May through 22 August 1995.

Date	11 May	15 May	15 Jun	22 Jun
River Flow (m ³ /sec)	493	526	1897	1096
Flow	0958	1057	1022	1106
Current Velocity (cm/sec)	40	40	66	46
Air Temp (C)	16.5	22.5	20.5	23.8
Water Temp (C)	16.2	17.5	17.5	20.0
Dissolved Oxygen (mg/l)	9.2	9.2	9.0	8.3
pH	8.9	8.9	7.9	8.0
Secchi Disc (cm)	97	25	30	10
Replicate	34.8	31.8	32.3	32.2
Volume Sampled (m ³)	7.87	9.43	17.40	6.70
Density (n/100 m ³)	6.31	7.96	18.64	6.71
Mean Density	n n/100 m ³	n n/100 m ³	n n/100 m ³	n n/100 m ³
LABYR	-	-	-	-
<i>Notonecta badius</i> n	-	-	-	1
<i>E. not. uperna</i> n	-	-	-	1
<i>Caridopsis serrata</i> n	2	3	1	2
<i>Etheostoma olivaceum</i> n	-	-	-	1
<i>E. zonale</i> n	-	-	-	5
<i>Percilia nigricans</i> n	-	-	-	1
Total Larvae n	2	3	1	8
YOON	-	-	-	-
<i>Notonecta melanellus</i> n	-	-	-	-
Total YOON n	-	-	-	-
TOTAL	1	3	1	2

Table 4. 5-65 continued.

Date	6 Jul	20 Jul	10 Aug	26 Aug
River Flow (m ³ /sec)	759	1306	261	151
Flow	1142	1014	0950	1022
Current Velocity (cm/sec)	47	35	35	27
Air Temp (C)	25.0	26.0	24.5	24.0
Water Temp (C)	21.5	28.5	24.0	20.2
Dissolved Oxygen (mg/l)	7.6	7.0	6.1	9.1
pH	7.8	8.9	8.4	9.2
Secchi Disc (cm)	15	84	20	38
Replicate	31.4	30.8	30.5	35.3
Volume Sampled (m ³)	3.19	3.24	6.53	6.55
Density (n/100 m ³)	3.22	3.22	6.56	6.56
Mean Density	n n/100 m ³	n n/100 m ³	n n/100 m ³	n n/100 m ³
LABYR	-	-	-	-
<i>Notonecta badius</i> n	-	-	-	-
<i>E. not. uperna</i> n	-	-	-	-
<i>Caridopsis serrata</i> n	1	1	2	2
<i>Etheostoma olivaceum</i> n	-	-	-	-
<i>E. zonale</i> n	-	-	-	-
<i>Percilia nigricans</i> n	1	1	1	1
Total Larvae n	1	1	2	2
YOON	-	-	-	-
<i>Notonecta melanellus</i> n	-	-	-	-
Total YOON n	-	-	-	-
TOTAL	1	1	2	2

Table 4.2-46

Number (n) and density (n/100 m³) of ichthyoplankton taken at Station 79-12-73A, in York Haven Pond at night, 11 May through 24 August 1982.

Date	11 May		25 May		15 Jun		22 Jun	
River Flow (m ³ /sec)	493		524		1897		1096	
Time	2153		2324		2325		2324	
Current Velocity (cm/sec)	30		53		35		43	
Air Temp (C)	16.5		16.0		22.0		16.3	
Water Temp (C)	18.8		17.5		18.5		20.5	
Dissolved Oxygen (mg/l)	11.0		10.2		9.5		8.0	
pH	9.3		8.2		8.1		8.5	
Replicate	a	b	a	b	a	b	a	b
Volume Sampled (m ³)	30.9	32.9	41.9	36.9	32.6	32.8	30.9	35.6
Density (n/100 m ³)	35.65	26.29	42.96	32.69	21.62	9.21	11.16	14.13
Mean Density	29.97		32.73		15.34		12.66	
	n	n/100 m ³	n	n/100 m ³	n	n/100 m ³	n	n/100 m ³
LARVAE	-	-	1	2.39	-	-	-	-
<i>Cyprinus carpio</i>	-	-	-	-	-	-	-	-
<i>Notropis heterodon</i>	4	12.95	1	3.04	-	-	1	2.79
<i>H. aplocheirus</i>	-	-	-	-	-	-	-	-
<i>H. ocellatus</i>	-	-	-	-	-	-	-	-
<i>Lepomis cyprinus</i>	1	3.24	3	9.11	12	28.63	3	9.21
<i>Lepisosteus osseus</i>	-	-	-	-	1	2.71	-	-
<i>Moxostoma valenciennianum</i>	-	-	1	3.04	-	-	-	-
<i>Lepomis gibbosus</i> /L. macrochirus	2	6.47	1	3.04	1	2.39	-	-
<i>Scheuchzeria palustris</i>	4	12.95	2	6.07	2	4.77	-	-
<i>L. sunale</i>	11	35.65	8	26.29	16	47.96	12	32.69
Total Larvae	11	35.65	8	26.29	16	47.96	12	32.69
YOUNG	-	-	-	-	-	-	-	-
<i>Lepomis punctatus</i>	-	-	-	-	-	-	-	-
Total Young	-	-	-	-	-	-	-	-
TOTAL	11	35.65	8	26.29	16	47.96	12	32.69

Table 4.2-46 continued.

Date	5 Jul		20 Jul		10 Aug		24 Aug	
River Flow (m ³ /sec)	759		306		261		151	
Time	2256		2215		2153		2136	
Current Velocity (cm/sec)	52		30		30		15	
Air Temp (C)	23.5		25.0		23.0		23.0	
Water Temp (C)	22.5		28.0		26.0		26.0	
Dissolved Oxygen (mg/l)	8.1		9.2		10.1		11.2	
pH	8.0		9.2		9.2		9.6	
Replicate	a	b	a	b	a	b	a	b
Volume Sampled (m ³)	32.9	32.6	34.5	33.8	33.8	33.8	39.5	39.6
Density (n/100 m ³)	9.12	7.63	28.95	53.23	35.53	20.72	-	-
Mean Density	7.63		41.09		28.13		-	
	n	n/100 m ³	n	n/100 m ³	n	n/100 m ³	n	n/100 m ³
LARVAE	-	-	-	-	-	-	-	-
<i>Cyprinus carpio</i>	1	3.04	-	-	-	-	-	-
<i>Notropis heterodon</i>	-	-	-	-	-	-	-	-
<i>H. aplocheirus</i>	-	-	-	-	3	8.87	7	20.72
<i>H. ocellatus</i>	-	-	-	-	-	-	-	-
<i>Lepomis cyprinus</i>	-	-	1	2.89	1	2.96	-	-
<i>Lepisosteus osseus</i>	-	-	-	-	-	-	-	-
<i>Lepisosteus valenciennianum</i>	-	-	-	-	-	-	-	-
<i>Moxostoma valenciennianum</i>	-	-	-	-	-	-	-	-
<i>Lepomis gibbosus</i> /L. macrochirus	-	-	-	-	1	2.96	-	-
<i>Scheuchzeria palustris</i>	-	-	-	-	-	-	-	-
<i>L. sunale</i>	2	6.08	1	3.07	-	-	-	-
Total Larvae	3	9.12	1	3.07	2	5.79	7	20.72
YOUNG	-	-	-	-	-	-	-	-
<i>Lepomis punctatus</i>	-	-	1	3.07	8	23.16	13	38.65
Total Young	-	-	1	3.07	8	23.16	13	38.65
TOTAL	3	9.12	1	3.07	10	28.95	20	59.37

Table 4.2-47

Estimate of the percentage of ichthyoplankton drifting through Traject TM-1F-13A3 during the day which were entrained by TMINS Units 1 and 2, 11 May through 24 August 1982.

RIVER	Date	Time (h)	Zone I		Zone II		Zone III		Zone IV	
			N _I	F _I	N _{II}	F _{II}	N _{III}	F _{III}	N _{IV}	F _{IV}
11 May	1007-1015		1.45	30.58	2.88	40.78	4.49	41.23	4.67	20.84
25 May	1043-1139		5.37	34.47	6.66	45.96	6.98	46.47	6.01	23.49
15 Jun	0926-1030		12.88	105.90	15.76	141.20	11.85	142.77	5.05	72.17
22 Jun	1125-1145		7.55	60.92	6.13	81.23	5.27	82.13	5.82	41.55
6 Jul	1139-1209		1.45	43.34	2.34	57.79	2.31	58.43	1.39	17.8
20 Jul	1125-1132		14.00	17.66	7.00	23.55	-	23.81	-	12.04
10 Aug	1007-1102		10.61	15.37	8.58	20.50	2.37	20.73	-	10.48
24 Aug	1013-1031		-	8.73	-	11.64	-	11.77	-	5.95
UNIT 1 INTAKE			N ₁	F ₁	% of Ichthyoplankton Entrained					
11 May	1022-1620		251.75	0.50	Center Channel	28.42	Zone I	*		
25 May	1012-1600		117.31	0.50	Center Channel	6.15	Zone I	31.69		
15 Jun	1021-1555		14.27	0.50	Center Channel	0.13	Zone I	0.52		
22 Jun	1111-1614		14.54	0.50	Center Channel	0.45	Zone I	1.58		
6 Jul	1010-1623		7.11	0.50	Center Channel	0.95	Zone I	5.66		
20 Jul	1028-1633		85.50	0.50	Center Channel	10.40	Zone I	17.29		
10 Aug	1141-1602		65.48	0.50	Center Channel	8.07	Zone I	20.08		
24 Aug	1008-1559		-	0.50	Center Channel	-	Zone I	-		
UNIT 2 INTAKE			N ₁₁	F ₁₁	% of Ichthyoplankton Entrained					
11 May	1112-1645		82.77	0.95	Center Channel	17.70	Zone I	*		
25 May	1057-1627		45.73	0.95	Center Channel	4.54	Zone I	23.47		
15 Jun	1102-1620		21.21	0.95	Center Channel	0.36	Zone I	1.48		
22 Jun	1158-1638		10.45	0.95	Center Channel	0.61	Zone I	2.16		
6 Jul	1058-1638		24.08	0.95	Center Channel	6.13	Zone I	36.40		
20 Jul	1104-1648		20.57	0.95	Center Channel	4.74	Zone I	7.90		
10 Aug	1112-1627		63.67	0.95	Center Channel	14.87	Zone I	37.09		
24 Aug	1045-1628		50.70	0.95	Center Channel	*	Zone I	*		

N_I Mean density (n/100 m³) of ichthyoplankton in Zone I.

F_I Flow rate in Zone I (100 m³/min).

N_{II} Mean density (n/100 m³) of ichthyoplankton in Zone II.

F_{II} Flow rate in Zone II (100 m³/min).

N_{III} Mean density (n/100 m³) of ichthyoplankton in Zone III.

F_{III} Flow rate in Zone III (100 m³/min).

N_{IV} Mean density (n/100 m³) of ichthyoplankton in Zone IV.

F_{IV} Flow rate in Zone IV (100 m³/min).

N₁ Mean density (n/100 m³) of ichthyoplankton in the TMINS Unit 1 Intake pump suction bay.

F₁ Flow rate into Unit 1 Intake (100 m³/min).

N₁₁ Mean density (n/100 m³) of ichthyoplankton in the TMINS Unit 2 Intake pump suction bay.

F₁₁ Flow rate into Unit 2 Intake (100 m³/min).

* Numbers taken in river samples were too low for computation of percent entrainment estimate, since computation would result in estimates >100%.

Table 4.2-48

Estimate of the percentage of ichthyoplankton drifting through Transect TM-LF-13A3 at night which were entrained by TMINS Units 1 and 2, 11 May through 25 August 1982.

RIVER Date	Time (h)	Zone I		Zone II		Zone III		Zone IV	
		N _I	F _I	N _{II}	F _{II}	N _{III}	F _{III}	N _{IV}	F _{IV}
11 May	2112-2202	154.27	32.87	92.12	43.88	24.46	44.32	18.94	22.40
25 May	2221-2305	91.04	42.89	64.38	57.19	34.24	57.83	30.76	29.23
15 Jun	2132-2217	31.16	97.64	23.25	130.19	15.32	131.64	15.29	66.54
22 Jun	2318-2331	52.36	56.51	32.50	75.34	13.85	76.18	15.06	38.51
6 Jul	2305-2326	16.93	41.55	12.28	55.93	5.26	56.56	2.88	28.59
20 Jul	2319-2327	32.42	17.83	36.76	23.77	24.50	24.03	7.90	12.15
10 Aug	2109-2202	20.07	16.58	24.10	22.11	18.61	22.36	9.09	11.30
24 Aug	2129-2144	3.01	8.29	1.51	11.06	0.76	11.18	1.52	5.65
UNIT 1 INTAKE		N ₁		F ₁		% of Ichthyoplankton Entrained			
						Center Channel	Zone I		
11-12 May	2223-0508	319.85		0.50		1.51	3.15		
25-26 May	2243-0450	235.75		0.95		2.14	5.74		
15-16 Jun	2214-0410	7.79		0.50		0.04	0.13		
22-23 Jun	2228-0416	31.65		0.50		0.23	0.53		
6-7 Jul	2216-0407	33.54		0.50		0.95	2.36		
20-21 Jul	2225-0428	187.09		0.63		5.70	21.04		
10-11 Aug	2212-0415	162.16		0.50		5.87	24.37		
24-25 Aug	2206-0437	34.00		0.50		29.05	68.13		
UNIT 2 INTAKE		N _{II}		F _{II}		% of Ichthyoplankton Entrained			
						Center Channel	Zone I		
11-12 May	2243-0435	177.63		0.95		1.59	3.33		
25-26 May	2209-0416	191.95		1.25		2.30	6.14		
15-16 Jun	2250-0435	-		0.80		-	-		
22-23 Jun	2250-0452	33.38		0.80		0.45	1.07		
6-7 Jul	2231-0432	-		0.95		-	-		
20-21 Jul	2242-0507	92.37		0.95		4.11	15.18		
10-11 Aug	2230-0458	22.37		0.95		1.54	6.39		
24-25 Aug	2230-0502	20.89		0.95		33.81	79.53		
N _I	Mean density (n/100 m ³) of ichthyoplankton in Zone I.								
F _I	Flow rate in Zone I (100 m ³ /min).								
N _{II}	Mean density (n/100 m ³) of ichthyoplankton in Zone II.								
F _{II}	Flow rate in Zone II (100 m ³ /min).								
N _{III}	Mean density (n/100 m ³) of ichthyoplankton in Zone III.								
F _{III}	Flow rate in Zone III (100 m ³ /min).								
N _{IV}	Mean density (n/100 m ³) of ichthyoplankton in Zone IV.								
F _{IV}	Flow rate in Zone IV (100 m ³ /min).								
N ₁	Mean density (n/100 m ³) of ichthyoplankton in the TMINS Unit 1 Intake pump suction bay.								
F ₁	Flow rate into Unit 1 Intake (100 m ³ /min).								
N _{II}	Mean density (n/100 m ³) of ichthyoplankton in the TMINS Unit 2 Intake pump suction bay.								
F _{II}	Flow rate into Unit 2 Intake (100 m ³ /min).								

Table 4.2-49

Number (n/min) of ichthyoplankton drifting through Transect 08-1F-13A3 and estimated number (n/min) and percent (%) entrained at THMS Units 1 and 2, 11-12 May 1982.

	RIVER		UNIT 1				UNIT 2				TOTAL			
	# Drift		# Entrained		% Entrained		# Entrained		% Entrained		# Entrained		% Entrained	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
LARVAE														
<i>Notropis hudsonius</i>	138.11	7212.32	59.85	95.63	43.33	1.33	37.90	158.69	23.82	2.20	92.75	254.32	67.15	3.53
<i>Carpiodes cyprinus</i>	305.86	1266.92	-	-	-	-	-	-	-	-	3.29	8.54	*	*
<i>Cetostoma commersoni</i>	-	-	3.29	8.54	*	*	-	-	-	-	-	-	-	-
<i>Notostoma macrolepidotum</i>	-	67.03	-	-	-	-	-	-	-	-	-	-	-	-
<i>Etheostoma olivaceum</i>	-	1095.34	4.67	-	*	-	-	10.80	-	0.99	4.03	10.80	*	0.99
<i>E. zonale</i>	-	635.61	13.30	33.71	*	5.30	33.93	15.80	*	1.70	47.26	44.30	*	7.00
<i>Percina peltrata</i>	-	258.98	45.15	20.54	*	7.93	11.31	-	-	-	56.46	20.54	*	7.93
<i>Xiphocodion vitreum vitreum</i>	-	86.33	-	-	-	-	-	-	-	-	-	-	-	-
YOUNG														

NO YOUNG TAKEN

* Numbers taken in river samples were too low for computation of percent entrainment estimate.

Table 4.2-50

Number (n/min) of ichthyoplankton drifting through Transect 08-1F-13A3 and estimated number (n/min) and percent (%) entrained at THMS Units 1 and 2, 25-26 May 1982.

	RIVER		UNIT 1				UNIT 2				TOTAL			
	# Drift		# Entrained		% Entrained		# Entrained		% Entrained		# Entrained		% Entrained	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
LARVAE														
<i>Cyprinus carpio</i>	141.11	1747.53	-	13.79	-	0.80	-	-	-	-	-	13.79	-	0.80
<i>Notropis hudsonius</i>	154.25	1438.55	3.68	27.61	2.38	1.91	10.80	41.40	7.00	2.88	14.67	68.84	9.95	4.79
<i>M. spilopterus</i>	-	347.42	-	-	-	-	-	-	-	-	-	-	-	-
<i>Carpiodes cyprinus</i>	506.89	5025.95	4.03	35.54	0.80	0.71	-	29.82	-	1.59	4.03	115.36	0.80	0.30
<i>Cetostoma commersoni</i>	-	77.93	3.91	7.66	*	9.83	-	-	-	-	3.91	7.66	*	9.83
<i>Aethiops americanus</i>	-	86.85	-	-	-	-	-	-	-	-	-	-	-	-
<i>Jenynsia gibbosa</i> /L. M. sushirua	-	260.56	-	-	-	-	-	-	-	-	-	-	-	-
<i>Micropterus dolomieu</i>	-	78.50	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pomoxis nigromaculatus</i>	-	76.75	-	-	-	-	-	-	-	-	-	-	-	-
<i>Etheostoma olivaceum</i>	-	406.04	-	-	-	-	-	-	-	-	-	-	-	-
<i>E. zonale</i>	76.41	952.10	43.60	138.99	57.06	14.60	37.39	120.58	42.39	12.62	75.99	259.57	99.65	27.26
<i>Percina peltrata</i>	-	-	3.68	-	*	-	-	-	-	-	3.68	-	*	-
YOUNG														

NO YOUNG TAKEN

* Numbers taken in river samples were too low for computation of percent entrainment estimate.

Table 4.2-51

Number (n/min) of ichthyoplankton drifting through Transect 08-1F-13A3 and estimated number (n/min) and percent (%) entrained at THMS Units 1 and 2, 15-16 June 1982.

	RIVER		UNIT 1				UNIT 2				TOTAL			
	# Drift		# Entrained		% Entrained		# Entrained		% Entrained		# Entrained		% Entrained	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
LARVAE														
<i>Carpiodes cyprinus</i>	661.85	2493.13	-	-	-	-	-	-	-	-	-	-	-	-
<i>Notostoma macrolepidotum</i>	241.89	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Etheostoma olivaceum</i>	461.96	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>E. zonale</i>	3634.83	1610.38	3.57	-	0.10	-	-	-	-	-	3.57	-	0.10	-
YOUNG														
<i>Notropis hudsonius</i>	-	-	-	-	-	-	10.33	-	*	-	10.33	-	*	-
<i>Micropterus dolomieu</i>	-	-	3.57	-	*	-	-	-	-	-	3.57	-	*	-
<i>Etheostoma olivaceum</i>	-	-	-	-	-	-	9.90	-	*	-	9.90	-	*	-
<i>E. zonale</i>	-	-	-	3.91	-	*	-	-	-	-	-	3.91	-	*

* Numbers taken in river samples were too low for computation of percent entrainment estimate.

Table 4. 2-52
Number (no.) of Ichthyoplankton drifting through transect 79-19-13A3 and percent (%) entrained at 1000 (no.) and percent (%) entrained at 2000 (no.) on 2, 22-23 June 1982.

	8.00H		12.00H		16.00H		20.00H		22.00H		23.00H	
	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift
LARVAE	517.10	1780.21	-	7.71	-	0.43	-	31.96	-	1.80	-	19.57
<i>Botryllus hudsonius</i>	-	125.73	-	-	-	-	-	-	-	-	-	-
<i>B. molluscus</i>	527.28	6992.93	7.25	8.20	1.39	0.16	-	-	1.90	-	17.16	8.20
<i>Sarcocystis curvatus</i>	131.50	166.10	-	-	-	-	-	-	-	-	-	-
<i>Leptocottus armatus</i>	-	-	-	-	-	-	-	-	-	-	-	-

NO. DRIFTING TABLE

Table 4. 2-53
Number (no.) of Ichthyoplankton drifting through transect 79-19-13A3 and estimated number (no.) and percent (%) entrained at 1000 (no.) and percent (%) entrained at 2000 (no.) on 2, 6-7 July 1982.

	8.00H		12.00H		16.00H		20.00H		22.00H		23.00H	
	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift
LARVAE	-	285.47	-	-	-	-	-	-	-	-	-	-
<i>Botryllus hudsonius</i>	175.81	671.76	-	8.33	-	1.24	-	-	-	-	8.33	-
<i>B. molluscus</i>	106.76	653.76	-	8.33	-	1.27	-	21.67	-	22.67	8.33	21.66
<i>Leptocottus armatus</i>	91.69	-	3.57	-	3.85	-	-	-	-	3.57	-	3.85
YOYNG	-	96.83	-	-	-	-	-	-	-	-	-	-
<i>Botryllus hudsonius</i>	-	168.51	-	-	-	-	-	-	-	-	-	-
<i>Leptocottus armatus</i>	-	-	-	-	-	-	-	-	-	-	-	-

Table 4. 2-54
Number (no.) of Ichthyoplankton drifting through transect 79-19-13A3 and estimated number (no.) and percent (%) entrained at 1000 (no.) and percent (%) entrained at 2000 (no.) on 2, 20-21 July 1982.

	8.00H		12.00H		16.00H		20.00H		22.00H		23.00H	
	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift	# Drift	% Drift
LARVAE	43.31	122.05	-	5.26	-	-	-	-	-	-	-	-
<i>Botryllus hudsonius</i>	45.33	122.05	3.57	-	7.89	-	-	-	-	-	3.57	-
<i>B. molluscus</i>	-	357.97	7.16	18.36	4	5.12	28.63	8.08	7.16	67.27	6	13.10
<i>Leptocottus armatus</i>	-	157.62	-	32.83	-	21.86	-	-	-	-	32.83	-
<i>Amphioxus sapidus</i>	45.33	122.05	-	-	-	-	-	-	-	-	-	-
<i>Leptocottus armatus</i>	279.17	762.66	72.36	60.67	16.19	7.96	9.90	69.66	4.36	62.26	110.15	18.53
YOYNG	-	-	-	-	-	-	9.90	-	-	9.90	-	-
<i>Leptocottus armatus</i>	-	736.26	-	-	-	-	-	-	-	-	-	-

* Numbers taken in river samples were too low for computation of percent entrainment estimate.

Table 4.2-55

Number (n/min) of ichthyoplankton drifting through Transect DW-LF-13A3 and estimated number (n/min) and percent (%) entrained at DWNS Units 1 and 2, 10-11 August 1982.

	RIVER		UNIT 1				UNIT 2				TOTAL			
	# Drift		# Entrained		% Entrained		# Entrained		% Entrained		# Entrained		% Entrained	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
LARVAE														
<i>Cyprinus carpio</i>	-	-	-	-	-	-	9.50	-	*	-	9.50	-	*	-
<i>Notropis spilopterus</i>	101.12	885.88	16.13	16.81	15.93	3.03	9.50	21.59	9.50	2.64	25.63	48.60	25.35	5.04
<i>Lepomis gibbosus</i>	-	141.69	-	-	-	-	-	-	-	-	-	-	-	-
<i>L. gibbosus/L. macrochirus</i>	233.53	79.31	-	11.39	-	14.35	-	-	-	-	-	11.39	-	14.35
YOUNG:														
<i>Notropis cornutus</i>	-	-	-	-	-	-	9.50	-	*	-	9.50	-	*	-
<i>N. spilopterus</i>	-	198.14	4.03	3.68	*	1.86	10.33	-	*	-	14.36	3.69	*	1.86
<i>L. gibbosus</i>	14.60	-	-	11.05	-	*	10.33	-	30.75	-	10.33	11.05	30.75	*
<i>Lepomis punctatus</i>	-	-	-	4.03	-	*	-	-	-	-	-	4.03	-	*
<i>Ambloplites rupestris</i>	-	-	-	4.03	-	*	-	-	-	-	-	4.03	-	*
<i>Lepomis macrochirus</i>	-	79.59	4.03	8.06	*	10.13	10.08	-	*	-	14.85	8.06	*	10.13
<i>L. gibbosus/L. macrochirus</i>	38.30	-	8.06	11.03	21.06	*	-	-	-	-	8.06	11.03	21.06	*

* Numbers taken in river samples were too low for computation of percent entrainment estimate.

Table 4.2-56

Number (n/min) of ichthyoplankton drifting through Transect DW-LF-13A3 and estimated number (n/min) and percent (%) entrained at DWNS Units 1 and 2, 24-25 August 1982.

	RIVER		UNIT 1				UNIT 2				TOTAL			
	# Drift		# Entrained		% Entrained		# Entrained		% Entrained		# Entrained		% Entrained	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
LARVAE														
<i>Notropis spilopterus</i>	-	58.75	-	4.17	-	7.09	48.29	9.50	*	16.17	48.29	13.67	*	27.76
YOUNG:														
<i>Notropis spilopterus</i>	-	-	-	-	-	-	10.33	-	*	-	10.33	-	*	-
<i>Lepomis macrochirus</i>	-	-	-	8.63	-	*	-	-	-	-	-	8.63	-	*
<i>L. gibbosus/L. macrochirus</i>	-	-	-	4.17	-	*	-	-	-	-	-	4.17	-	*

* Numbers taken in river samples were too low for computation of percent entrainment estimate.

Table 4.3-1

Yearly indices of entrainment bias for larvae > young of six taxa at DWNS, 1977 through 1982. Night densities at Station DW-LF-13A2 and oblique densities at Units 1 and 2 were used in computations. Sampling at Unit 2 initiated until 1978.

	1977		1978		1979		1980		1981		1982		Mean		Standard Deviation	
	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
<i>Notropis hudsonius</i>	0.13	0.51	0.04	-0.58	-0.12	0.28	-0.81	-0.69	-0.14	-0.26	-0.07	-0.10	-0.22	0.40	0.34	
<i>N. spilopterus</i>	0.64	0.87	0.91	0.73	0.76	0.29	0.30	0.24	0.19	0.70	0.49	0.50	0.53	0.26	0.30	
<i>Carpinus cyprinus</i>	-0.55	-0.60	-0.05	-0.77	-0.69	-0.69	-0.57	-0.81	-0.56	-0.48	-0.50	-0.68	-0.47	0.10	0.25	
<i>Lepomis gibbosus/L. macrochirus*</i>	0.52	0.69	0.20	0.15	-0.11	0.73	0.78	0.78	0.28	0.40	0.07	0.55	0.16	0.24	0.19	
<i>Etheostoma zonale</i>	0.88	0.84	0.83	0.71	0.68	0.01	0.81	0.21	0.49	0.63	0.63	0.55	0.69	0.36	0.14	
<i>Perca saltata</i>	0.93	0.95	0.68	0.86	0.61	0.66	0.82	0.41	0.82	0.77	0.09	0.73	0.65	0.24	0.33	

* Includes young of *L. gibbosus* and *L. macrochirus*.

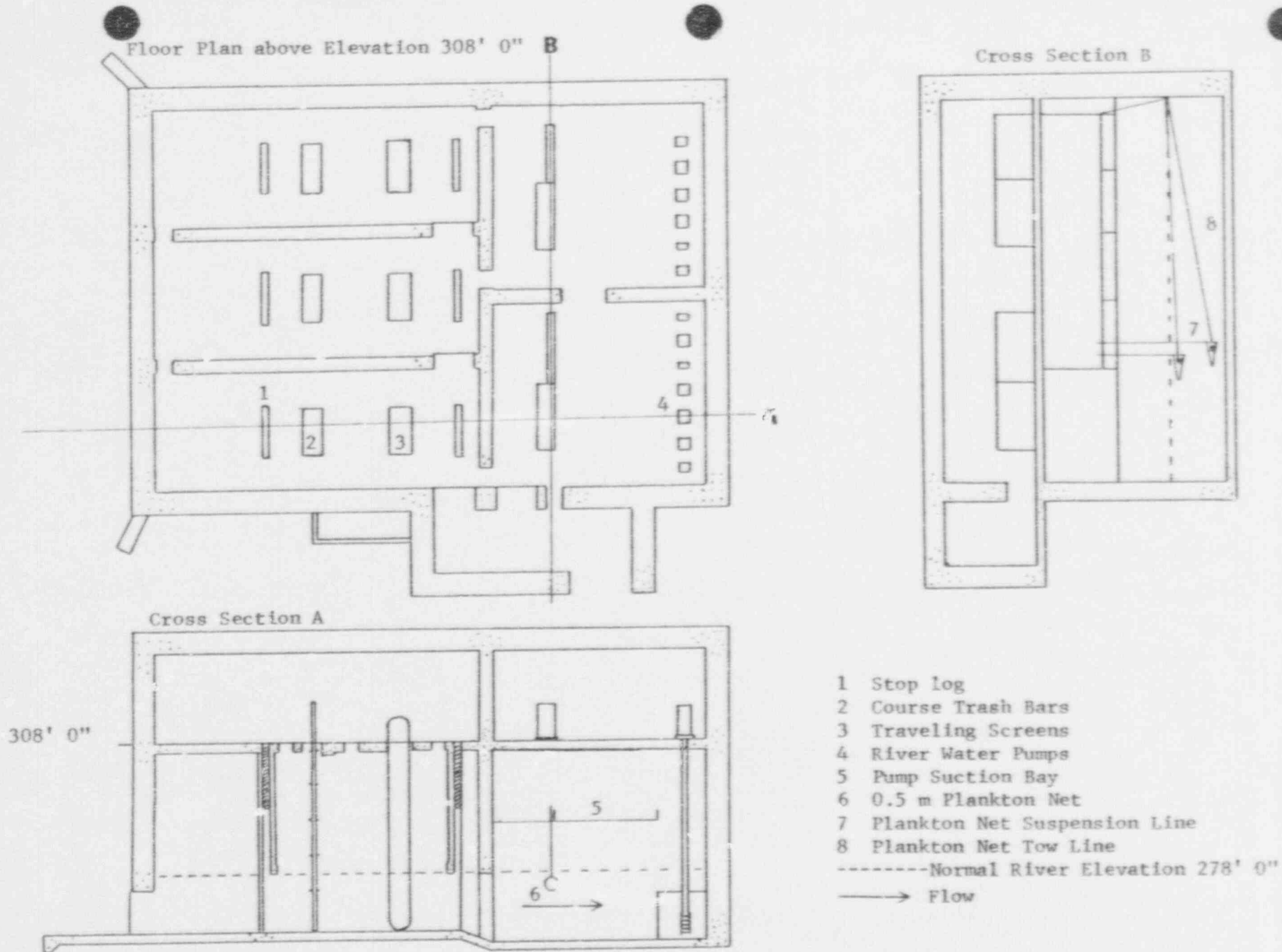
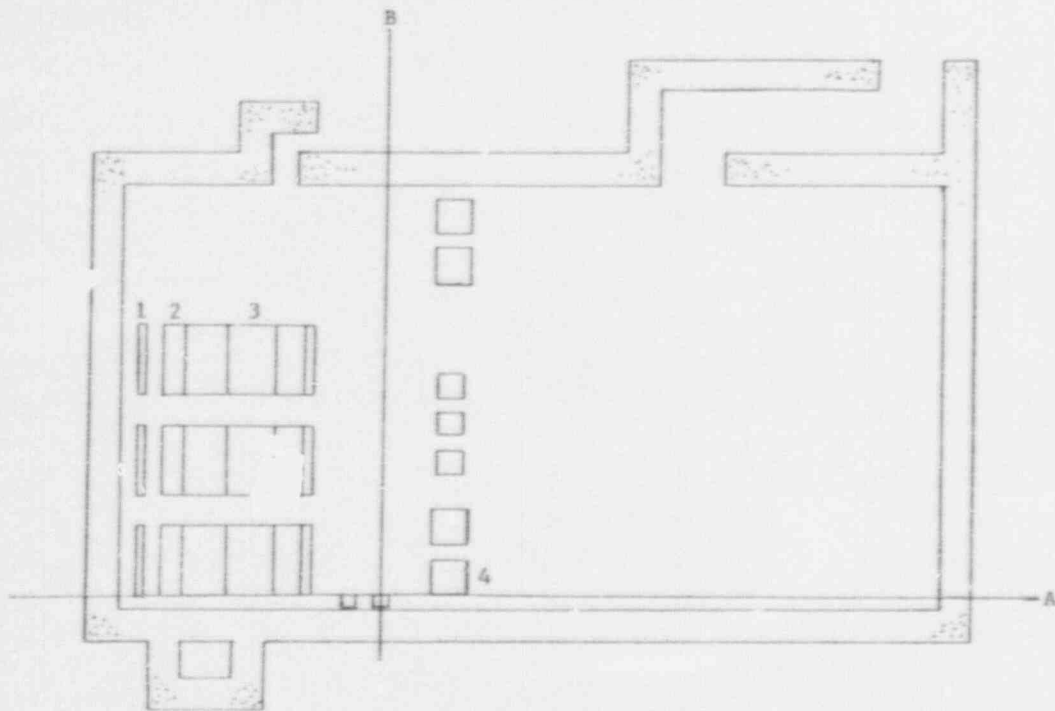
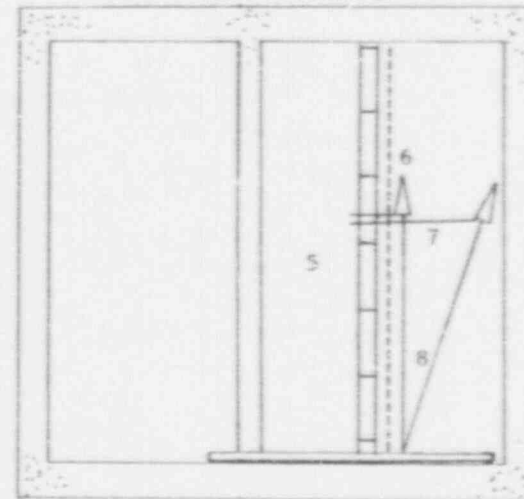


Figure 4.1-1. Three Mile Island Nuclear Station Unit 1 Intake.

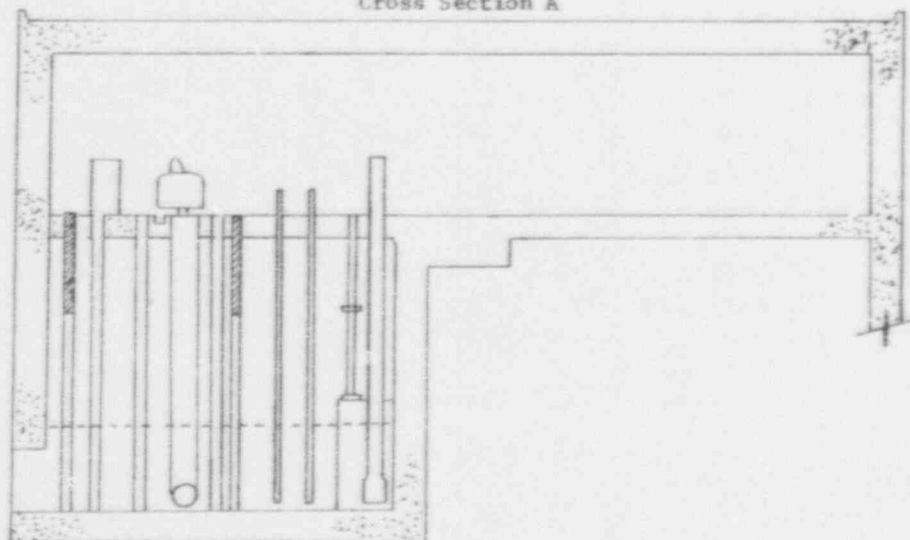
Floor Plan above Elevation 312' 0"



Cross Section B



Cross Section A



- 1 Stop log
- 2 Course Trash Bars
- 3 Traveling Screens
- 4 River Water Pumps
- 5 Pump Suction day
- 6 0.5 m Plankton Net
- 7 Plankton Net Suspension Line
- 8 Plankton Net Tow Line
- Normal River Elevation 276' 0"

Figure 4 1-2. Three Mile Island Nuclear Station Unit 2 Intake.

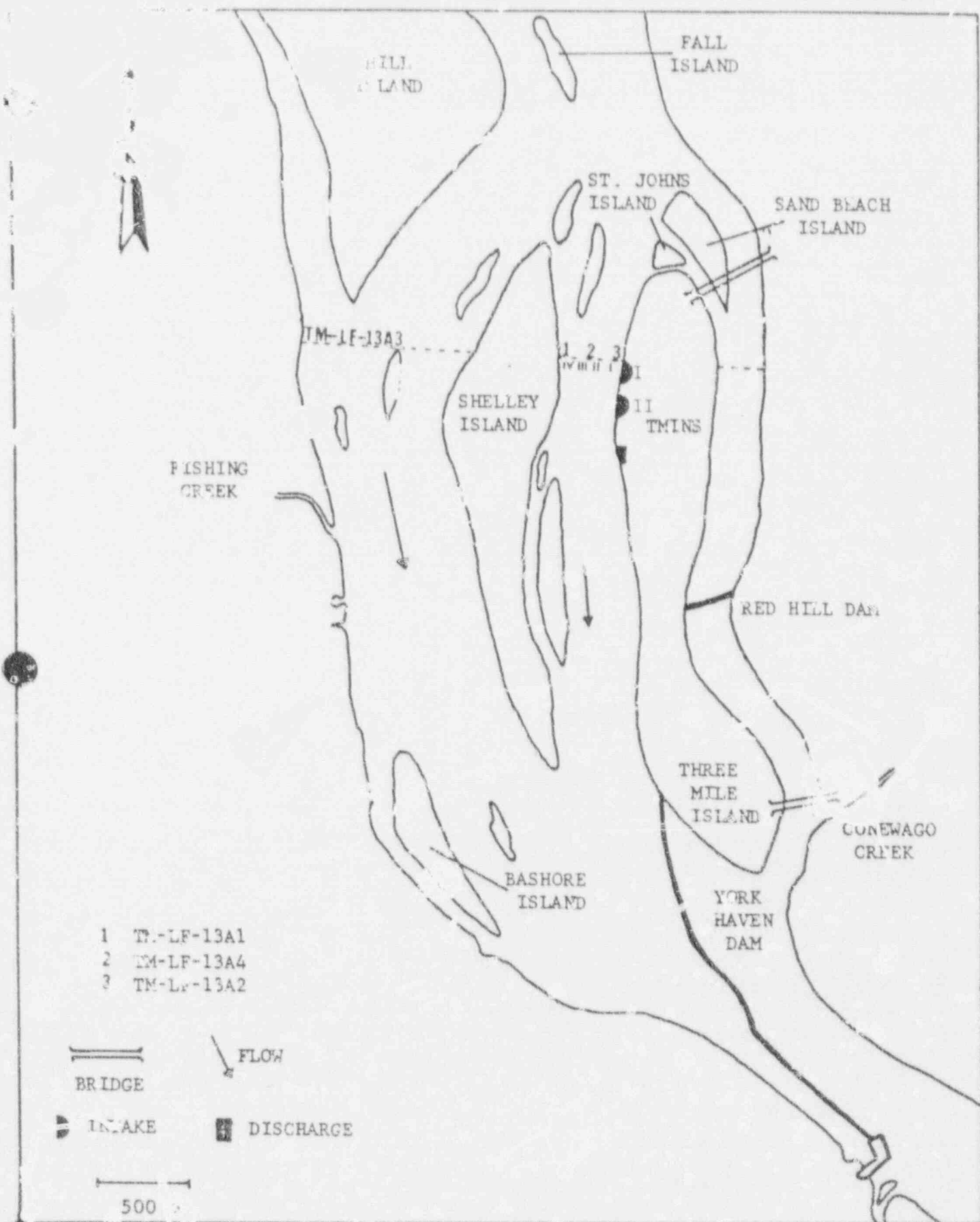


Figure 4.1-3. Location of ichthyoplankton Zones I through IV of Transect TM-LF-13A3 and ichthyoplankton Stations TM-LF-13A1, TM-LF-13A2, and TM-LF-13A4 in the center channel of York Haven Pond.

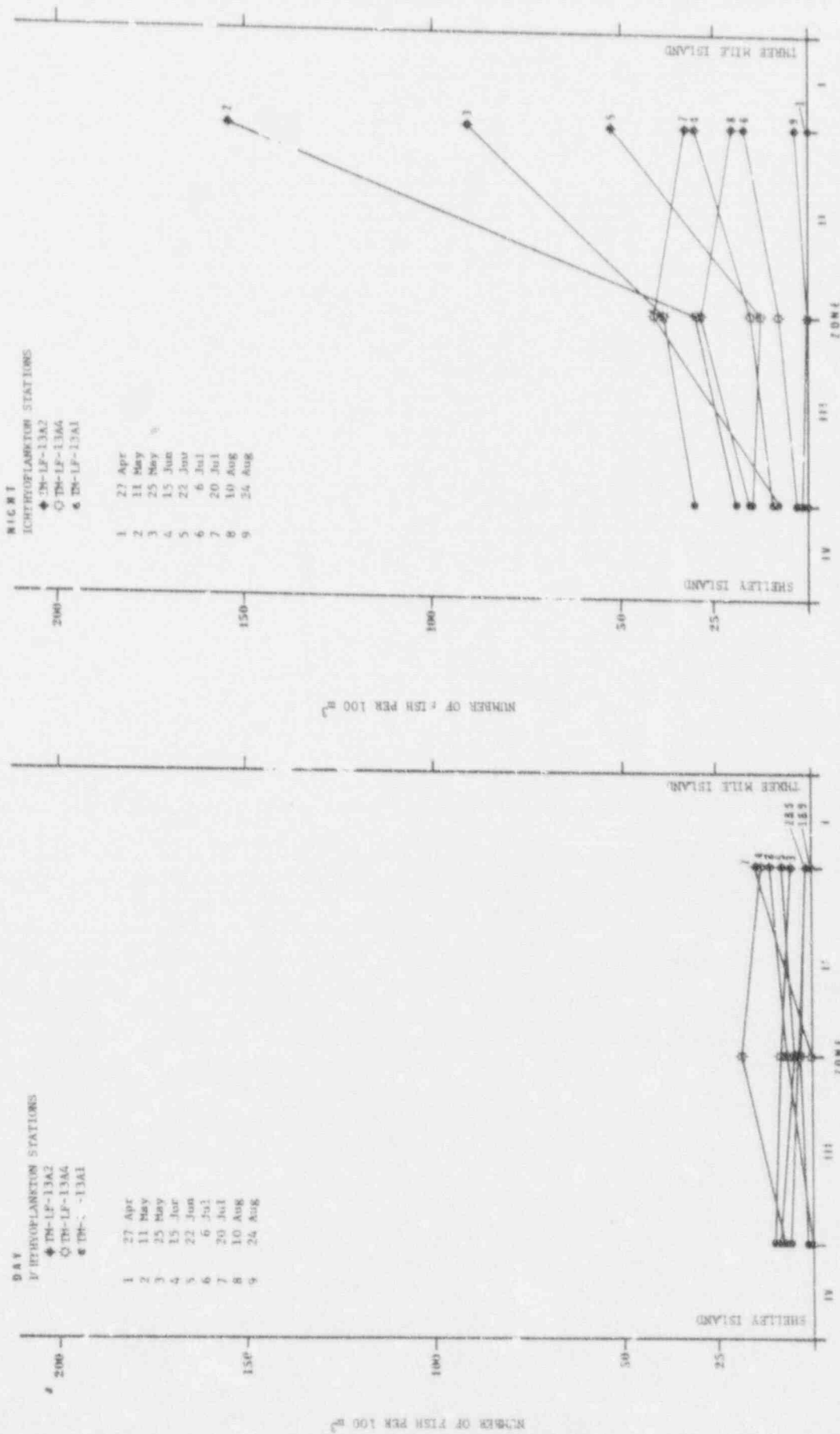
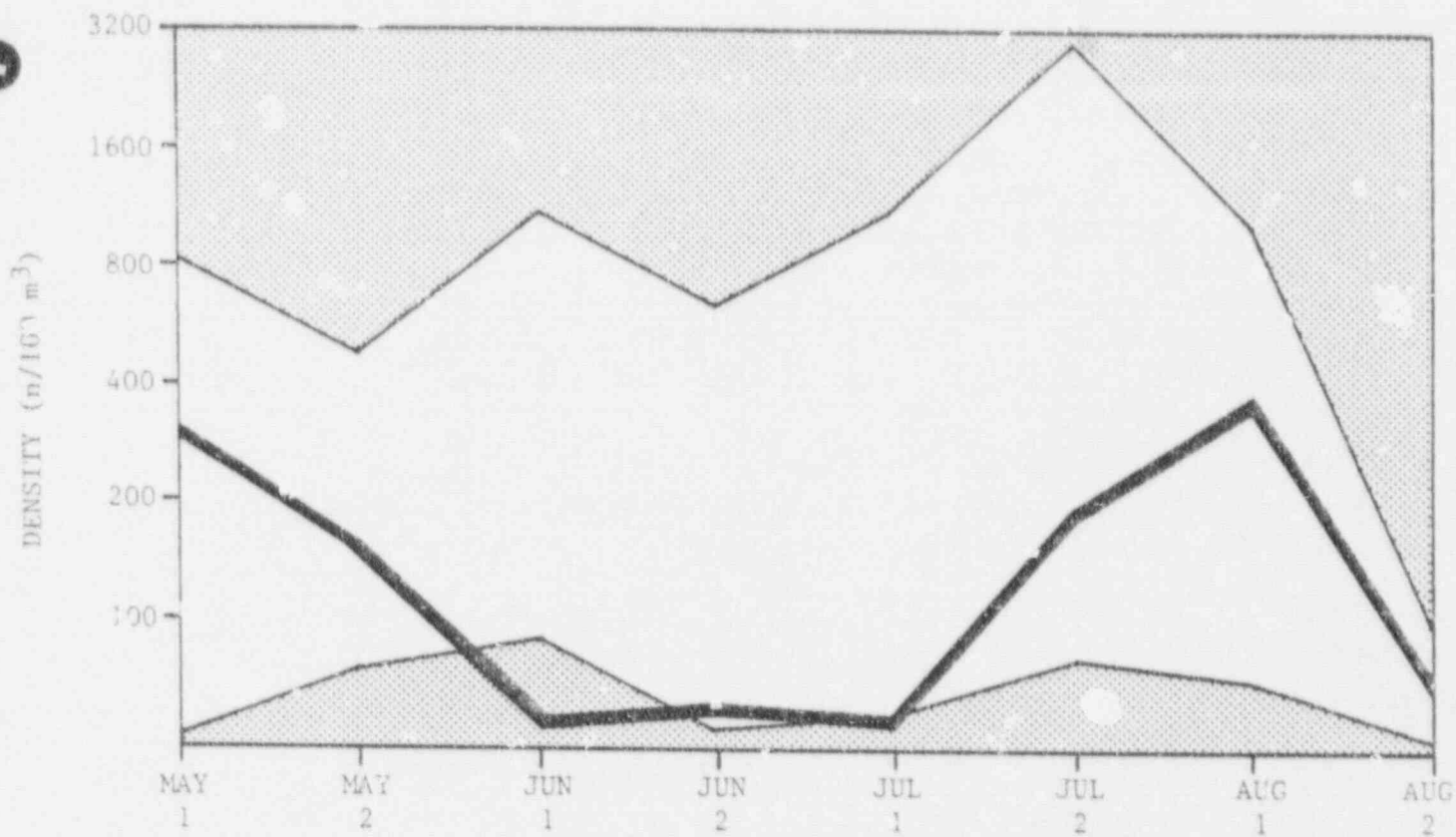


Figure 4.2-1. Distribution of Ichthyoplankton within Zones I through IV of Transect TM-LF-13A3 in York Haven Pond during day and night sample periods, 27 April through 24 August 1982.

UNIT 1



UNIT 2

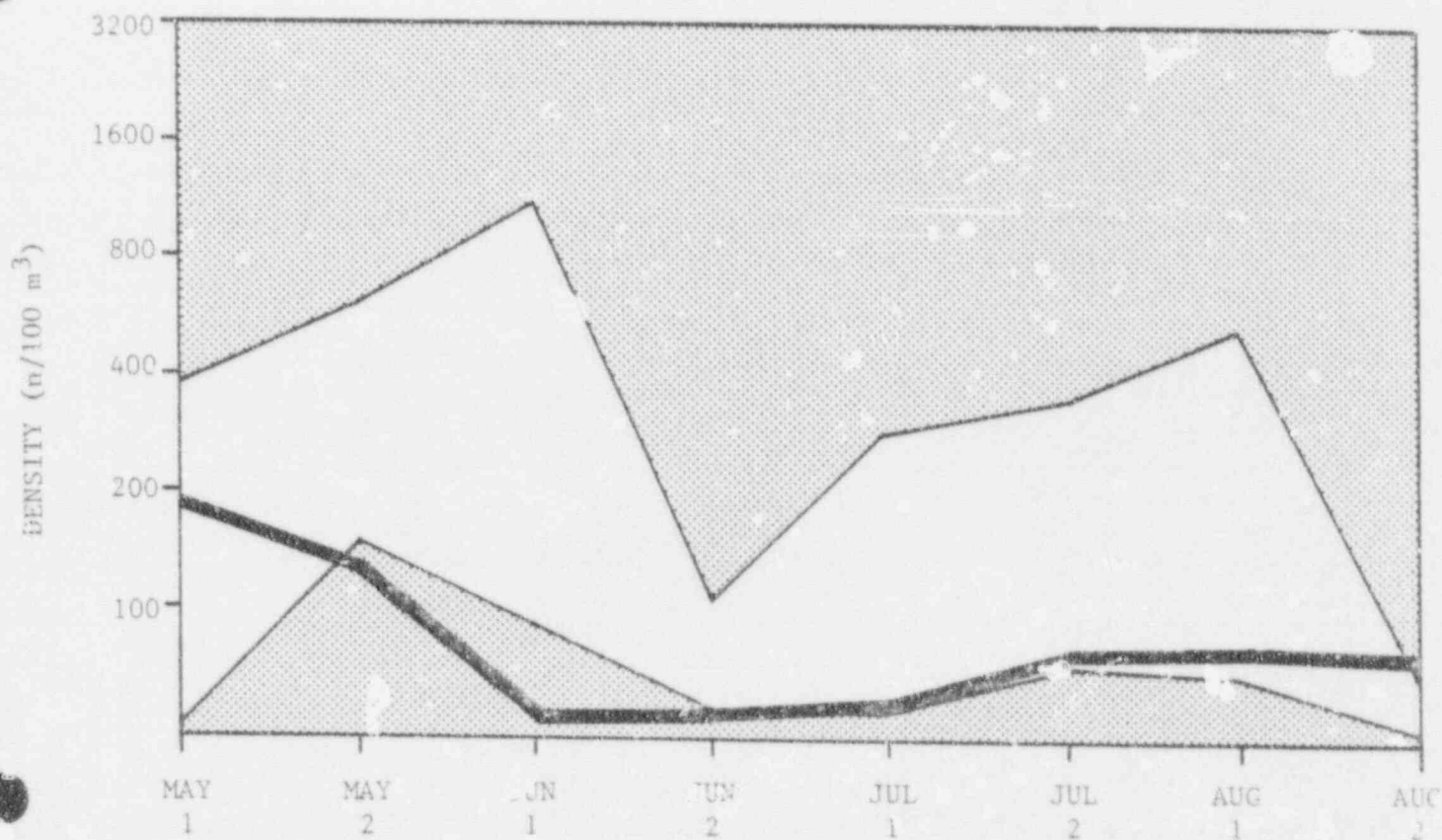


Figure 4.3-1. Density range of ichthyoplankton (white area taken in entrainment samples at T. NS Unit 1 (1976 through 1981) and Unit 2 (1978 through 1981)) compared with 1982 densities (solid line). Semimonthly sample dates indicated by a 1 or 2.

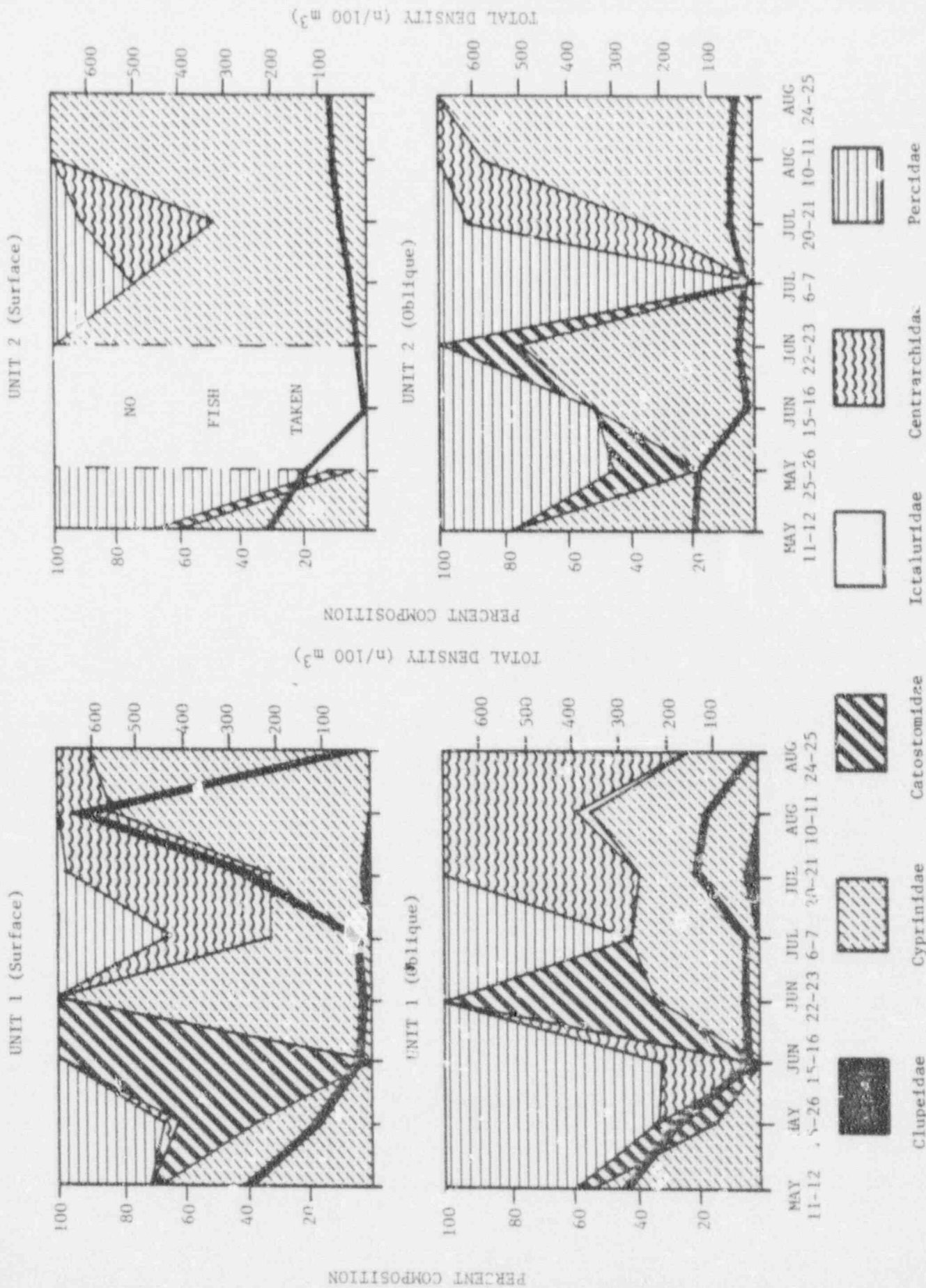


Figure 4.3-2. Percent composition and total density (n/100 m³) of the six ichthyoplankton families taken in entrainment samples (surface and oblique) at TMINS Units 1 and 2), May through August 1982. Total density indicated by the solid line.

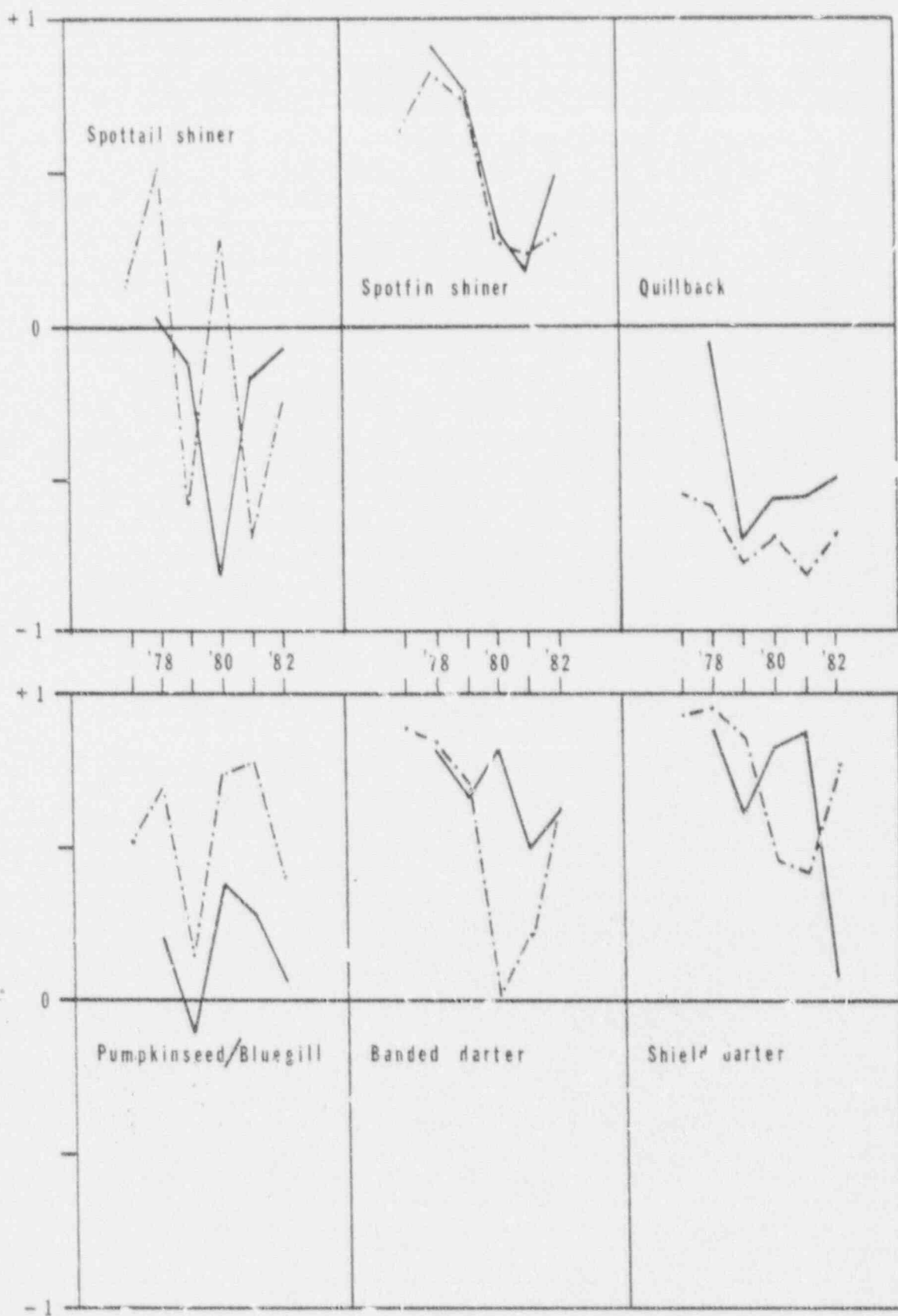


Figure 4.3-3. Entrainment bias indices for six ichthyoplankton taxa at TMINS Unit 1 (dashed line, 1977 through 1982) and Unit 2 (solid line, 1978 through 1982).

5.0 IMPINGEMENT OF FISH

Fish impinged on the intake screens at TMINS Units 1 and 2 were monitored to (1) determine numbers, species composition, and extent of mortality; (2) detect differences between sample time intervals; and (3) compare impingement at Unit 1 vs. Unit 2.

The Intakes are enclosed in separate concrete buildings located on Three Mile Island, flush with its west shore. The Intake for Unit 1 is situated about 50 m upstream of the Unit 2 Intake. River water utilized in the nuclear station's heat dissipation system, passes under concrete skimmer walls, through trash bars with 0.6 m vertical (Unit 1) and 0.3 m horizontal spacing (Unit 2), through automated trash racks with 2.4 mm bar spacing, and through 9.5 mm mesh vertical traveling screens before entering the river water pumps (Figures 5.0-1 and 5.0-2). The Intakes are designed to operate at all river flow conditions maintaining a continual internal water supply of approximately 4 m in depth. The average water approach velocity before the traveling screens during full power (100%) operating conditions is 6.1 cm/s (Atomic Energy Commission 1972a).

A timer regulated and/or differential pressure automatic backwash system at the Intakes allows for periodic washing of refuse, detritus, and fish from trash racks, vertical traveling screens, and 3.2 mm mesh river water discharge strainers. Screens at Unit 1 are backwashed automatically at 8-hour intervals, however additional washings sometimes occur

due to manual or differential pressure override. Screens at Unit 2 are set to backwash continuously; however operation can be modified utilizing manual or differential pressure override. Unit 1 has one trash bin to receive the backwash from traveling screens and river water discharge strainers and a second bin to receive trash backwash (Figure 5.0-1). One trash bin at Unit 2 receives backwash from trash racks, traveling screens, and river water discharge strainers (Figure 5.0-2).

5.1 METHODS

Semimonthly 24-hour impingement surveys were conducted January through April, and July through December at the Unit 1 and 2 Intakes. Weekly 24-hour surveys were conducted during May and June at each Intake.

The traveling screens were backwashed prior to each survey to remove all fish and/or debris present. A collection bag utilizing a section of 6.4 mm mesh seine was placed in the traveling screen trash bins to capture fish at both Units. Impinged fishes which accumulated during an 8-hour interval (1201 to 2000 h, 2001 to 0400 h, 0401 to 1200 h) constituted a sample. Samples only included whole fish; fishes decayed beyond recognition were excluded. Post mortem examination of opercular movement was used to classify fish as dead or alive. Specimens were immediately transported to the IA Laboratory and processed; samples were summarized for each 24-hour survey.

Data recorded at the end of each 8-hour interval were air and water temperatures, type (nuclear and secondary service, or decay heat) and number of river water pumps operating, and river flow (from the River

Forecast Center in Harrisburg, Pennsylvania). The Intake velocity was measured once during each 24-hour survey with a Marsh-McBirney water current meter at a point just below the surface immediately in front of the skimmer walls at each Intake. Currents not directed into Intakes were recorded as negative values.

Impinged fish were identified to the lowest possible taxon, counted, measured (to the nearest mm fork length, FL), and weighed (to the nearest 0.1 g) for each 8-hour interval. Scientific and common names of fishes and taxonomic order (Table 5.1-1) followed Robins et al. (1980). Fish numbers and weights were used in calculating yearly totals, mean numbers and biomass per survey, and mean weight per fish. Reproductive status of fish was based on field observations and information in the literature (Carlander 1953, 1969, 1977; Miller and Buss 1963; Scott and Crossman 1973; Trautman 1981). Fishes were classified as: young (spawned during the current calendar year), juvenile (incapable of reproduction, or minnows and darters less than 26 mm FL collected prior to the current spawning season), and adult (capable of reproduction).

Total estimated number and biomass of fish impinged in 1982 were calculated from the formula:

$$T = \sum (\bar{X})(N)$$

where T = estimated number or biomass, \bar{X} = mean number or biomass of fish impinged per survey per month, and N = number of days per month.

Numbers of fish impinged during each 8-hour interval at Units 1 and 2 in 1982 were compared by an analysis of variance (ANOVA) (Steel

and Torrie 1960). A two factor ANOVA was applied to numbers of fish impinged 1977 through 1982, to analyze differences among time intervals and years. Unit 1 and Unit 2 data (1978 through 1982) were treated as separate years for analysis. Data collected prior to 1977 were excluded due to differences in time intervals. Duncan's new multiple range test (Steel and Torrie 1960) was used to determine significant differences after an initial difference between means was indicated by the ANOVA. A significance level of $P \leq 0.05$ was used for all analyses.

A nonparametric binomial test (Conover 1971) was used to compare annual totals of live and dead fish from impingement surveys.

Kendall's measure of rank correlation, τ (Conover 1971) was used in comparing numbers and biomass of fishes impinged with seine (Stations 16A1 and 10A2) and electrofishing (Zone 13A1) data for 1982. Positive correlations were noted along with test results from 1976 through 1982. Seine Stations 16A1 and 10A2 and electrofishing Zone 13A1 were used for comparison due to their close proximity to the Intakes.

5.2 RESULTS

A total of 58, 24-hour impingement surveys was conducted at both TMINS Intakes (29 at each) in 1982 (Tables 5.2-1 through 5.2-116); results are summarized in Tables 5.2-117 through 5.2-120.

A total of 288 fish representing 15 species, 11 genera, and 5 families weighing 1,016.4 g (2.2 lb) was impinged at Unit 1 (Tables 5.2-117 and 5.2-118). Unit 2 impinged 221 fish of 19 species, 12 genera, and 5 families weighing 3,718.2 g (8.2 lb) (Tables 5.2-119 and 5.2-120).

Most impinged fish were young (77.1% at Unit 1, 57.0% at Unit 2) and dead (85.1% at Unit 1, 90.0% at Unit 2). Impingement at Unit 1 ranged from no fish on 26-27 January, 6-7 May, 13-14 May, and 9-10 June (Tables 5.2-4, 5.2-18, 5.2-20, and 5.2-28, respectively) to 95 fish on 24-25 February (Table 5.2-8). The number of fish impinged at Unit 2 ranged from zero on 14-15 July (Table 5.2-94) to 33 on 25-26 October (Table 5.2-108). Impingement biomass ranged from 0 to 315.0 g (0.7 lb) on 17-18 June (Table 5.2-30) and 0 to 2,121.0 g (4.7 lb) on 17-18 June (Table 5.2-88) at Units 1 and 2, respectively. The mean number of fish per survey at Unit 1 was 9.9 (0.4 fish per hour), mean biomass was 35.0 g, and mean weight per fish was 3.5 g. Unit 2 impinged an average of 7.6 fish per survey (0.3 fish per hour), a mean biomass of 128.2 g, and a mean weight per fish of 16.8 g.

The five most frequently impinged fishes at Unit 1 were the spotfin shiner (26.7% of the total fish impinged), pumpkinseed (14.6%), Lepomis spp. (14.2%), tessellated darter (13.9%), and bluegill (11.1%); collectively accounting for 80.5% of the total catch (Table 5.2-117). Other fishes that comprised at least 1.0% of the total catch were spottail shiner, yellow bullhead, channel catfish, rock bass, and redbreast sunfish.

The four most frequently impinged fishes at Unit 2 were the tessellated darter (21.7% of the total fish impinged), channel catfish (11.3%), redbreast sunfish (10.0%), and pumpkinseed (9.5%); together they comprised 52.5% of the total catch (Table 5.2-119). Rock bass (8.6%), spotfin shiner (8.1%), and spottail shiner (7.2%) were also common. Other fishes comprising greater than 1.0% of the total were common carp,

bluntnose minnow, yellow bullhead, margined madtom, bluegill, and Lepomis spp. The mimic shiner, a new addition to the impingement species list, was collected for the first time on 6-7 May (Table 5.2-76).

Over 80% of the total biomass of fishes impinged at Unit 1 consisted of quillback (31.0%, 1 specimen), pumpkinseed (22.5%, 42 specimens), yellow bullhead (14.1%, 5 specimens), and rock bass (12.7%, 15 specimens) (Tables 5.2-117 and 5.2-118). Three fishes accounted for 85% of the total biomass impinged at Unit 2: quillback (54.9%, 1 specimen), rock bass (18.3%, 19 specimens), and channel catfish (11.8%, 25 specimens) (Tables 5.2-119 and 5.2-120).

The estimated number and biomass of fishes impinged at Unit 1 in 1982 were 4,085 fish and 10.3 kg (22.7 lb), respectively. Unit 2 impinged an estimated 3,071 fish weighing 32.0 kg (70.6 lb). A combined estimation of fish impinged at Units 1 and 2 for 1982 was 7,156 fish weighing 42.3 kg (93.3 lb).

Results of the ANOVA showed no significant differences in numbers of fish impinged during the three time intervals at Units 1 and 2 in 1982 (Table 5.2-121).

The nonparametric binomial test indicated significantly more fish were dead ($P = 0.05$) than alive at both Intakes in 1982 (Table 5.2-122).

Kendall's τ correlations indicated that the species ranks of numbers and biomass for Units 1 and 2 were positively correlated ($P \leq 0.05$) in 1982 (Table 5.2-123). However, the only correlations of seine Stations 16A1 and 10A2 and electrofishing Zone 13A1 with Units 1 and 2 occurred when the combined biomass ranks of the seine and electrofishing data were compared to impingement biomass.

5.3 DISCUSSION

In 1982, the number of fish impinged at Unit 1 was the fourth lowest and biomass third lowest since the program began in 1974 (Table 5.3-1 and Figure 5.3-1). Unit 1 showed a 1.4-fold decrease in number impinged and a 1.3-fold decrease in mean weight per fish from 1981 totals. The number of fish impinged at Unit 2 in 1982 decreased to the lowest level, while biomass increased to the highest level since its first year of operation (1978), resulting in a record increase in mean weight per fish. This indicated the impingement of relatively small numbers of larger fish. A large contributing factor was the single adult quillback impinged on 17-18 June, which weighed 2,041.0 g and comprised greater than 54% of the total biomass. Most fishes impinged by TMINS have been young, possibly due to the ability of most adult fishes to avoid the low intake velocities. Generally, the numbers, biomass, and mean weight per fish impinged have fluctuated since the inception of the program. Wide variations in number occurred at Unit 1 from 1974 through 1978, with the major peak in 1977 followed by the record low in 1978. However, since 1978 numbers impinged at Unit 1 have remained relatively stable.

Impingement numbers at Unit 2 reached their peak in 1981. Total biomass has been a much more erratic value throughout the years at both Units.

Four fishes accounted for over 69% and 52% of the total number of fish impinged in 1982 at Unit 1 (spotfin shiner, pumpkinseed, Lepomis spp., and tessellated darter) and Unit 2 (channel catfish, redbreast sunfish, pumpkinseed, and tessellated darter), respectively. The spotfin shiner

was the most frequently impinged species at Unit 1, while the tessellated darter was impinged most frequently at Unit 2 (Tables 5.3-1 and 5.3-2). Four fishes also accounted for over 80% of the total biomass impinged at Unit 1 (quillback, yellow bullhead, rock bass, and pumpkinseed) (Table 5.2-118), while three fishes represented 85% of the biomass at Unit 2 (quillback, channel catfish, and rock bass) (Table 5.2-120). Quillback comprised the largest percentage by weight at both Units consisting of a single specimen at each (Tables 5.3-1 and 5.3-2).

The tessellated darter was the most frequently impinged species at Unit 1 for all years, except 1978 and 1982, comprising over 29% of the total each year (Table 5.3-1). Spottail shiner which comprised less than 16% of the total catch in all previous years was most abundant (26.7%) at Unit 1 in 1982. Other fishes that accounted for more than 10% of the yearly catch at Unit 1 were spottail shiner in 1976, 1978, and 1981; spottail shiner in 1974; channel catfish from 1974 through 1976 and 1978 through 1980; margined madtom in 1979; pumpkinseed from 1980 through 1982; bluegill in 1982; Lepomis spp. in 1982; smallmouth bass in 1978; and banded darter in 1977 and 1978. The tessellated darter was also most frequently impinged at Unit 2 for all years, except 1978, comprising over 16% of the total each year (Table 5.3-2). Other commonly impinged taxa (>10%) at Unit 2 were spottail shiner in 1978, channel catfish from 1980 through 1982; pumpkinseed in 1980, Lepomis spp. in 1979, smallmouth bass in 1978, and walleye in 1979. Sharma (1978) indicated that the most important factors affecting the number and species of fish impinged are

the distribution and density of fishes near an intake. Hoyt (1979) stated that impingement is a function of size and composition of native ichthyofauna in the area of an intake. Varying species composition between years may be a result of year class fluctuations and/or dynamic physical and environmental variables.

In general, cyprinids (predominantly minnows), ictalurids, centrarchids (predominantly sunfishes), and percids (predominantly darters) comprised nearly 99% of the total fish impinged at TMINS (both Units). Clupeids (herring), catostomids (suckers), and gasterosteids (sticklebacks) have occasionally been impinged but accounted for about 1% of the total number. Due in part to the relatively small numbers impinged, generalizations regarding seasonality cannot readily be made excepting that fluctuations in numbers were variable within and between years. Mathur et al. (1971), during impingement studies on the lower Susquehanna River, also noted that the rate of impingement of fishes varied considerably among months and between years. This is reflective of the interactions of many variables such as water temperature, river flow, intake velocity, fish density and distribution, seasonal and diurnal movements of fish, and fish spawning time and location (Lifton and Storr 1978). Hoyt (1979) noted that even when trends or patterns in impingement were noted, no one environmental parameter or combination of factors could be deemed solely responsible for influencing impingement. Therefore, as suggested by the data presently available, the prediction of future impingement totals and mortalities at TMINS may be inappropriate.

A comparison of the numbers of fish impinged during three 8-hour time intervals from 1977 through 1982 showed few differences. The two factor ANOVA indicated no significant differences ($P \leq 0.05$) between time intervals but differences between years were noted (Table 5.3-3). Landry and Strawn (1974), Grimes (1975), and Thomas and Miller (1976) all found a significantly higher rate of impingement during dark periods. The lower impingement rate during daylight hours, in some instances, was hypothesized to be a visual response to intake screens by fish (Landry and Strawn 1974). The lack of significance between time intervals indicated by the two factor ANOVA parallels results reported in Mathur et al. (1977) and Hoyt (1979). Duncan's new multiple range test indicated that numbers of fish impinged at Unit 1 in 1977 were significantly greater than those at either Units for all other years (Table 5.3-4).

The nonparametric binomial test indicated that significantly more fish ($P \leq 0.05$) were dead than alive at both Units for all years, excepting Unit 1 in 1978 and 1979 (Table 5.2-122). Since its first year of operation (1978) Unit 2 has had larger percentages of dead fish than Unit 1 (Figure 5.3-2).

Kendall's measure of rank correlation tests for numbers and biomass of fish impinged (1976 through 1982) indicated a close relation between the species composition at Units 1 and 2 (Table 5.3-5). Mathur et al. (1977) also noted similarities in species composition of impinged fishes between Units at another nuclear generating station on the lower Susquehanna River. Test results from 1976 through 1979 showed correlations

of species composition between seine Stations 16A1 and 10A2, electrofishing Zone 13A1, and Units 1 and 2; however, none were exceptionally strong (Nardacci and Associates 1980, 1981). Therefore, despite the close proximity of seine and electrofishing stations to the Intakes, use of these data to predict or forecast fish impingement seems inadvisable.

Mathur et al. (1977) referred to a nuclear generating station as a predator and related impingement losses to angling mortality. The percent occurrence of game fishes (smallmouth bass, largemouth bass, and walleye) impinged by TMINS accounted for less than 5% of the total (at either Unit) (Tables 5.3-1 and 5.3-2). A general comparison of catch rates between the Intakes and creel surveys (see Section 9.0) for 1982 indicated a rate of 0.41 and 0.32 fish impinged per hour at Units 1 and 2, respectively, and 1.34 fish caught per hour by anglers. Observed impingement mortalities of 0.35 and 0.29 fish per hour (Units 1 and 2, respectively) compared to an angler harvest of 0.37 fish kept per hour. Therefore, disregarding a comparison of species composition of fishes impinged and those caught by anglers and season of catch, impingement rates were apparently lower than the catch rate of a single angler near TMINS.

Sharma (1978) states that the most important factors affecting the impingement of fish are their density and distribution near the intake structure. All variables influencing density and distribution synergistically or antagonistically produce a combined net effect on impingement, and isolation of the effects of a single variable is extremely difficult (Sharma 1978). Variation in impingement, within and between

years, may be indicative of the random presence of fishes, dynamic physical parameters, and environmental conditions near the Intakes. The impact of impingement upon Susquehanna River fish populations near TMINS was negligible in 1982.

Table 5.1-1

List of scientific and common names of fishes impinged during 24-hour surveys at TMINS Unit 1 and 2 Intakes, 1982.

Scientific Name	Common Name
Cyprinidae	
<u>Cyprinus carpio</u> Linnaeus	Carp and Minnows Common carp
<u>Notropis hudsonius</u> (Clinton)	Spottail shiner
<u>Notropis spilopterus</u> (Cope)	Spotfin shiner
<u>Notropis volucellus</u> (Cope)	Mimic shiner
<u>Pimephales notatus</u> (Rafinesque)	Bluntnose minnow
<u>Serotilus corporalis</u> (Mitchill)	Fallfish
Catostomidae	
<u>Carpiodes cyprinus</u> (Lesueur)	Suckers Quillback
<u>Catostomus commersoni</u> (Lacepède)	White sucker
<u>Moxostoma macrolepidotum</u> (Lesueur)	Shorthead redhorse
Ictaluridae	
<u>Ictalurus natalis</u> (Lesueur)	Bullhead catfishes Yellow bullhead
<u>Ictalurus punctatus</u> (Rafinesque)	Channel catfish
<u>Noturus insignis</u> (Richardson)	Margined madtom
Centrarchidae	
<u>Ambloplites rupestris</u> (Rafinesque)	Sunfishes Rock bass
<u>Lepomis auritus</u> (Linnaeus)	Redbreast sunfish
<u>Lepomis cyanellus</u> Rafinesque	Green sunfish
<u>Lepomis gibbosus</u> (Linnaeus)	Pumpkinseed
<u>Lepomis macrochirus</u> Rafinesque	Bluegill
<u>Micropterus dolomieu</u> Lacepède	Smallmouth bass
<u>Pomoxis annularis</u> Rafinesque	White crappie
Percidae	
<u>Etheostoma olmstedi</u> Storer	Perches Tessellated darter
<u>Etheostoma zonale</u> (Cope)	Banded darter

Table 5.2-1

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 18-19 January 1982.

Date	18	19	19		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Decay Heat	0	0	0		
Intake Velocity (cm/s)	NA	NA	NA		
River Flow (m ³ /s)	1740.7	1621.5	1577.2		
Air Temp (C)	-10.0	-10.0	-3.0		
Water Temp (C)	0.0	0.0	0.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	-	-	-	1
Total	-	-	-	-	1

NA Not Available.

Table 5.2-2

Summary of length, weight, reproductive status, and number of fish impinged at the Unit 1 Intake on 18-19 January 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	86-90	1 Adult	6.8	1
Total			6.8	1

Table 5.2-3

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 26-27 January 1982.

Date	26	27	27		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Decay Heat	0	0	0		
Intake Velocity (cm/s)	NA	NA	NA		
River Flow (m ³ /s)	1557.4	1597.4	1557.4		
Air Temp (C)	-6.0	-10.0	0.0		
Water Temp (C)	0.0	0.0	0.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
	NO FISH TAKEN				

NA Not Available.

Table 5.2-4

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 26-27 January 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
NO FISH TAKEN				

Table 5.2-5

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 11-12 February 1982.

Date	11	12	12		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Decay Heat	0	0	0		
Intake Velocity (cm/s)	NA	NA	NA		
River Flow (m ³ /s)	1286.3	1269.3	1262.9		
Air Temp (C)	+3.0	-7.0	1.0		
Water Temp (C)	0.0	0.0	0.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Fallfish	1	-	-	-	1
Rock bass	-	-	-	2	-
Redbreast sunfish	-	-	-	1	-
Lepomis spp.	-	-	-	1	-
Smallmouth bass	-	-	-	-	1
Tessellated darter	3	-	-	2	8
Total	4	1	-	7	10

NA Not Available.

Table 5.2-6

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 11-12 February 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Fallfish	66-70	1 Juvenile	4.4	1
Rock bass	36-65	2 Young	11.3	2
Redbreast sunfish	41-45	1 Young	2.0	1
Lepomis spp.	21-25	1 Young	0.3	1
Shallmouth bass	76-80	1 Young	8.6	1
Unassisted darter	36-55	2 Young, 10 Juvenile, 3 Adult	16.2	15
Total			48.8	21

Table 5.2-7

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 24-25 February 1982.

Date	24	25	25					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	0	0	0					
Intake Velocity (cm/s)	NA	NA	NA					
River Flow (m ³ /s)	1238.9	1233.2	1231.8					
Air Temp (°C)	-1.0	-6.0	-2.0					
Water Temp (°C)	1.5	1.0	1.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Spotfin shiner	-	-	1	26	-	45	1	71
Channel catfish	-	-	-	1	-	1	-	2
Redbreast sunfish	-	-	-	2	1	-	1	2
Pumpkinseed	1	-	-	4	1	4	2	8
Lepomis spp.	-	-	-	1	-	-	-	1
Unassisted darter	4	-	-	-	-	3	4	7
Total	5	-	1	34	2	53	8	87

NA Not Available.

Table 5.2-8

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 24-25 February 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spotfin shiner	21-50	54 Young, 18 Juvenile	35.5	72
Channel catfish	51-60	2 Young	3.6	2
Redbreast sunfish	26-40	3 Young	1.8	3
Pumpkinseed	26-45, 106-110, 141-145	8 Young, 2 Adult	99.4	10
Lepomis spp.	21-25	1 Young	0.3	1
Unassisted darter	41-55	6 Juvenile, 1 Adult	5.3	7
Total			146.2	95

Table 5.2-9

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 17-18 March 1982.

Date	17	18	18					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	0	0	0					
Intake Velocity (cm/s)	NA	NA	NA					
River Flow (m ³ /s)	3695.3	3581.7	3539.6					
Air Temp (°C)	6.0	4.0	8.0					
Water Temp (°C)	2.5	1.0	2.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Spotfin shiner	-	-	-	-	1	-	1	
Channel catfish	-	-	1	-	3	-	4	
Rock bass	1	-	-	-	-	-	1	
Pumpkinseed	-	2	-	-	-	-	2	
Unassisted darter	-	-	-	-	1	-	1	
Total	1	2	1	-	5	-	7	

NA Not Available.

Table 5.2-10

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 17-18 March 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Pin shiner	71-75	1 Adult	3.5	1
Channel catfish	46-50, 61-65, 71-75	4 Young	11.2	4
Rock bass	121-125	1 Juvenile	50.1	1
Pumpkinseed	31-35, 41-45	2 Young	2.1	2
Tessellated darter	41-45	1 Juvenile	0.7	1
Total			67.6	9

Table 5.2-11

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 30-31 March 1982.

Date	30	31	31		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Decay Heat	0	0	0		
Intake Velocity (cm/s)	-22	-22	-12		
River Flow (m ³ /s)	2413.0	2258.2	2200.2		
Air Temp (C)	12.0	11.0	13.0		
Water Temp (C)	5.0	5.5	5.5		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Rock bass	-	-	1	-	1
Pumpkinseed	-	-	1	-	1
Tessellated darter	-	2	-	-	2
Total	-	2	1	-	3

Table 5.2-12

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 30-31 March 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Rock bass	131-135	1 Juvenile	51.6	1
Pumpkinseed	121-125	1 Adult	44.3	1
Tessellated darter	36-35, 61-65	1 Young, 2 Juvenile, 2 Adult	5.6	5
Total			101.5	7

Table 5.2-13

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 15-16 April 1982.

Date	15	16	16		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Decay Heat	0	0	0		
Intake Velocity (cm/s)	-22	-22	-12		
River Flow (m ³ /s)	1651.3	1532.5	1625.4		
Air Temp (C)	13.0	10.5	19.0		
Water Temp (C)	9.5	9.0	9.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	-	-	2	2
Tessellated darter	-	-	1	-	1
Total	-	-	1	2	3

Table 5.2-14

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 15-16 April 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	91-100	2 Adult	18.8	2
Tessellated darter	41-45, 51-55	1 Juvenile, 1 Adult	2.1	2
Total			20.9	4

Table 5.2-15

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 27-28 April 1982.

Date	27	28	28				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.33	1.33	1.33				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Decay Heat	1	1	1				
Intake Velocity (cm/s)	23	-23	-23				
River Flow (m ³ /s)	966.1	969.9	971.3				
Air Temp (C)	13.5	13.0	16.5				
Water Temp (C)	14.0	17.1	13.0				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	1	-	-	-	-	1
Total	-	1	-	-	-	-	1

Table 5.2-16

Summary of length, weight, reproductive status, and numbers of fishes impinged at the Unit 1 Intake on 27-28 April 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	36-40	1 Young	0.7	1
Total			0.7	1

Table 5.2-17

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 6-7 May 1982.

Date	6	7	7				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	0.84	1.71	0.84				
Number of River Water Pumps:							
Nuclear Service	1	2	1				
Secondary Service	1	1	1				
Decay Heat	0	1	0				
Intake Velocity (cm/s)	-9	-9	-9				
River Flow (m ³ /s)	541.6	527.6	518.2				
Air Temp (C)	21.0	16.0	25.0				
Water Temp (C)	14.5	18.0	10.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
							NO FISH TAKEN

Table 5.2-18

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 6-7 May 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
				NO FISH TAKEN

Table 5.2-19

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 13-14 May 1982.

Date	13	14	14				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.33	0.84	0.84				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Decay Heat	1	0	0				
Intake Velocity (cm/s)	-14	-14	-14				
River Flow (m ³ /s)	580.0	553.6	543.7				
Air Temp (C)	14.0	17.0	25.0				
Water Temp (C)	22.0	21.0	21.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
							NO FISH TAKEN

Table 5.2-20

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 13-14 May 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
				NO FISH TAKEN

Table 5.2-21

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 18-19 May 1982.

Date	18	19	19					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	0.74	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	0	0	0					
Intake Velocity (cm/s)	-9	-9	-9					
River Flow (m ³ /s)	401.4	395.7	393.8					
Air Temp (C)	24.0	18.0	24.0					
Water Temp (C)	24.0	23.0	22.5					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Channel catfish	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-

Table 5.2-22

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 18-19 May 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Channel catfish	101-105	1 Juvenile	13.3	1
Total			13.3	1

Table 5.2-23

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 27-28 May 1982.

Date	27	28	28					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.33	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	1	0	0					
Intake Velocity (cm/s)	-12	-12	-12					
River Flow (m ³ /s)	931.2	904.7	894.8					
Air Temp (C)	23.5	20.0	18.5					
Water Temp (C)	21.0	20.0	20.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Yellow perch	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-	-

Table 5.2-24

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 27-28 May 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Yellow perch	116-120	1 Juvenile	20.6	1
Total			20.6	1

Table 5.2-25

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 3-4 June 1982.

Date	3	4	4					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.33	1.33	1.79					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	2					
Decay Heat	1	1	1					
Intake Velocity (cm/s)	-13	-13	-13					
River Flow (m ³ /s)	1445.3	1477.4	1489.5					
Air Temp (C)	17.0	18.5	17.5					
Water Temp (C)	21.0	21.0	19.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
White sucker	-	-	-	-	-	-	-	-
Pumpkinseed	2	-	-	-	-	-	2	-
Tessellated darter	-	-	-	-	-	-	-	-
Total	2	-	-	-	-	-	2	-

Table 5.2-26

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 3-4 June 1981

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
White sucker	21-25	1 Young	0.2	1
Pumpkinseed	91-95, 116-120	2 Adult	68.5	2
Tessellated darter	16-25	2 Young	0.3	2
Total			69.0	5

Table 5.2-27

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 9-10 June 1982.

Date	9	10	10				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Decay Heat	0	0	0				
Intake Velocity (cm/s)	-25	-25	-25				
River Flow (m ³ /s)	3160.4	1881.3	2775.1				
Air Temp (C)	22.0	18.0	17.5				
Water Temp (C)	17.5	17.5	17.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Total	NO FISH TAKEN						

Table 5.2-28

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 9-10 June 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Total	NO FISH TAKEN			

Table 5.2-29

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 17-18 June 1982.

Date	17	18	18				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Decay Heat	0	0	0				
Intake Velocity (cm/s)	-19	-19	-19				
River Flow (m ³ /s)	1571.6	1571.6	1571.6				
Air Temp (C)	24.0	20.0	27.5				
Water Temp (C)	20.5	20.5	21.0				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Quillback	-	-	-	1	-	-	1
Total	-	-	-	1	-	-	1

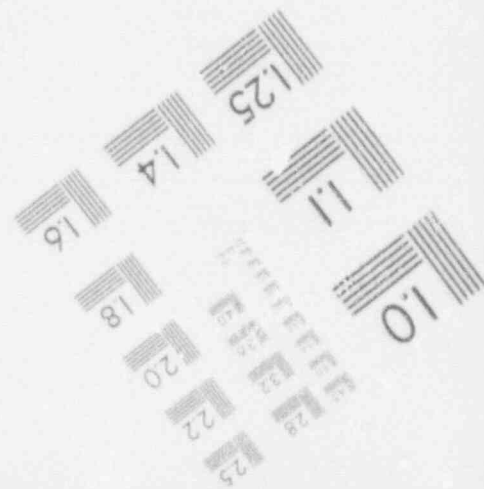
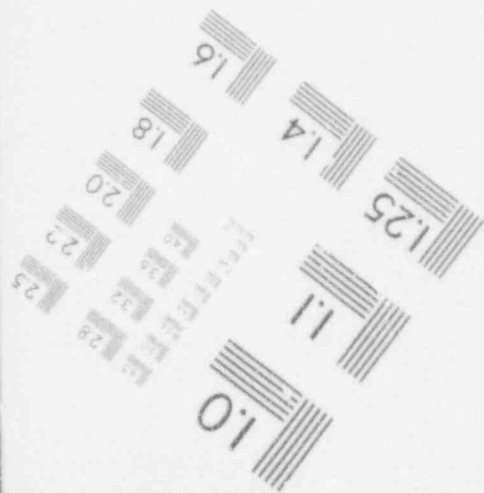
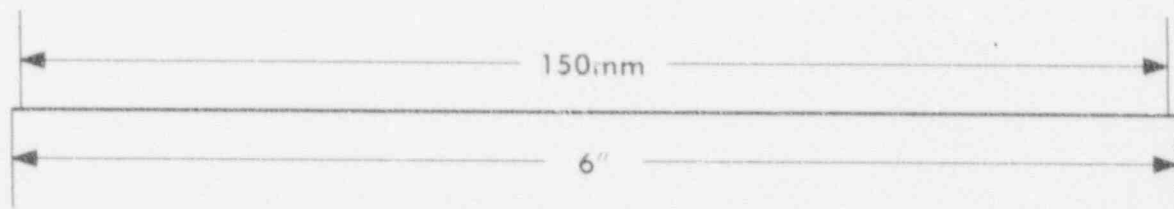
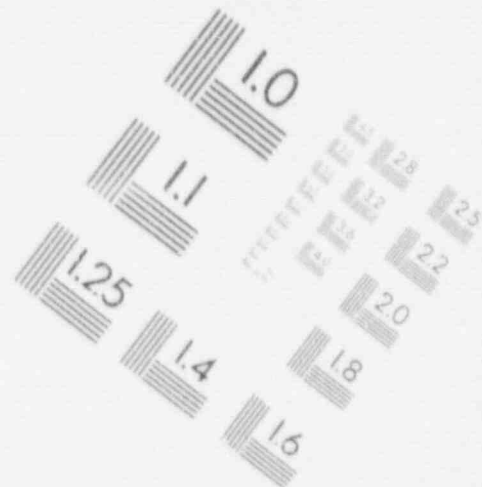
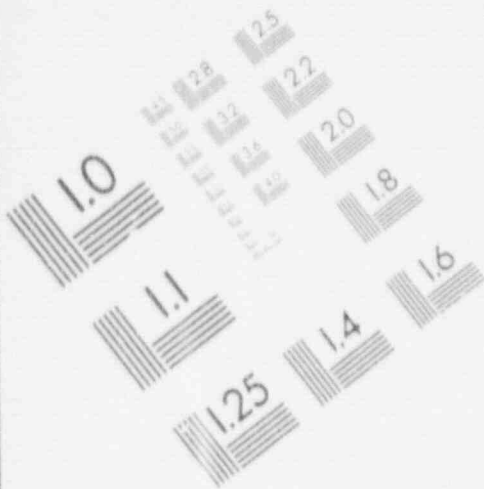
Table 5.2-30

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 17-18 June 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Quillback	251-255	1 Adult	315.0	1
Total			315.0	1

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IMAGE EVALUATION TEST TARGET (MT-3)



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Table 5.2-31

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 23-24 June 1982.

Date	23	24	24				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Decay Heat	0	0	0				
Intake Velocity (cm/s)	+20	+20	+20				
River Flow (m ³ /s)	881.3	841.7	824.8				
Air Temp (C)	23.0	21.0	26.5				
Water Temp (C)	21.5	17.0	21.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
White sucker	-	-	-	1	-	-	1
Pumpkinseed	-	-	-	-	-	1	1
Tessellated darter	-	-	-	-	-	1	1
Total	-	-	-	1	-	2	3

Table 5.2-32

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 23-24 June 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
White sucker	30-40	1 Young	0.6	1
Pumpkinseed	61-65	1 Juvenile	6.2	1
Tessellated darter	21-25	1 Young	1.2	1
Total			7.0	3

Table 5.2-33

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 29-30 June 1982.

Date	29	30	30				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Decay Heat	0	0	0				
Intake Velocity (cm/s)	+10	+10	+10				
River Flow (m ³ /s)	613.6	606.0	603.2				
Air Temp (C)	24.0	23.0	21.5				
Water Temp (C)	25.5	24.0	23.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	-	-	-	-	1	1
Spotfin shiner	-	1	-	-	-	2	3
Yellow bullhead	-	-	-	1	-	1	2
Tessellated darter	-	-	-	-	-	4	4
Total	-	1	-	1	-	8	10

Table 5.2-34

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 29-30 June 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	26-30	1 Young	0.1	1
Spotfin shiner	21-30, 41-45	2 Young, 1 Juvenile	1.2	3
Yellow bullhead	96-100, 171-175	1 Juvenile, 1 Adult	121.5	2
Tessellated darter	26-30	4 Young	0.8	4
Total			131.6	10

Table 3.2-35

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 14-15 July 1982.

Date	14	15	15							
Time	2000	0400	1200							
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84							
Number of River Water Pumps:										
Nuclear Service	1	1	1							
Secondary Service	1	1	1							
Decay Heat	0	0	0							
Intake Velocity (cm/s)	-9	-9	-9							
River Flow (m ³ /s)	393.6	353.6	393.6							
Air Temp (C)	28.0	23.5	31.0							
Water Temp (C)	28.0	27.0	26.5							
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total		Alive	Dead
Jessellated darter	-	-	-	-	-	-	2	-	-	2
Total	-	-	-	-	-	-	2	-	-	2

Table 3.2-36

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 14-15 July 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Jessellated darter	26-31	2 Young	0.5	2
Total			0.5	2

Table 3.2-37

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 26-27 July 1982.

Date	26	27	27							
Time	2000	0400	1200							
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84							
Number of River Water Pumps:										
Nuclear Service	1	1	1							
Secondary Service	1	1	1							
Decay Heat	0	0	0							
Intake Velocity (cm/s)	-7	-7	-7							
River Flow (m ³ /s)	393.1	366.7	356.8							
Air Temp (C)	30.5	27.0	31.0							
Water Temp (C)	29.0	27.0	28.5							
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total		Alive	Dead
Shorthead redhorse	-	1	-	-	-	-	-	-	-	1
Channel catfish	-	1	-	-	-	-	-	-	-	1
Jessellated darter	-	-	-	1	-	-	-	-	-	1
Total	-	2	-	1	-	-	-	-	-	3

Table 3.2-38

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 26-27 July 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Shorthead redhorse	61-65	1 Young	3.8	1
Channel catfish	31-35	1 Young	0.4	1
Jessellated darter	31-35	1 Young	0.2	1
Total			4.4	3

Table 3.2-39

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 12-13 August 1982.

Date	12	13	13							
Time	2000	0400	1200							
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84							
Number of River Water Pumps:										
Nuclear Service	1	1	1							
Secondary Service	1	1	1							
Decay Heat	0	0	0							
Intake Velocity (cm/s)	-5	-5	-5							
River Flow (m ³ /s)	328.9	310.1	303.0							
Air Temp (C)	19.0	17.5	24.5							
Water Temp (C)	22.5	21.0	21.5							
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total		Alive	Dead
Common carp	-	-	-	-	-	-	-	-	-	-
Spottail shiner	-	1	-	-	-	-	1	-	-	2
Yellow bullhead	-	1	-	-	-	-	1	-	-	2
Rock bass	-	3	-	-	-	-	-	-	-	3
Lepomis spp.	-	22	-	10	-	-	7	-	-	39
Total	-	27	-	10	-	-	10	-	-	47

Table 5.2-40

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 12-13 August 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Common carp	41-45	1 Young	1.0	1
Spottail shiner	46-50	2 Young	2.3	2
Yellow bullhead	26-30, 41-45	1 Young	1.7	2
Rock bass	16-25	3 Young	0.7	3
Leoponia spp.	16-30	39 Young	8.2	39
Total			13.9	47

Table 5.2-41

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 25-26 August 1982.

Date	25	26	26					
Time	2000	0400	1700					
Volumetric Flow Rate (m^3/s)	0.84	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	0	0	0					
Intake Velocity (cm/s)	+6	+6	+6					
River flow (m^3/s)	165.0	166.7	167.4					
Air Temp (C)	23.5	17.5	25.0					
Water Temp (C)	25.0	22.5	22.5					
Condition of Fish	Alive Dead		Alive Dead		Total		Total	
Spottail shiner	-	2	-	3	-	-	-	5
Channel catfish	-	-	-	-	1	-	1	-
Rock bass	1	1	-	-	-	-	1	1
Pumpkinseed	-	2	-	12	-	3	-	17
Bluegill	-	3	1	18	-	2	1	23
Total	1	8	1	33	1	5	3	48

Table 5.2-42

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 25-26 August 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	26-35	5 Young	1.2	5
Channel catfish	61-65	1 Young	3.1	1
Rock bass	31-40	2 Young	1.6	2
Pumpkinseed	16-35	17 Young	4.1	17
Bluegill	16-35	24 Young	6.3	24
Total			16.3	49

Table 5.2-43

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 7-8 September 1982.

Date	7	8	8					
Time	2000	0400	1700					
Volumetric Flow Rate (m^3/s)	0.84	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	0	0	0					
Intake Velocity (cm/s)	+4	+4	+4					
River Flow (m^3/s)	143.3	143.3	143.3					
Air Temp (C)	20.0	17.0	20.0					
Water Temp (C)	22.5	21.0	21.0					
Condition of Fish	Alive Dead		Alive Dead		Total		Total	
Rock bass	-	1	-	5	-	-	-	6
Pumpkinseed	-	-	-	-	-	1	-	1
Bluegill	-	-	-	3	-	2	-	5
Total	-	1	-	8	-	3	-	10

Table 5.2-44

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 7-8 September 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Rock bass	31-35, 41-45, 56-60	4 Young	8.0	4
Pumpkinseed	21-25	1 Young	0.3	1
Bluegill	16-35	3 Young	1.6	3
Total			9.9	10

Table 5.2-45

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 21-22 September 1982.

Date	21	22	22					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.33	1.33	1.33					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	1	1	1					
Intake Velocity (cm/s)	3	3	3					
River Flow (m ³ /s)	119.2	110.2	110.2					
Air Temp (C)	18.0	17.0	16.0					
Water Temp (C)	18.5	18.5	17.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Pumpkinseed	-	-	-	-	-	2	-	2
Total	-	-	-	-	-	2	-	2

Table 5.2-46

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 21-22 September 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Pumpkinseed	21-25, 31-35	2 Young	0.9	2
Total			0.9	2

Table 5.2-47

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 12-13 October 1982.

Date	12	13	13					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	0	0	0					
Intake Velocity (cm/s)	3	3	3					
River Flow (m ³ /s)	114.7	114.7	114.7					
Air Temp (C)	16.0	16.0	17.0					
Water Temp (C)	15.0	15.0	15.5					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Redbreast sunfish	-	-	-	1	-	-	-	1
Pumpkinseed	-	1	-	-	-	-	-	1
Total	-	1	-	1	-	-	-	2

Table 5.2-48

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 12-13 October 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Redbreast sunfish	31-35	1 Young	0.8	1
Pumpkinseed	26-30	1 Young	0.4	1
Total			1.2	2

Table 5.2-49

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 25-26 October 1982.

Date	25	26	26					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.33	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	1	0	0					
Intake Velocity (cm/s)	+6	+6	+6					
River Flow (m ³ /s)	119.1	121.1	121.6					
Air Temp (C)	7.5	8.3	16.0					
Water Temp (C)	8.5	9.0	9.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Rock bass	-	-	-	-	1	-	-	1
Total	-	-	-	-	1	-	-	1

Table 5.2-30

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 23-26 October 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Fork Bass	51-55	1 Young	3.0	1
Total			3.0	1

Table 5.2-51

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 9-10 November 1982.

Date	9	10	10		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Decay Heat	0	0	0		
Intake Velocity (cm/s)	NA	NA	NA		
River Flow (m ³ /s)	334.8	340.5	342.6		
Air Temp (C)	14.0	9.0	8.0		
Water Temp (C)	9.5	9.0	9.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Bluegill	-	-	-	-	-
Total	-	-	-	-	-

NA Not Available.

Table 5.2-52

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 9-10 November 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Bluegill	101-105	1 Juvenile	20.8	1
Total			20.8	1

Table 5.2-53

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 23-24 November 1982.

Date	23	24	24		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Decay Heat	0	0	0		
Intake Velocity (cm/s)	NA	NA	NA		
River Flow (m ³ /s)	214.9	226.4	230.7		
Air Temp (C)	16.0	11.5	8.0		
Water Temp (C)	11.0	11.0	10.5		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Bluegill	1	1	-	-	2
Total	1	1	-	-	2

NA Not Available.

Table 5.2-54

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 23-24 November 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Bluegill	31-35	2 Young	0.9	2
Total			0.9	2

Table 5.2-55

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 7-8 December 1981.

Date	7	8	8					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	0.84	0.84	0.84					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Decay Heat	0	0	0					
Intake Velocity (cm/s)	-9	-9	-9					
River Flow (m ³ /s)	492.7	492.7	492.7					
Air Temp (C)	8.0	4.0	10.0					
Water Temp (C)	11.0	9.5	9.5					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Rock bass	-	-	-	-	-	1	-	1
Redbreast sunfish	1	-	-	-	-	2	1	2
Pumpkinseed	-	-	-	-	-	5	-	5
Total	1	-	-	-	-	8	1	8

Table 5.2-56

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 7-8 December 1981.

Species	Fork Length Range (5mm groups)	Reproductive Status	Total Weight (g)	Total Number
Rock bass	46-50	1 Young	2.4	1
Redbreast sunfish	31-35, 41-45	3 Young	3.3	3
Pumpkinseed	26-40	5 Young	2.1	5
Total			7.8	9

Table 5.2-57

Number of fishes impinged at the Unit 1 Intake during a 24-hour impingement survey on 22-23 December 1981.

Date	22	23	23					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	0.46	0.46	0.46					
Number of River Water Pumps:								
Nuclear Service	0	0	0					
Secondary Service	1	1	1					
Decay Heat	0	0	0					
Intake Velocity (cm/s)	-12	-12	-12					
River Flow (m ³ /s)	383.6	562.8	555.0					
Air Temp (C)	4.5	3.5	7.0					
Water Temp (C)	3.0	3.0	3.5					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Spotfin shiner	-	-	-	-	-	-	-	-
Total	-	-	-	-	-	1	-	1

Table 5.2-58

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 1 Intake on 22-23 December 1981.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spotfin shiner	46-50	1 Juvenile	1.1	1
Total			1.1	1

Table 5.2-59

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 26-27 January 1982.

Date	26	27	27					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Intake Velocity (cm/s)	NA	NA	NA					
River Flow (m ³ /s)	1557.4	1557.4	1557.4					
Air Temp (C)	-7.0	-10.0	0.0					
Water Temp (C)	0.0	0.0	0.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Bluegill minnow	-	1	-	-	-	-	-	1
Largehead chum	-	1	-	-	-	-	-	1
Total	-	2	-	-	-	-	-	2

NA Not Available.

Table 5.2-60

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 26-27 January 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Bluntnose minnow	51-55	1 Adult	1.2	1
Margined madtom	51-55	1 Juvenile	1.8	1
Total			3.0	2

Table 5.2-61

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 28-29 January 1982.

Date	28	29	29					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Intake Velocity (cm/s)	NA	NA	NA					
River Flow (m ³ /s)	1691.7	1587.7	1548.9					
Air Temp (C)	-5.0	-11.0	5.0					
Water Temp (C)	0.0	0.0	0.0					
Condition of Fish	Alive Dead		Alive Dead		Total			
<i>Lepomis</i> spp.	-	-	-	1	-	-	-	1
Total	-	-	-	1	-	-	-	1

NA Not Available.

Table 5.2-62

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 28-29 January 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
<i>Lepomis</i> spp.	31-55	1 Young	1.6	1
Total			1.6	1

Table 5.2-63

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 11-12 February 1982.

Date	11	12	12					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Intake Velocity (cm/s)	NA	NA	NA					
River Flow (m ³ /s)	1286.3	1269.3	1262.9					
Air Temp (C)	-4.0	-8.0	0.0					
Water Temp (C)	0.0	0.0	0.0					
Condition of Fish	Alive Dead		Alive Dead		Alive Dead		Total	
Spottail shiner	-	1	-	-	1	-	1	1
Spotfin shiner	-	1	-	-	-	-	-	1
Channel catfish	-	-	-	1	-	-	-	1
Margined madtom	-	1	1	-	1	-	2	1
Rock bass	-	-	-	-	-	1	-	1
Smallmouth bass	-	-	-	-	-	2	-	2
Tessellated darter	-	4	-	1	1	4	1	9
Total	-	7	1	2	3	7	4	16

NA Not Available.

Table 5.2-64

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 11-12 February 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Sta	Total Weight (g)	Total Number
Spottail shiner	86-95	2 Adult	18.0	2
Spotfin shiner	31-35	1 Young	0.3	1
Channel catfish	56-60	1 Young	2.1	1
Margined madtom	81-90, 116-120	2 Juvenile, 1 Adult	31.3	3
Rock bass	41-45	1 Young	1.9	1
Smallmouth bass	81-85, 131-135	2 Young	53.3	2
Tessellated darter	41-55, 61-65	5 Juvenile, 5 Adult	11.5	10
Total			118.4	20

Table 5.2-63

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 24-25 February 1982.

Date	24	25	25					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Intake Velocity (cm/s)	NA	NA	NA					
River Flow (m ³ /s)	1236.9	1233.2	1231.8					
Air Temp (C)	-1.0	-6.0	-2.0					
Water Temp (C)	1.5	1.0	1.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Spottail shiner	-	-	-	-	1	-	1	1
Rock bass	-	1	-	-	1	-	1	1
Tessellated darter	-	-	-	-	1	-	1	1
Total	-	1	-	-	1	2	1	3

NA Not Available.

Table 5.1-66

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 24-25 February 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	51-55	1 Young	1.5	1
Rock bass	126-130	2 Juvenile	49.9	2
Tessellated darter	56-60	1 Adult	1.5	1
Total			52.9	4

Table 5.2-67

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 17-18 March 1982.

Date	17	18	18					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Intake Velocity (cm/s)	NA	NA	NA					
River Flow (m ³ /s)	3695.3	3581.7	3539.6					
Air Temp (C)	6.0	4.0	8.0					
Water Temp (C)	3.0	1.0	2.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Spottail shiner	-	-	-	-	1	-	1	1
Channel catfish	-	1	-	2	-	-	2	3
Tessellated darter	-	1	-	1	-	-	1	2
Total	-	2	-	3	-	1	4	6

NA Not Available.

Table 5.2-68

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 17-18 March 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	81-85	1 Adult	6.5	1
Channel catfish	41-45, 66-70	3 Young	10.2	3
Tessellated darter	46-50	2 Juvenile	1.7	2
Total			18.4	6

Table 5.2-69

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 30-31 March 1982.

Date	30	31	31		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Intake Velocity (cm/s)	+5	+5	+5		
River Flow (m ³ /s)	2413.0	2258.2	2200.2		
Air Temp (C)	12.0	11.0	14.0		
Water Temp (C)	5.5	5.5	6.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	2	-	-	2
Spotfin shiner	-	-	-	-	-
Channel catfish	-	-	-	-	-
Margined madtom	-	-	1	-	1
Rock bass	1	-	-	-	1
Jessellated darter	-	1	-	2	3
Total	1	3	1	2	6

Table 5.2-70

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 30-31 March 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	66-70, 86-90, 96-100	3 Adult	21.0	3
Spotfin shiner	26-30	1 Young	0.1	1
Channel catfish	41-45	1 Young	0.9	1
Margined madtom	36-40	1 Young	0.6	1
Rock bass	101-105	1 Juvenile	31.8	1
Jessellated darter	41-55	2 Juvenile, 1 Adult	6.8	3
Total			61.2	10

Table 5.2-71

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 15-16 April 1982.

Date	15	16	16		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Intake Velocity (cm/s)	+20	+20	+20		
River Flow (m ³ /s)	1651.3	1632.5	1625.4		
Air Temp (C)	15.0	9.5	20.0		
Water Temp (C)	9.5	9.0	10.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	-	-	-	-
Margined madtom	-	-	1	-	1
Rock bass	-	-	1	1	2
Pumpkinseed	-	1	-	-	1
Jessellated darter	-	-	-	3	3
Total	-	1	2	2	5

Table 5.2-72

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 15-16 April 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	91-95	1 Adult	9.8	1
Margined madtom	76-80	1 Juvenile	3.7	1
Rock bass	66-70, 121-125	1 Young, 1 Juvenile	45.0	2
Pumpkinseed	31-35	1 Young	0.7	1
Jessellated darter	46-55	3 Juvenile, 1 Adult	4.2	4
Total			63.4	9

Table 5.2-73

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 27-28 April 1982.

Date	27	28	28				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Intake Velocity (cm/s)	-9	-9	-9				
River Flow (m ³ /s)	966.1	969.9	971.3				
Air Temp (C)	13.5	13.0	18.0				
Water Temp (C)	14.5	14.0	13.2				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Rock bass	1	-	2	1	-	1	5
Tessellated darter	-	-	-	-	-	1	1
Total	1	-	2	1	-	2	3

Table 5.2-74

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 27-28 April 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Rock bass	91-95, 106-120, 171-175	4 Juvenile, 1 Adult	257.8	5
Tessellated darter	41-45	1 Juvenile	1.0	1
Total			258.8	6

Table 5.2-75

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 6-7 May 1982.

Date	6	7	7				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Intake Velocity (cm/s)	-5	-5	-5				
River Flow (m ³ /s)	541.8	524.6	518.2				
Air Temp (C)	22.0	16.0	25.5				
Water Temp (C)	19.0	19.0	19.0				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Mimic shiner	-	1	-	-	-	-	1
Channel catfish	-	2	-	-	-	-	2
Rock bass	-	1	-	-	-	1	2
White crappie	-	-	-	1	-	-	1
Total	-	4	-	1	-	1	6

Table 5.2-76

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 6-7 May 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Mimic shiner	36-40	1 Juvenile	0.6	1
Channel catfish	161-165	2 Juvenile	123.4	2
Rock bass	56-60, 121-125	1 Young, 1 Juvenile	56.6	2
White crappie	91-95	1 Juvenile	9.5	1
Total			190.0	6

Table 5.2-77

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 13-14 May 1982.

Date	13	14	14				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Intake Velocity (cm/s)	-14	-14	-14				
River Flow (m ³ /s)	580.0	553.6	543.7				
Air Temp (C)	23.0	17.0	25.0				
Water Temp (C)	22.3	21.0	21.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Channel catfish	1	-	-	-	-	-	1
Rock bass	-	-	-	-	-	-	-
Total	1	-	-	-	-	-	1

Table 5.2-78

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 13-14 May 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Channel catfish	241-245	1 Juvenile	213.0	1
Rock bass	131-135	1 Juvenile	53.6	1
Total			266.6	2

Table 5.2-79

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 18-19 May 1982.

Date	18	19	19	
Time	2000	0400	1200	* **
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58	
Number of River Water Pumps:				
Nuclear Service	1	1	1	
Secondary Service	1	1	1	
Intake Velocity (cm/s)	-6	-6	-6	
River Flow (m ³ /s)	401.4	395.7	393.6	
Air Temp (C)	24.0	19.0	25.5	
Water Temp (C)	24.0	23.0	23.5	
Condition of Fish	Alive Dead	Alive Dead	Alive Dead	Total
Margined madtom	-	-	-	-
Total	-	-	-	-

Table 5.2-80

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 18-19 May 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Margined madtom	131-135	1 Adult	19.8	1
Total			19.8	1

Table 5.2-81

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 27-28 May 1982.

Date	27	28	28	
Time	2000	0400	1200	
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58	
Number of River Water Pumps:				
Nuclear Service	1	1	1	
Secondary Service	1	1	1	
Intake Velocity (cm/s)	-8	-8	-8	
River Flow (m ³ /s)	931.2	904.7	894.8	
Air Temp (C)	22.0	20.0	17.0	
Water Temp (C)	21.0	20.0	20.0	
Condition of Fish	Alive Dead	Alive Dead	Alive Dead	Total
Spotfin shiner	-	-	-	-
Total	-	-	-	-

Table 5.2-82

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 27-28 May 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spotfin shiner	41-45	1 Juvenile	0.8	1
Total			0.8	1

Table 5.2-83

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 3-4 June 1982.

Date	3		4		4	
Time	2000		0400		1200	
Volumetric Flow Rate (m ³ /s)	1.58		1.58		2.09	
Number of River Water Pumps:						
Nuclear Service	1		1		1	
Secondary Service	1		1		2	
Intake Velocity (cm/s)	-21		-21		-21	
River Flow (m ³ /s)	1445.3		1477.4		1489.5	
Air Temp (C)	17.0		15.5		17.5	
Water Temp (C)	21.0		21.0		19.0	
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead
Bluntnose minnow	-	-	1	-	1	-
White sucker	-	-	-	-	-	1
Tessellated darter	-	-	-	-	1	1
Total	-	-	1	-	1	2

Table 5.2-84

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 3-4 June 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Bluntnose minnow	56-65	2 Adult	5.6	2
White sucker	21-25	1 Young	0.1	1
Tessellated darter	51-55	1 Adult	1.2	1
Total			6.9	4

Table 5.2-85

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 9-10 June 1982.

Date	9		10		10	
Time	2000		0400		1200	
Volumetric Flow Rate (m ³ /s)	2.09		2.09		2.09	
Number of River Water Pumps:						
Nuclear Service	1		1		1	
Secondary Service	2		2		2	
Intake Velocity (cm/s)	12		12		12	
River Flow (m ³ /s)	3164.4		2881.3		2775.1	
Air Temp (C)	22.5		17.5		17.5	
Water Temp (C)	17.5		17.5		17.5	
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead
White sucker	-	-	-	-	-	1
Total	-	-	-	1	-	1

Table 5.2-86

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 9-10 June 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
White sucker	101-105	1 Juvenile	17.2	1
Total			17.2	1

Table 5.2-87

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 17-18 June 1982.

Date	17		18		18	
Time	2000		0400		1200	
Volumetric Flow Rate (m ³ /s)	1.58		1.58		1.58	
Number of River Water Pumps:						
Nuclear Service	1		1		1	
Secondary Service	1		1		1	
Intake Velocity (cm/s)	-9		-9		-9	
River Flow (m ³ /s)	1571.6		1571.6		1571.6	
Air Temp (C)	24.0		20.0		27.5	
Water Temp (C)	21.0		21.0		21.0	
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead
Quillback	-	-	-	1	-	-
Pumpkinseed	-	1	-	-	-	1
Total	-	1	-	1	-	2

Table 5.2-88

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 17-18 June 1981.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Gullbait	316-520	1 Adult	2041.0	1
Pumpkinseed	146-150	1 Adult	80.0	1
Total			2121.0	2

Table 5.2-89

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 23-24 June 1982.

Date	23	24	24				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Intake Velocity (cm/s)	-7	-7	-7				
River Flow (m ³ /s)	881.3	841.7	826.8				
Air Temp (C)	23.0	21.0	27.5				
Water Temp (C)	22.0	16.5	22.0				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Rock Bass	-	-	-	-	-	-	-
Total	-	-	-	-	-	-	-

Table 5.2-90

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 23-24 June 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Rock Bass	141-145	1 Juvenile	99.7	1
Total			99.7	1

Table 5.2-91

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 29-30 June 1982.

Date	29	30	30				
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Intake Velocity (cm/s)	-15	-15	-15				
River Flow (m ³ /s)	613.6	606.0	603.2				
Air Temp (C)	24.0	24.0	22.0				
Water Temp (C)	23.5	24.0	23.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	-	-	-	-	-	-
Spotfin shiner	-	2	-	-	-	-	2
Tessellated darter	-	-	-	6	-	-	6
Total	-	2	-	6	-	-	8

Table 5.3-92

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 29-30 June 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	26-30, 86-90	1 Young, 1 Adult	6.6	2
Spotfin shiner	56-65	1 Juvenile, 1 Adult	4.3	2
Tessellated darter	21-35	11 Young	2.4	11
Total			13.3	15

Table 5.2-93

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 14-15 July 1982.

Date	14	15	15		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Intake Velocity (cm/s)	-10	-10	-10		
River Flow (m ³ /s)	393.6	393.6	393.6		
Air Temp (C)	27.5	24.5	30.0		
Water Temp (C)	28.0	26.5	27.5		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Total			NO FISH TAKEN		

Table 5.2-94

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 14-15 July 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Total		NO FISH TAKEN		

Table 5.2-95

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 26-27 July 1982.

Date	26	27	27		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Intake Velocity (cm/s)	-5	-5	-5		
River Flow (m ³ /s)	393.1	366.7	356.8		
Air Temp (C)	31.0	27.5	32.0		
Water Temp (C)	29.0	28.5	29.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	1	-	-	1
Channel catfish	-	5	-	4	11
Margined madtom	-	-	-	1	1
Rock bass	-	-	-	1	1
Tessellated darter	-	1	-	1	2
Total	-	7	-	6	16

Table 5.2-96

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 26-27 July 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	41-45	1 Young	0.7	1
Channel catfish	26-45, 181-185	10 Young, 1 Juvenile	77.0	11
Margined madtom	31-35	1 Young	0.5	1
Rock bass	16-20	1 Young	0.1	1
Tessellated darter	36-40	2 Young	1.0	2
Total			79.3	16

Table 5.2-97

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 12-13 August 1982.

Date	12	13	13		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Intake Velocity (cm/s)	-3	-3	-3		
River Flow (m ³ /s)	328.9	310.1	303.0		
Air Temp (C)	19.0	18.0	25.0		
Water Temp (C)	22.0	21.5	22.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Common carp	-	-	-	2	3
Spotfin shiner	-	1	-	2	3
Yellow perch	-	-	-	3	3
Channel catfish	-	-	-	1	1
Lepomis spp.	-	2	-	3	7
Tessellated darter	-	1	-	1	2
Total	-	4	-	8	19

Table 5.2-98

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 12-13 August 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight		Total Number	
			(g)	(#)	(#)	(#)
Common carp	31-35, 41-45, 51-55	2 Young	4.2	2	2	2
Spotfin shiner	21-25, 46-50, 61-65	1 Young, 1 Juvenile, 1 Adult	1.8	3	3	3
Yellow bullhead	21-25, 36-45	3 Young	2.5	3	3	3
Channel catfish	51-55	1 Young	1.2	1	1	1
Lepomis spp.	16-30	2 Young	1.5	2	2	2
Tessellated darter	36-45	1 Young, 1 Juvenile	1.2	2	2	2
Total			13.1	19	19	19

Table 5.2-99

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 25-26 August 1982.

Date	25		26		26					
	Time		Time		Time					
	2000		0400		1200					
Volumetric Flow Rate (m ³ /s)	1.58		1.58		1.58					
Number of River Water Pumps:										
Nuclear Service	1		1		1					
Secondary Service	1		1		1					
Intake Velocity (cm/s)	-2		-2		-2					
River Flow (m ³ /s)	165.0		166.7		167.4					
Air Temp (C)	23.5		17.5		29.5					
Water Temp (C)	25.0		22.5		25.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Spottail shiner	-	-	-	-	-	-	-	-	-	-
Spotfin shiner	-	-	-	1	-	1	-	-	-	1
Yellow bullhead	-	-	-	1	-	-	-	-	-	1
Channel catfish	-	1	-	1	-	-	-	-	-	1
Margined madtom	-	-	-	2	-	-	-	-	-	2
Pumpkinseed	-	2	-	-	-	-	-	-	-	2
Tessellated darter	-	1	-	1	-	-	-	-	-	2
Total	-	4	-	7	-	1	-	-	-	10

Table 5.2-100

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 25-26 August 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight		Total Number	
			(g)	(#)	(#)	(#)
Spottail shiner	21-30	2 Young	0.3	2	2	2
Spotfin shiner	51-55	1 Juvenile	2.1	1	1	1
Yellow bullhead	71-75	1 Juvenile	5.6	1	1	1
Channel catfish	51-55, 61-65	2 Young	9.1	2	2	2
Margined madtom	36-40, 46-50	2 Young	1.7	2	2	2
Pumpkinseed	26-35	2 Young	1.0	2	2	2
Tessellated darter	46-50	1 Juvenile	1.9	1	1	1
Total			17.7	12	12	12

Table 5.2-101

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 7-8 September 1982.

Date	7		8		8					
	Time		Time		Time					
	2000		0400		1200					
Volumetric Flow Rate (m ³ /s)	1.58		1.58		1.58					
Number of River Water Pumps:										
Nuclear Service	1		1		1					
Secondary Service	1		1		1					
Intake Velocity (cm/s)	5		5		5					
River Flow (m ³ /s)	143.3		143.3		143.3					
Air Temp (C)	20.0		16.5		20.0					
Water Temp (C)	22.5		21.0		21.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Spotfin shiner	-	-	-	3	-	-	-	-	-	3
Margined madtom	-	-	-	1	-	-	-	-	-	1
Rock bass	-	1	-	-	-	-	-	-	-	1
Pumpkinseed	-	1	-	1	-	-	-	-	-	2
Total	-	2	-	5	-	-	-	-	-	7

Table 5.2-102

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 7-8 September 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spotfin shiner	41-45, 41-45, 76-80	1 Juvenile, 2 Adult	10.0	3
Margined madtom	51-55	1 Juvenile	1.6	1
Rock bass	36-40	1 Young	1.2	1
Pumpkinseed	26-30, 41-45	2 Young	1.8	2
Total			14.6	7

Table 5.2-103

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 21-22 September 1982.

Date	21	22	22	Total			
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Intake Velocity (cm/s)	3	3	3				
River Flow (m ³ /s)	110.2	110.2	110.2				
Air Temp (C)	18.0	17.0	14.5				
Water Temp (C)	18.5	16.5	17.0				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	
Mimic shiner	-	1	-	-	-	1	
Rock bass	-	-	1	-	-	-	1
Tessellated darter	-	1	-	-	-	-	1
Total	-	2	-	1	-	-	3

Table 5.2-104

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 21-22 September 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Mimic shiner	21-25	1 Young	0.2	1
Rock bass	201-205	1 Adult	83.0	1
Tessellated darter	41-45	1 Juvenile	0.7	1
Total			83.9	3

Table 5.2-105

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 12-13 October 1982.

Date	12	13	13	Total			
Time	2000	0400	1200				
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Intake Velocity (cm/s)	2	2	2				
River Flow (m ³ /s)	114.7	114.7	114.7				
Air Temp (C)	16.0	16.0	13.0				
Water Temp (C)	15.0	15.0	15.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	
Rock bass	-	-	-	1	-	-	1
Redbreast sunfish	-	-	1	-	-	-	1
Bluegill	-	-	1	-	-	-	1
Tessellated darter	-	-	1	-	-	-	1
Total	-	-	3	-	1	-	4

Table 5.2-106

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 12-13 October 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Rock bass	36-40	1 Young	1.1	1
Redbreast sunfish	31-35	1 Young	0.7	1
Bluegill	46-50	1 Juvenile	2.1	1
Tessellated darter	41-45	1 Juvenile	0.6	1
Total			4.5	4

Table 5.2-107

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 25-26 October 1982.

Date	25	26	26		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Intake Velocity (cm/s)	~4	~4	~4		
River Flow (m ³ /s)	119.1	121.1	121.8		
Air Temp (C)	7.5	8.5	17.0		
Water Temp (C)	8.5	8.5	9.0		
Condition of Fish	Alive	Dead	Alive	Dead	Total
Spottail shiner	-	-	-	2	2
Spotfin shiner	-	-	-	2	4
Channel catfish	-	-	-	1	1
Margined madtom	-	-	1	-	1
Redbreast sunfish	-	2	1	4	9
Pumpkinseed	-	2	4	6	12
Tessellated darter	-	-	-	2	2
Banded darter	-	-	-	1	1
Total	-	6	6	20	32

Table 5.2-108

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 25-26 October 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	31-35, 36-40	1 Young, 1 Adult	3.9	2
Spotfin shiner	26-30, 36-40, 51-55	3 Young, 1 Juvenile	2.9	4
Channel catfish	37-55	1 Young	1.5	1
Margined madtom	56-60	1 Juvenile	1.5	1
Redbreast sunfish	26-40, 46-50	6 Young, 1 Juvenile	8.9	9
Pumpkinseed	21-25, 41-45	13 Young	6.4	13
Tessellated darter	46-55	1 Juvenile, 1 Adult	2.6	2
Banded darter	36-40	1 Juvenile	0.5	1
Total			28.2	33

Table 5.2-109

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 9-10 November 1982.

Date	9	10	10		
Time	2000	0400	1200		
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58		
Number of River Water Pumps:					
Nuclear Service	1	1	1		
Secondary Service	1	1	1		
Intake Velocity (cm/s)	NA	NA	NA		
River Flow (m ³ /s)	334.8	340.5	342.6		
Air Temp (C)	14.0	9.0	9.0		
Water Temp (C)	9.0	8.0	9.0		
Condition of fish	Alive	Dead	Alive	Dead	Total
Spotfin shiner	-	1	-	-	1
Bluntnose minnow	-	1	-	-	1
Redbreast sunfish	-	1	1	1	3
Pumpkinseed	-	-	-	2	2
Bluegill	-	-	-	1	1
Total	-	3	3	3	8

NA Not Available.

Table 5.2-110

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 9-10 November 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spotfin shiner	26-30	1 Young	0.2	1
Bluntnose minnow	36-40	1 Juvenile	0.6	1
Redbreast sunfish	26-35, 41-50	3 Young, 1 Juvenile	5.3	4
Pumpkinseed	41-45, 51-55	2 Young	4.6	2
Bluegill	46-50	1 Juvenile	1.9	1
Total			12.6	9

Table 3.2-111

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 23-24 November 1982.

Date	23	24	24					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Intake Velocity (cm/s)	NA	NA	NA					
River Flow (m ³ /s)	214.9	226.4	230.7					
Air Temp (C)	16.5	12.0	8.5					
Water Temp (C)	11.0	11.5	11.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Spotfin shiner	-	-	-	-	-	1	-	1
Redbreast sunfish	-	3	-	-	-	2	-	5
Green sunfish	1	-	-	-	-	-	1	1
Bluegill	-	-	-	-	-	2	-	2
Total	1	3	-	-	-	5	1	6

NA Not Available.

Table 3.2-112

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 23-24 November 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spotfin shiner	41-45	1 Juvenile	0.7	1
Redbreast sunfish	36-40	3 Young	6.2	3
Green sunfish	46-50	1 Young	1.8	1
Bluegill	26-30, 41-45	2 Young	1.7	2
Total			10.4	7

Table 3.2-113

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 7-8 December 1982.

Date	7	8	8					
Time	2000	0400	1200					
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58					
Number of River Water Pumps:								
Nuclear Service	1	1	1					
Secondary Service	1	1	1					
Intake Velocity (cm/s)	-4	-4	-4					
River Flow (m ³ /s)	492.7	492.7	492.7					
Air Temp (C)	7.5	3.3	10.0					
Water Temp (C)	11.0	9.0	10.0					
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Total	
Channel catfish	-	-	-	-	-	-	-	1
Redbreast sunfish	1	2	-	-	-	-	1	2
Green sunfish	-	-	-	1	-	-	-	1
Lepomis spp.	-	3	-	-	-	-	-	3
Total	1	5	-	1	-	-	1	7

Table 3.2-114

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 7-8 December 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Channel catfish	51-55	1 Young	1.5	1
Redbreast sunfish	31-40, 176-180	2 Young, 1 Adult	123.2	3
Green sunfish	41-45	1 Young	1.3	1
Lepomis spp.	31-40	3 Young	2.4	3
Total			128.6	6

Table 5.2-115

Number of fishes impinged at the Unit 2 Intake during a 24-hour impingement survey on 22-23 December 1982.

Time	22	23	23	Total			
Time	2000	0600	1200				
Volumetric Flow Rate (m ³ /s)	1.58	1.58	1.58				
Number of River Water Pumps:							
Nuclear Service	1	1	1				
Secondary Service	1	1	1				
Intake Velocity (cm/s)	-9	-9	-9				
River Flow (m ³ /s)	583.8	542.8	555.0				
Air Temp (°C)	4.0	3.0	1.0				
Water Temp (°C)	3.0	3.0	3.5				
Condition of Fish	Alive	Dead	Alive	Dead	Alive	Dead	Alive
Spottail shiner	-	1	-	-	-	-	-
Channel catfish	-	-	-	-	-	1	-
Bluegill	-	1	-	-	-	1	-
Leopold's spp	-	1	-	-	-	-	-
Tessellated darter	-	1	-	-	-	1	-
Total	-	3	-	-	-	3	-

Table 5.2-116

Summary of length, weight, reproductive status, and number of fishes impinged at the Unit 2 Intake on 22-23 December 1982.

Species	Fork Length Range (5 mm groups)	Reproductive Status	Total Weight (g)	Total Number
Spottail shiner	71-75	1 Adult	4.8	1
Channel catfish	41-45	1 Young	1.2	1
Bluegill	31-40	2 Young	1.7	2
Leopold's spp.	26-30	1 Young	0.5	1
Tessellated darter	36-40, 46-50	1 Young, 1 Juvenile	1.5	2
Total			9.7	7

Table 3.2-115

Summary of impingement data from 24-hour surveys at TM1'S Unit 1 Intake, January through December 1982.

Month (Number of surveys)	Jan (2)		Feb (2)		Mar (2)		Apr (2)		May (4)		Jun (5)		Jul (2)		Aug (2)		
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	
Common carp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Spottail shiner	-	1	-	-	-	-	-	3	-	-	-	1	-	-	-	-	2
Spotfin shiner	-	-	1	71	1	-	-	-	-	-	3	-	-	-	-	-	-
Fallfish	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quillback	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
White sucker	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	8	-	1	-	-	-	-
Yellow bullhead	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	2
Channel catfish	-	-	-	2	4	-	-	-	-	-	-	-	1	-	1	-	-
Rock bass	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	1	4
Redbreast sunfish	-	-	2	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	-	-	2	8	1	2	-	-	-	-	2	1	-	-	-	-	17
Bluegill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	23
Lepomis spp.	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	39
Smallmouth bass	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Tessellated darter	-	-	11	11	9	2	2	-	-	-	7	-	-	3	-	-	-
Subtotal	-	1	19	91	12	4	2	-	2	-	2	17	-	5	5	3	93
Total	-	1	19	91	12	4	2	-	2	-	2	17	-	5	5	3	93
Total Weight (g)	-	6.8	187.3	169.1	21.6	36.1	514.6	4.9	30.2	-	10.8	4.2	-	21.7	8.9	1016.4	-

Table 3.2-117 continued.

Month (Number of surveys)	Sep (2)		Oct (2)		Nov (2)		Dec (2)		Subtotal	Total (2g)	Percent Composition
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead			
Common carp	-	-	-	-	-	-	-	-	1	1	0.3
Spottail shiner	-	-	-	-	-	-	-	-	12	12	4.2
Spotfin shiner	-	-	-	-	-	-	1	-	2	77	26.7
Fallfish	-	-	-	-	-	-	-	-	1	1	0.3
Quillback	-	-	-	-	-	-	-	-	1	1	0.3
White sucker	-	-	-	-	-	-	-	-	2	2	0.7
Shorthead redhorse	-	-	-	-	-	-	-	-	1	1	0.3
Yellow bullhead	-	-	-	-	-	-	-	-	4	5	1.7
Channel catfish	-	-	-	-	-	-	-	-	6	9	3.1
Rock bass	-	4	-	1	-	-	-	1	5	15	5.2
Redbreast sunfish	-	-	-	1	-	-	1	2	3	8	2.8
Pumpkinseed	-	3	-	1	-	-	5	-	3	42	14.6
Bluegill	-	5	-	-	2	1	-	-	3	32	11.1
Lepomis spp.	-	-	-	-	-	-	-	-	-	41	14.2
Smallmouth bass	-	-	-	-	-	-	-	-	1	1	0.3
Tessellated darter	-	-	-	-	-	-	-	-	17	23	8.0
Subtotal	-	12	-	3	2	1	1	9	43	245	86.9
Total	-	12	-	3	2	1	1	9	43	245	86.9
Total Weight (g)	-	10.8	-	4.2	21.7	8.9	-	-	1016.4	-	-

Table 3.2-118

Summary of biomass (g) data from 24-hour impingement surveys at TM1NS Unit 1 Intake, January through December 1982.

Month (Number of surveys)	Jan (2)	Feb (2)	Mar (2)	Apr (2)	May (4)	Jun (5)	Jul (2)	Aug (2)	Sep (2)	Oct (2)	Nov (2)	Dec (2)	Total (2g)	Percent Composition
Common carp	-	-	-	-	-	-	-	1.0	-	-	-	-	1.0	0.1
Spottail shiner	6.8	-	-	19.5	-	0.1	-	3.5	-	-	-	-	29.9	2.9
Spotfin shiner	-	35.5	3.5	-	-	1.2	-	-	-	-	-	1.1	41.3	4.1
Fallfish	-	4.2	-	-	-	-	-	-	-	-	-	-	4.2	0.4
Quillback	-	-	-	-	-	315.0	-	-	-	-	-	-	315.0	31.0
White sucker	-	-	-	-	-	0.8	-	-	-	-	-	-	0.8	0.1
Shorthead redhorse	-	-	-	-	-	-	3.8	-	-	-	-	-	3.8	0.4
Yellow bullhead	-	-	-	-	20.6	121.5	-	1.7	-	-	-	-	143.8	14.1
Channel catfish	-	3.6	11.2	-	15.5	-	0.4	3.1	-	-	-	-	33.8	3.3
Rock bass	-	11.3	101.7	-	-	-	-	2.3	8.0	3.0	-	2.4	128.7	12.7
Redbreast sunfish	-	3.8	-	-	-	-	-	-	-	0.8	-	3.3	7.9	0.8
Pumpkinseed	-	99.4	46.4	-	-	74.7	-	4.1	1.2	0.1	-	2.1	228.3	22.5
Bluegill	-	-	-	-	-	-	-	6.3	1.6	-	21.7	-	29.6	2.9
Lepomis spp.	-	0.6	-	-	-	-	-	8.2	-	-	-	-	8.8	0.9
Smallmouth bass	-	8.6	-	-	-	-	-	-	-	-	-	-	8.6	0.8
Tessellated darter	-	20.2	6.3	2.1	-	1.3	0.7	-	-	-	-	-	30.9	3.0
Total Weight (g)	6.8	187.3	169.1	21.6	36.1	514.6	4.9	30.2	10.8	4.2	21.7	8.9	1016.4	-

Table 5.2-118

Summary of Impingement Data from 24-hour surveys at TMINS Unit 2 Intake, January through December 1982.

Month (Number of surveys)	Jan (2)		Feb (2)		Mar (2)		Apr (2)		May (4)		Jun (5)		Jul (2)		Aug (2)	
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead
Common carp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spottail shiner	-	-	1	2	-	4	-	1	-	-	-	2	-	1	-	2
Spotfin shiner	-	-	-	1	-	1	-	-	-	1	-	2	-	-	-	4
Mimic shiner	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Bluntnose minnow	-	1	-	-	-	-	-	-	-	-	2	-	-	-	-	-
Quillback	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
White sucker	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
Yellow bullhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Channel catfish	-	-	-	1	-	4	-	-	1	2	-	-	-	11	-	3
Margined madtom	-	1	2	1	1	-	1	-	1	-	1	-	-	1	-	2
Rock bass	-	-	1	2	1	-	2	2	3	-	1	-	1	-	-	4
Redbreast sunfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	2
Bluegill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lepomis spp.	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	2
Smallmouth bass	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-
White crappie	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Telescope darter	-	-	1	10	-	4	3	2	-	-	-	12	-	2	-	4
Banded darter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	-	3	3	19	2	17	6	7	1	4	2	21	-	14	-	31
Total	-	3	3	24	2	19	13	7	1	10	2	23	-	16	-	31
Total Weight (g)	-	4.6	171.3	79.6	322.2	477.2	2258.1	79.3	32.8	-	-	-	-	-	-	-

Table 5.2-119 continued.

Month (Number of surveys)	Sep (2)		Oct (2)		Nov (2)		Dec (2)		Subtotal		Total (29)	Percent Composition
	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead	Alive	Dead		
Common carp	-	-	-	-	-	-	-	-	-	3	3	1.4
Spottail shiner	-	-	-	2	-	-	-	1	1	15	16	7.2
Spotfin shiner	-	3	-	4	-	2	-	-	-	18	18	8.1
Mimic shiner	-	1	-	-	-	-	-	-	-	2	2	0.9
Bluntnose minnow	-	-	-	-	-	1	-	-	-	2	2	1.0
Quillback	-	-	-	-	-	-	-	-	-	1	1	0.4
White sucker	-	-	-	-	-	-	-	-	-	2	2	0.9
Yellow bullhead	-	-	-	-	-	-	-	-	-	4	4	1.8
Channel catfish	-	-	-	1	-	-	-	2	1	24	25	11.3
Margined madtom	-	1	-	1	-	-	-	-	4	8	12	5.4
Rock bass	-	2	-	1	-	-	-	-	6	13	19	8.6
Redbreast sunfish	-	-	-	10	1	4	1	2	2	20	22	10.0
Green sunfish	-	-	-	-	1	-	1	-	1	1	2	0.9
Pumpkinseed	-	2	1	12	-	2	-	-	1	20	21	9.5
Bluegill	-	-	-	1	-	3	2	2	-	6	6	2.7
Lepomis spp.	-	-	-	-	-	-	-	4	-	12	12	5.4
Smallmouth bass	-	-	-	-	-	-	-	-	-	2	2	0.9
White crappie	-	-	-	-	-	-	-	-	-	1	1	0.4
Telescope darter	-	1	-	3	-	-	-	2	4	44	48	21.7
Banded darter	-	-	-	1	-	-	-	-	-	1	1	0.4
Subtotal	-	10	1	36	2	16	1	14	21	199	221	100
Total	-	10	1	36	2	16	1	14	21	199	221	100
Total Weight (g)	-	99.1	32.7	23.0	138.3	138.3	3718.2	-	-	-	-	-

Table 5.2-120

Summary of Biomass (g) data from 24-hour impingement surveys at TMINS Unit 2 Intake, January through December 1982.

Month (Number of surveys)	Jan (2)	Feb (2)	Mar (2)	Apr (2)	May (4)	Jun (5)	Jul (2)	Aug (2)	Sep (2)	Oct (2)	Nov (2)	Dec (2)	Total (29)	Percent Composition
Common carp	-	-	-	-	-	-	-	4.2	-	-	-	-	4.2	0.1
Spottail shiner	-	19.5	27.5	9.8	-	6.6	0.7	0.3	-	3.9	-	4.8	73.1	2.0
Spotfin shiner	-	0.3	0.1	-	0.8	4.1	-	3.9	10.0	2.9	0.9	-	25.2	0.7
Mimic shiner	-	-	-	-	0.6	-	-	-	0.2	-	-	-	0.8	+
Bluntnose minnow	1.2	-	-	-	-	5.6	-	-	-	-	0.6	-	7.4	0.2
Quillback	-	-	-	-	-	2041.0	-	-	-	-	-	-	2041.0	54.9
White sucker	-	-	-	-	-	17.3	-	-	-	-	-	-	17.3	0.5
Yellow bullhead	-	-	-	-	-	-	-	8.1	-	-	-	-	8.1	0.2
Channel catfish	-	2.1	11.1	-	336.4	-	77.0	7.0	-	1.5	-	2.7	437.8	11.8
Margined madtom	1.8	31.3	0.6	3.7	19.8	-	0.5	1.7	1.6	1.5	-	-	62.5	1.7
Rock bass	-	51.8	31.8	302.8	110.2	99.7	0.1	-	84.2	1.2	-	-	681.7	18.3
Redbreast sunfish	-	-	-	-	-	-	-	-	-	9.6	11.5	123.2	114.3	3.9
Green sunfish	-	-	-	-	-	-	-	-	-	-	1.8	1.5	3.3	0.1
Pumpkinseed	-	-	-	0.7	-	80.0	-	1.0	2.4	6.4	4.6	-	95.1	2.6
Bluegill	-	-	-	-	-	-	-	-	-	2.1	3.6	1.7	7.4	0.2
Lepomis spp.	1.4	-	-	-	-	-	-	1.5	-	-	-	2.9	6.0	0.2
Smallmouth bass	-	53.3	-	-	-	-	-	-	-	-	-	-	53.3	1.4
White crappie	-	-	-	-	9.4	-	-	-	-	-	-	-	9.4	0.2
Telescope darter	-	13.0	8.5	5.2	-	3.6	1.0	3.1	0.7	3.2	-	1.5	39.8	1.1
Banded darter	-	-	-	-	-	-	-	-	-	6.5	-	-	6.5	+
Total Weight (g)	4.6	171.3	79.6	322.2	477.2	2258.1	79.3	32.8	99.1	32.7	23.0	138.3	3718.2	100

+ Less than 0.05%.

Table 5.2-121

Results of the one factor analysis of variance test for numbers of fish impinged during three sample periods (2000, 0400, and 1200 h) at TMINS Units 1 and 2, 1982.

1982 Unit 1	Source of Variation	df	SS	MS	F
	Sample periods	2	198.50	99.25	0.42NS*
	Error	33	7825.50	237.14	
	Total	35	8024.00		
1982 Unit 2	Source of Variation	df	SS	MS	F
	Sample periods	2	11.06	5.53	0.28NS*
	Error	33	663.25	20.10	
	Total	35	674.31		

* Not significant at $P \leq 0.05$.

Table 5.2-122

Results of the nonparametric binomial test on numbers of alive and dead fish impinged by TMINS, 1974 through 1982. Data from Units I and II are treated as separate years, 1978 through 1982.

Year	Total Fish Impinged	Total Fish Alive	Total Fish Dead
1974I	1222	153	1069*
1975I	476	121	355*
1976I	685	110	575*
1977I	3159	179	3180*
1978I	193	93	100
1978II	525	47	478*
1979I	285	141	144
1979II	351	42	309*
1980I	271	72	199*
1980II	255	57	198*
1981I	405	132	273*
1981II	639	50	589*
1982I	288	43	245*
1982II	221	22	199*

* Significant at $P = 0.05$.

Table 5.2-123

Kendall's tau correlation coefficients for fish numbers and biomass from seine Stations 16A1 and 10A2, electrofishing Zone 13A1, and the Unit 1 and 2 Intakes during impingement surveys at TMINS in 1982.

	16A1	10A2	13A1	Unit 1	Unit 2	16A1 and 10A2	16A1, 10A2, and 13A1
NUMBERS							
16A1+	--						
10A2	0.56	--					
13A1	-0.11*	-0.24*	--				
Unit 1	0.04*	0.01*	-0.04*	--			
Unit 2	-0.04*	-0.02*	-0.07*	0.45	--		
16A1 and 10A2	0.76	0.75	-0.14*	0.05*	0.05*	--	
16A1, 10A2, and 13A1	0.68	0.57	0.14*	0.20*	0.15*	0.72	--
BIOMASS							
16A1	--						
10A2	0.28	--					
13A1	0.12*	0.00*	--				
Unit 1	0.16*	0.03*	-0.01*	--			
Unit 2	0.08*	0.12*	0.12*	0.42	--		
16A1 and 10A2	0.60	0.68	0.17*	0.13*	0.19*	--	
16A1, 10A2, and 13A1	0.38	0.32	0.67	0.27	0.28	0.90	--

+ Prefix TM-AQF- deleted from table.

* No correlation at $P < 0.05$.

Table 5.3-1

Number (n) and percent composition (%) of fish impinged annually at TBINS Unit 1, 1974 through 1982.

	1974		1975		1976		1977		1978		1979		1980		1981		1982		TOTAL					
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%				
Gizzard shad	2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	1	0.2	-	-	1	+				
Cyprinidae	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	+			
Common carp	-	-	6	1.3	-	-	23	0.7	-	-	-	-	-	-	-	-	-	-	1	0.3	30	0.4		
Golden shiner	3	0.2	2	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0.1	5	0.1		
Common shiner	7	0.6	16	3.4	4	0.6	-	-	1	0.5	-	-	1	0.4	-	-	-	-	29	0.4	29	0.4		
Common shiner	-	-	-	-	1	0.1	-	-	-	-	-	-	1	0.4	-	-	-	-	2	+	2	+		
Spottail shiner	98	8.0	45	9.5	69	10.1	183	5.4	25	13.0	28	9.8	7	2.6	61	15.1	12	6.2	528	7.3	528	7.3		
Swallowtail shiner	-	-	4	0.8	-	-	1	+	-	-	-	-	2	0.7	-	-	-	-	5	0.1	5	0.1		
Spotfin shiner	188	15.4	30	6.1	20	2.9	10	0.3	-	-	1	0.4	-	-	8	2.0	77	26.7	336	4.7	336	4.7		
Notropis spp.	64	5.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64	0.9	64	0.9		
Bluntnose minnow	2	0.2	-	-	4	0.6	-	-	-	-	-	-	-	-	-	-	-	-	10	0.1	10	0.1		
Fallfish	-	-	-	-	-	-	-	-	-	-	-	-	1	0.4	-	-	-	-	1	0.3	2	+		
Blacknose dace	-	-	1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	+	1	+	
Quillback	2	0.2	8	1.7	-	-	1	+	-	-	-	-	-	-	-	-	-	-	-	1	+	1	+	
White sucker	5	0.4	2	0.4	4	0.6	4	0.1	1	0.5	-	-	2	0.7	2	0.5	-	-	14	0.3	14	0.2		
Northern hog sucker	1	0.1	1	0.2	4	0.5	3	0.1	3	1.6	7	2.5	-	-	-	-	-	-	22	0.3	22	0.3		
Shorthead redhorse	-	-	2	0.4	-	-	7	0.2	4	2.1	2	0.7	-	-	1	0.2	-	-	19	0.3	19	0.3		
White catfish	5	0.4	3	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	0.2	17	0.2		
Yellow bullhead	45	3.7	5	1.1	9	1.3	4	0.1	6	3.1	-	-	3	1.1	2	0.5	-	-	8	0.1	8	0.1		
Brown bullhead	10	0.8	4	0.8	17	2.5	15	0.4	1	0.5	-	-	-	-	1	0.2	-	-	48	0.7	48	0.7		
Channel catfish	210	17.2	74	15.8	137	20.0	43	1.3	36	18.6	40	14.0	31	11.4	32	7.9	9	3.1	612	8.5	612	8.5		
Ictalurus spp.	10	0.8	-	-	-	-	-	-	-	-	-	-	2	0.7	-	-	-	-	12	0.2	12	0.2		
Margined madtom	17	1.4	14	2.9	45	6.6	31	0.9	13	6.7	29	10.2	11	4.1	10	2.5	-	-	170	2.4	170	2.4		
Centrarchidae	3	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	+	3	+	
Rock bass	3	0.2	3	0.6	2	0.3	43	1.3	14	7.3	11	3.9	3	1.1	8	2.0	15	5.2	102	1.4	102	1.4		
Redbreast sunfish	8	0.6	9	1.9	3	0.4	11	0.3	2	1.0	1	0.4	3	1.1	17	4.2	8	2.8	62	0.9	62	0.9		
Green sunfish	2	0.2	1	0.2	-	-	-	-	-	-	-	-	-	-	1	0.2	-	-	4	+	4	+		
Pumpkinseed	29	2.4	19	4.0	10	1.5	65	1.9	3	1.6	4	1.4	74	27.3	90	22.2	42	14.6	336	4.7	336	4.7		
Bluegill	17	1.4	18	3.8	7	1.0	57	1.7	4	2.1	1	0.4	20	7.4	26	6.4	32	11.1	182	2.5	182	2.5		
Lepomis spp.	12	1.0	20	4.2	-	-	-	-	4	2.1	7	2.5	25	9.2	2	0.5	41	14.2	111	1.5	111	1.5		
Smallmouth bass	10	0.8	10	2.1	2	0.3	19	0.6	22	11.4	10	3.5	2	0.7	7	1.7	1	0.3	83	1.2	83	1.2		
Largemouth bass	1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	+	1	+		
White crappie	5	0.4	-	-	2	0.3	6	0.2	1	0.5	-	-	-	-	4	1.0	-	-	18	0.2	18	0.2		
Black crappie	3	0.2	1	0.2	-	-	2	0.1	-	-	-	-	-	-	-	-	-	-	6	0.1	6	0.1		
Fomoxis spp.	2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	+	2	+	
Tessellated darter	447	36.6	172	36.1	317	46.3	2434	72.5	21	10.7	119	41.8	81	29.9	125	30.9	40	13.9	3796	52.3	3796	52.3		
Banded darter	3	0.2	2	0.4	25	3.6	350	10.4	27	14.0	12	4.2	1	0.4	3	0.7	-	-	423	5.9	423	5.9		
Etheostoma spp.	2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	+	2	+		
Shield darter	4	0.3	4	0.8	3	0.4	42	1.2	3	1.6	7	2.5	-	-	3	0.7	-	-	66	0.9	66	0.9		
Walleye	-	-	-	-	-	-	1	+	-	-	6	2.1	1	0.4	1	0.2	-	-	9	0.1	9	0.1		
Unidentified	2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	+	2	+		
Number of surveys	21		23		24		20		27		26		27		28		28		29		29		29	
Total number	1272		476		685		3359		193		285		271		405		288		7184		7184		7184	

+ Less than 0.05%.

Table 5.3-2

Number (n) and percent composition (%) of fish impinged annually at TMINS Unit 2, 1978 through 1982.

	1978		1979		1980		1981		1982		TOTAL	
	n	%	n	%	n	%	n	%	n	%	n	%
Common carp	1	0.2	-	-	-	-	-	-	3	1.4	4	0.2
Comely shiner	1	0.2	-	-	-	-	-	-	-	-	1	+
Common shiner	-	-	2	0.6	-	-	-	-	-	-	2	0.1
Spottail shiner	198	37.7	17	4.8	21	8.2	53	8.3	16	7.2	305	15.3
Rosyface shiner	1	0.2	-	-	-	-	-	-	-	-	1	+
Swallowtail shiner	-	-	3	0.9	-	-	-	-	-	-	3	0.2
Spotfin shiner	2	0.4	32	9.1	9	3.5	30	4.7	18	8.1	91	4.6
Mimic shiner	-	-	-	-	-	-	-	-	2	0.9	2	0.1
Bluntnose minnow	1	0.2	2	0.6	-	-	-	-	4	1.8	7	0.4
Fathead minnow	3	0.6	-	-	-	-	-	-	-	-	3	0.2
Catostomidae	1	0.2	-	-	-	-	-	-	-	-	1	+
Quillback	2	0.4	-	-	-	-	-	-	1	0.4	3	0.2
White sucker	3	0.6	8	2.3	-	-	3	0.5	2	0.9	16	0.8
Northern hog sucker	3	0.6	-	-	-	-	1	0.2	-	-	4	0.2
Shorthead redhorse	3	0.6	-	-	-	-	-	-	-	-	3	0.2
Yellow bullhead	2	0.4	1	0.3	5	2.0	3	0.5	4	1.8	15	0.8
Brown bullhead	5	0.9	-	-	-	-	3	0.5	-	-	8	0.4
Channel catfish	52	9.9	33	9.4	40	15.7	93	14.6	25	11.3	243	12.2
Ictalurus spp.	7	1.3	-	-	-	-	-	-	-	-	7	0.4
Margined madtom	30	5.7	15	4.3	14	5.5	22	3.4	12	5.4	93	4.7
Brook stickleback	-	-	-	-	-	-	1	0.2	-	-	1	+
Rock bass	15	2.8	17	4.8	4	1.6	17	2.7	19	8.6	72	3.6
Redbreast sunfish	2	0.4	-	-	2	0.8	29	4.5	22	10.0	55	2.8
Green sunfish	-	-	-	-	2	0.8	-	-	2	0.9	4	0.2
Pumpkinseed	4	0.8	10	2.8	52	20.4	34	5.3	21	9.5	121	6.1
Bluegill	8	1.5	8	2.3	19	7.4	8	1.2	6	2.7	49	2.5
Lepomis spp.	11	2.1	49	14.0	1	0.4	3	0.5	12	5.4	76	3.8
Smallmouth bass	77	14.7	5	1.4	3	1.2	5	0.8	2	0.9	92	4.6
Largemouth bass	3	0.6	-	-	-	-	-	-	-	-	3	0.2
White crappie	-	-	1	0.3	3	1.2	5	0.8	1	0.4	10	0.5
Black crappie	-	-	1	0.3	1	0.4	1	0.2	-	-	3	0.2
Pomoxis spp.	1	0.2	1	0.3	-	-	-	-	-	-	2	0.1
Tessellated darter	56	10.7	59	16.8	75	29.4	309	48.4	48	21.7	547	27.5
Banded darter	19	3.6	4	1.1	1	0.4	6	0.9	1	0.4	31	1.6
Yellow perch	5	0.9	-	-	1	0.4	-	-	-	-	6	0.3
Shield darter	-	-	-	-	1	0.4	12	1.9	-	-	13	0.6
Walleye	9	1.7	83	23.6	1	0.4	1	0.2	-	-	94	4.7
Number of surveys	23		20		27		28		29			
Total number	525		351		255		* 639		221		1991	

+ Less than 0.05%.

Table 5.3-3

Results of the two factor analysis of variance test for numbers of fish impinged during three sample periods (2000, 0400, and 1200 h) at TMINS Units 1 and 2, 1977 through 1982. Units 1 and 2, 1978 through 1982, are treated as separate years.

Source of Variation	df	SS	MS	F
Subgroups	32	327768.78	10242.77	1.58
Years	10	292787.48	29278.75	4.50*
Sample periods	2	4680.60	2340.30	0.36
Year-sample period Interaction	20	30300.70	1515.03	0.23
Error	339	2204693.47	6503.52	
Total	371	2532462.25		

* Significant at $P \leq 0.05$.

Table 5.3-4

Results of Duncan's new multiple range test for the effect of year on numbers of fish impinged at TMINS Units I and II, 1977 through 1982. Units I and II are treated as separate years, 1978 through 1982. Years are ranked from lowest to highest mean number.

Years:	1978 I	1982 II	1980 II	1980 I	1982 I	1979 I	1981 I	1979 II	1978 II	1981 II	1977 I

Table 5.3-5

Summary of Kendall's tau correlation coefficients for numbers and biomass of fish impinged at TMINS Units I and II positively correlated (*) with seine (Stations 16A1 and 10A2) and electrofishing (Zone 13A1) data, 1976 through 1982.

	1976 I	1977 I	1978 I	1978 II	1979 I	1980 I	1980 II	1981 I	1981 II	1982 I	1982 II
NUMBERS											
16A1+	*	*	*	*	--	--	--	--	--	--	--
10A2	--	--	--	--	--	--	--	--	--	--	--
13A1	--	*	*	*	*	--	--	--	--	--	--
Unit I	--	--	--	*	--	--	*	--	*	--	*
Unit II	--	--	*	--	--	*	--	*	--	*	--
16A1 and 10A2	--	--	--	--	--	--	--	--	--	--	--
16A1, 10A2, and 13A1	*	--	--	--	--	--	--	--	--	--	--
BIOMASS											
16A1	*	*	*	*	--	--	--	--	--	--	--
10A2	--	--	*	--	--	--	--	--	--	--	--
13A1	*	*	*	*	*	--	--	--	--	--	--
Unit I	--	--	--	*	--	--	*	--	*	--	*
Unit II	--	--	*	--	--	*	--	*	--	*	--
16A1 and 10A2	--	--	*	--	--	--	--	--	--	--	--
16A1, 10A2, and 13A1	*	*	*	*	*	--	--	*	--	*	*

+ Prefix TM-AFQ- deleted from table.

* $P < 0.05$.

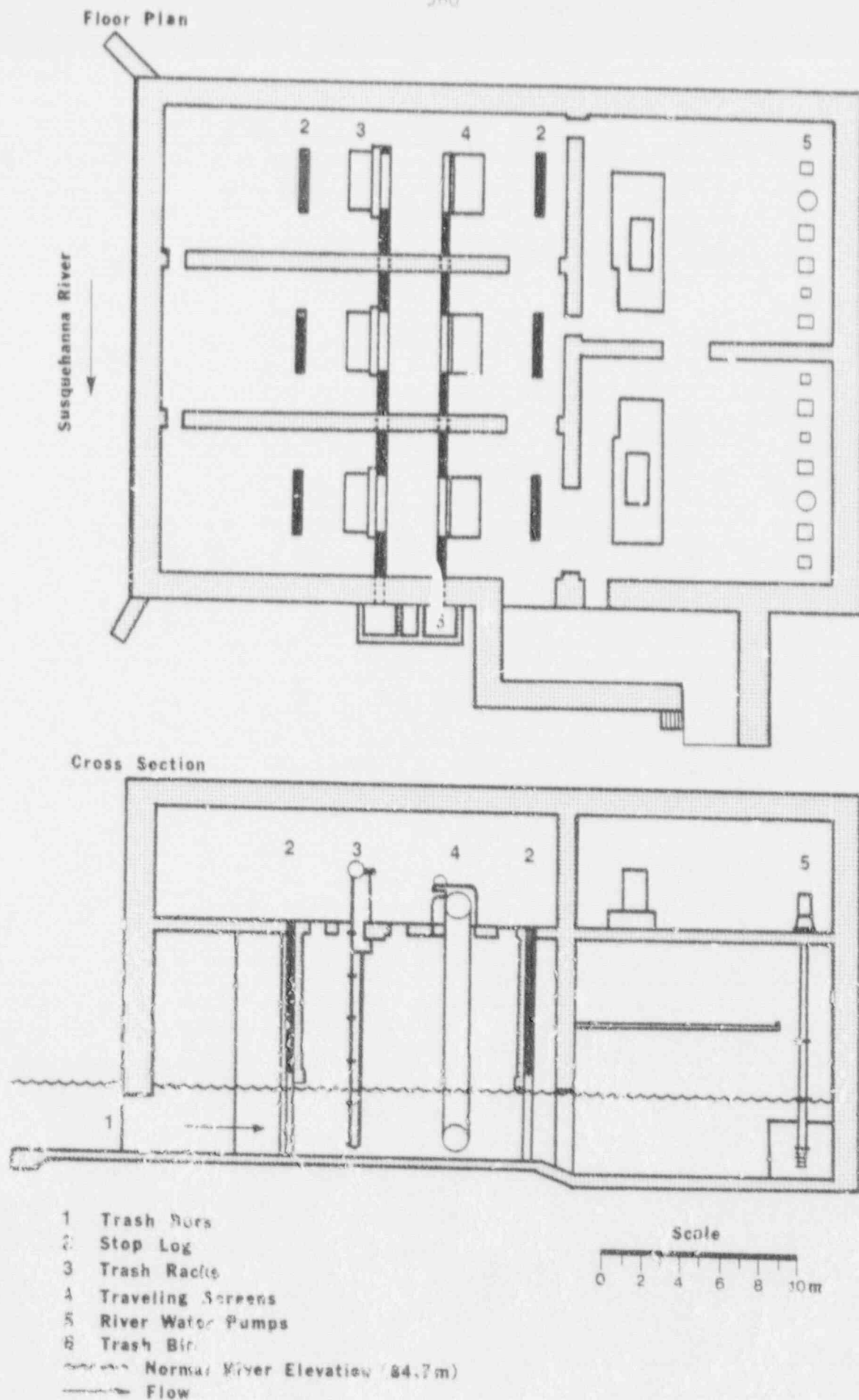


Figure 5.0-1. Three Mile Island Nuclear Station Unit 1 Intake, general floor plan and cross section diagrams.

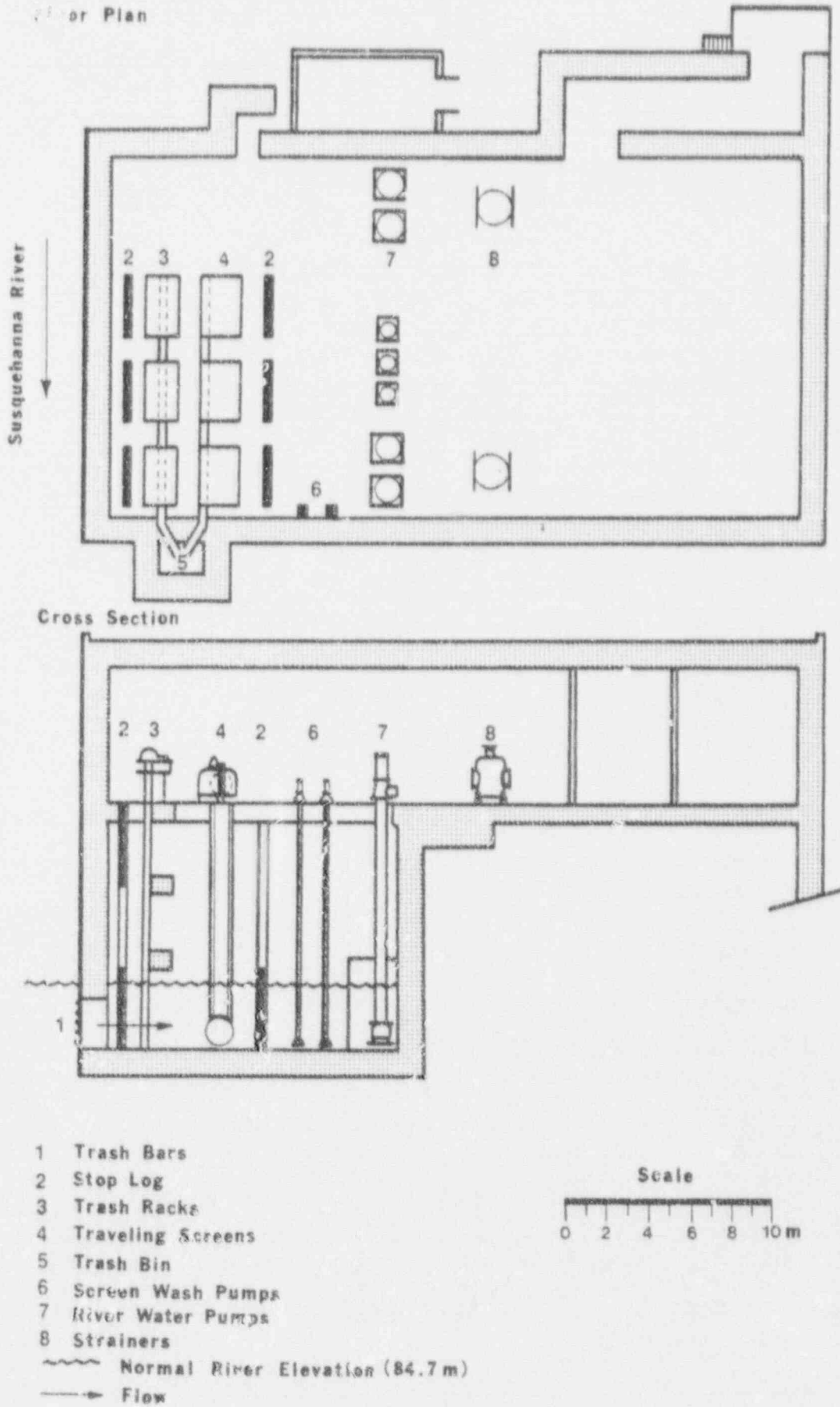


Figure 5.0-2. Three Mile Island Nuclear Station Unit 2 Intake, general floor plan and cross section diagrams.

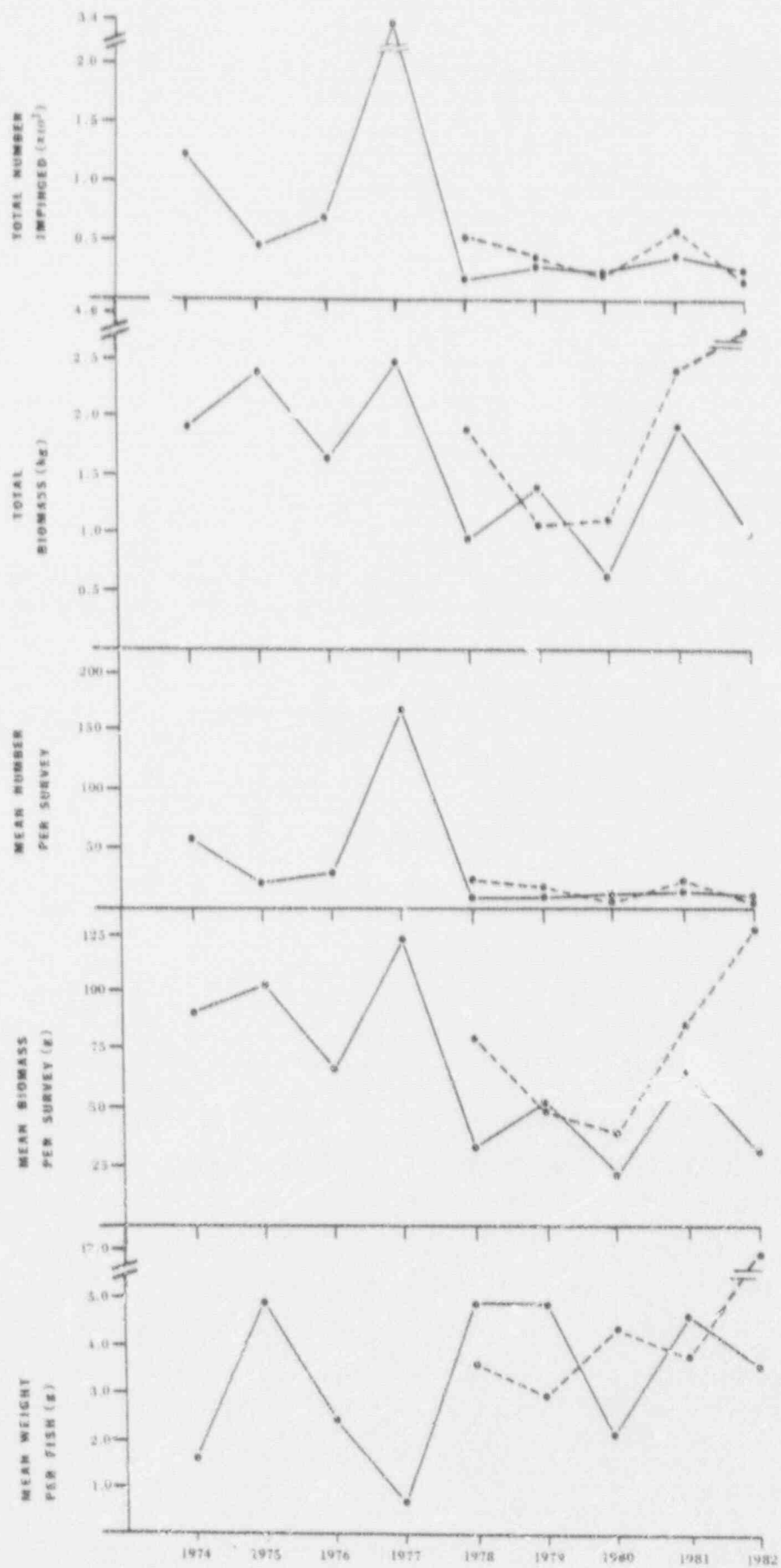


Figure 5.3-1. Total and mean numbers and biomass, and mean weight per fish impinged at TWDS Unit 1 (solid line) 1974 through 1982, and Unit 2 (dashed line) 1978 through 1982.

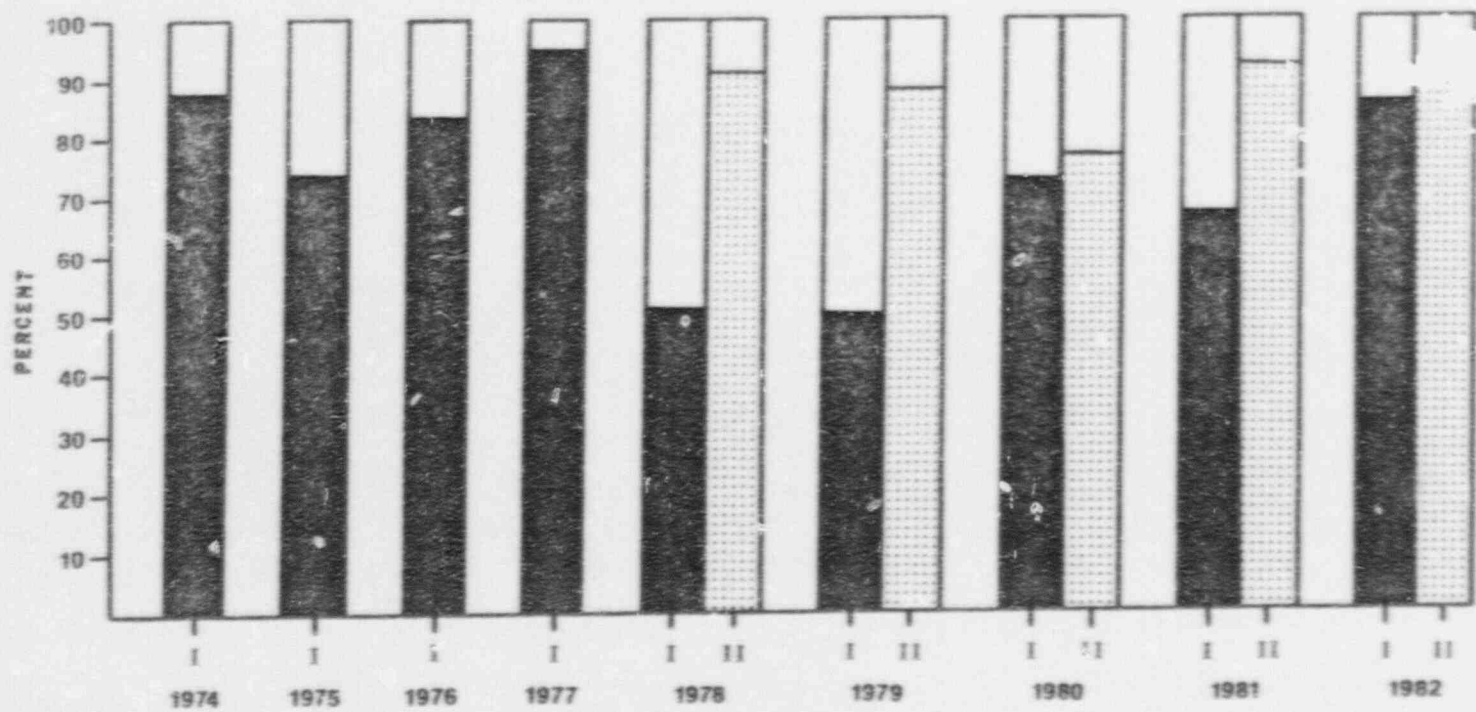


Figure 5.3-2. Percent of dead (shaded) and alive (white) fish impinged at THINS Unit I (1974 through 1982) and Unit II (1978 through 1982).

6.0 FISH

The ichthyofauna near TMINS was sampled to (1) detect and assess changes in species composition, relative abundance, seasonal and spatial distribution, diversity, condition factor, and reproductive status; (2) monitor occurrence of dead, deformed, and parasitized fish; and (3) provide fish for radiation analysis and movements studies.

6.1 TRAPNET

6.1.1 METHODS

Fish were sampled at four stations once in March and semimonthly April through December 1982 (Table 6.1-1 and Figure 6.1-1). Ice cover and/or high river flow prevented all sampling in January and February and a second March collection.

Data recorded for all collections were weather, time, air and surface water temperatures, surface dissolved oxygen concentration and pH, and secchi disc. River stage was obtained from the River Forecast Center in Harrisburg, Pennsylvania for 0700 hour.

Each trapnet consisted of a 0.91 m by 15.24 m lead net and a 0.91 m by 1.83 m metal frame connected to two traps (4, 0.76 m diameter hoops). The lead and trapnet were of 1.27 cm mesh. Nets were set for about a 24-hour period, pulled and the captured fish removed, and reset for a second 24-hour period. Effort was made to set trapnets perpendicular to shore; however, high river flow sometimes resulted in nets being set at angles of 45 degrees or less to shore to prevent rolling. Fish were identified, measured (to the nearest mm fork length, FL), weighed (to the nearest 1.0 g), and released near the site of capture. For

collections that contained more than 50 fish of one species a subsample of 50 fish of that species was removed for length and weight analysis; all other specimens of that species were counted and released.

Scientific and common names of fishes and taxonomic order of presentation (Table 6.1-2) followed Robins et al. (1980).

Family composition at individual stations were computed by summing the percentages contributed by fishes within each family.

Species diversity (described in Section 2.0) was calculated for each trapnet station to analyze community structure.

Percent similarity indices (described in Section 2.0) between trapnet stations were computed to determine the similarity of species composition.

Condition factor (K) for fishes that comprised more than 10% of the 1982 catch was calculated from the formula (Weatherley 1972):

$$K = 100 W/L^3$$

where W = the mean weight (g) per 5 mm FL interval and L = the upper limit of each 5 mm FL interval expressed in cm. Dead fish were not weighed and were omitted from computations as decomposition would bias weights.

Reproductive status for fishes that comprised more than 10% of the 1982 catch was determined as follows: young were spawned during the current calendar year, juveniles were incapable of reproduction or minnows and darters less than 26 mm FL collected prior to the current spawning season, and adults were capable of reproduction. Classifications

were based on field observations and information in the literature (Carlander 1953, 1969, 1977; Miller and Buss 1963; Scott and Crossman 1973; Trautman 1981).

Fish were examined for ectoparasites. Also, dead fish observed in York Haven Pond were noted.

Kendall's coefficient of rank correlation (Dixon 1975) was applied to the catch data to analyze the variation among stations.

6.1.2 RESULTS

Results from March through December are reported in Tables 6.1-3 through 6.1-21 and summarized in Tables 6.1-22 through 6.1-30. A total of 152 trapnet collections (38 collections at each station) yielded 2,531 fish of 27 species and one hybrid (Table 6.1-27). Most fish (1,032) and most species (22) were taken at Station 9B2. The mean number of specimens per collection ranged from 11.84 at Station 11A3 to 27.16 at Station 9B2.

The spottail shiner (20 specimens) dominated the March collection of 62 fish (Table 6.1-26). Channel catfish (36), rock bass (24), and black crappie (16) abundances greatly increased over the March catch and comprised over 61% of the April catch. The largest monthly catch (504) occurred in May and coincided with the peak pumpkinseed catch (330), over 85% of which was taken on 17-19 May (Table 6.1-7). In June, the catch dropped to 338 fish as the pumpkinseed catch (118) declined to less than half the May total. Peak catches of white crappie (87) and black crappie (89) inflated the July catch to 374 fish.

Although the quillback catch peaked in August (30 fish), the month's total catch dropped to 230 fish due to declines in abundances of pumpkinseed (61), white crappie (48), and black crappie (38). Increases in catches in September (338) and October (352) corresponded to increases in pumpkinseed catches (139 and 201, respectively). Most common species declined in abundance in November; 175 fish were taken. Only 34 fish were collected in December.

The pumpkinseed ranked first in overall abundance (41.2% of the total catch) and was the most numerous species at all stations (Table 6.1-27). It also was the most abundant species by month May through November (Table 6.1-26). The black crappie ranked second in abundance (14.8%); over 44% were taken at Station 9B2. The white crappie was third most abundant (14.0%); over 61% were taken at Station 9B2. The rock bass (7.6%) and bluegill (6.7%) ranked fourth and fifth in abundance, respectively. Sunfishes and catfishes ranked first and second, respectively, in family composition at all stations (Table 6.1-31).

Diversity indices calculated from summary data for each station ranged from 2.57 at Station 9B2 to 3.04 at Station 11A3 (Table 6.1-27). The highest monthly diversity for combined stations (3.17) occurred in April (Table 6.1-26). Monthly indices at individual stations ranged from 0.94 at 1A3 in December to 2.82 at 11A2 in June (Tables 6.1-22 through 6.1-25).

Percent similarity indices ranged from 70.0 between Stations 11A3 and 9B2 to 87.9 between 1A3 and 11A2 (Table 6.1-32). Values were in the intermediate to high affinity range (>50.0) due to the relatively equal compositions of pumpkinseed, black crappie, white crappie, rock bass, and bluegill at all stations.

Total biomass for 1982 was 371.70 kg (Table 6.1-28). Biomass was relatively equal at Stations 1A3 (97.93 kg), 11A3 (108.25 kg), and 9B2 (101.26 kg). The largest monthly biomass for combined stations (82.87 kg) occurred in June when Station 1A3 contributed 40.38 kg, the largest monthly biomass at an individual station. The common carp accounted for the greatest biomass for a single species (73.08 kg); over 60% was recorded in June (Table 6.1-29). Over 55% of the common carp biomass occurred at Station 1A3 (Table 6.1-30). Other fishes with high biomasses were the channel catfish (66.41 kg, over 51% at 11A3), pumpkinseed (60.64 kg), black crappie (42.43 kg), quillback (38.30 kg, approximately 70% both in August and at 11A3), white crappie (22.64 kg, over 58% at 9B2), rock bass (20.44 kg), and bluegill (13.39 kg, over 53% at 9B2).

6.1.2.1 MEAN WEIGHT, CONDITION FACTOR (K), AND REPRODUCTIVE STATUS

Mean weights, condition factors, and reproductive status per 5 mm FL interval for pumpkinseed, white crappie, and black crappie taken by trapnet are presented in Tables 6.1-33 through 6.1-35. All other fishes comprised less than 10% of the total catch and were excluded from these analyses. Most pumpkinseed mean weights and K factors were similar among

tations in FL intervals that contained more than 10 specimens. Many white crappie and black crappie mean weights and K factors were also similar although comparisons among Stations 1A3, 11A2, and 11A3 were based on fewer than 10 specimens in all but two FL intervals.

Mean K factors for young, juvenile, and adult pumpkinseed, white crappie, and black crappie were computed from combined totals at all stations, and compared to values from the last year in which K factors were calculated for that species, 1981 for pumpkinseed and white crappie and 1980 for black crappie.

Juvenile and adult pumpkinseed K factors in 1982 were higher than their corresponding 1981 values; no young pumpkinseed were collected in 1982. Juvenile K's were 2.11 in 1981 (n = 90) and 2.31 in 1982 (n = 8). Adult values derived from over 900 specimens in both years were higher in 1982 (2.51 in 1982 vs. 2.35 in 1981), and approximated the highest K (2.58) reported in 1980 (Nardacci and Associates 1982).

White crappie K factors in 1982 were similar to their 1981 counterparts in all reproductive categories. Values for young were 1.27 in 1981 (n = 23) and 1.34 in 1982 (n = 10). Juvenile K's were 1.25 (n = 90) in 1981 and 1.27 (n = 35) in 1982. Adult values derived from over 300 specimens in both years were 1.33 in '81 and 1.34 in 1982. Corresponding white crappie K's were higher in 1978 (Nardacci and Associates 1982) when fewer specimens were collected than in 1981 and 1982.

Black crappie K factors for young were 1.61 (n = 79) in 1980 and 1.54 (n = 2) in 1982. Juvenile K's were 1.51 (n = 17) in 1980 and

1.54 (n = 14) in 1982. Adult black crappie K factors derived from over 300 fish in each year were 1.75 in 1980 and 1.78 in 1982.

Adults were the most prevalent reproductive group of pumpkinseed at all stations and comprised more than 99% of all pumpkinseed measured (Table 6.1-33). No young pumpkinseed were collected and juveniles were uncommon. The majority of specimens was concentrated in FL intervals of 1.0-150 mm at all stations.

Adults were also the most abundant reproductive group for white crappie and black crappie at all stations and comprised over 97% and 95%, respectively, of their species totals (Tables 6.1-34 and 6.1-35). Young and juveniles of both species were uncommon.

Pumpkinseed spawning appeared to be influenced by water temperature. Ripe males and females were first captured and were most abundant (2.1♂:1♀) on 17-19 May when water temperature averaged 22.5 C. Water temperature dropped to about 16 C in late May, rose to about 21 C in early June, dropped to about 16 C again in mid-June, and did not rise above 22 C until late June (see Figure 3.2-1, Section 3.0). As a result of fluctuating water temperature, pumpkinseed spawning was sporadic during June and July when it is usually most concentrated. Ripe males and females were collected through 19 August, but were never as abundant as on 17-19 May. Burns (1976) cited water temperature as the environmental factor that triggered initiation of gonadal recrudescence in pumpkinseed.

One ripe male white crappie and two ripe male black crappie all taken on 19 May were the only ripe specimens of either species collected.

6.1.2.2 PARASITES

Parasite occurrence was minimal throughout the year and exceeded 10 occurrences per month only in May and November. Most infections involved leeches (probably Myzobdella lugubris), anchor worms (Lernaea), or exophthalmos. Parasites were encountered in every month sampled.

Most leech infestations occurred on channel catfish although white catfish, rock bass, redbreast sunfish, pumpkinseed, bluegill, largemouth bass, and walleye were also parasitized. Anchor worms were most common on pumpkinseed but were also found on white sucker, redbreast sunfish, bluegill, and white crappie. Exophthalmos (abnormal protrusion of the eyeballs), a condition possibly caused by larval trematodes of the genus Diplostomulum (Hoffman 1970), was observed on 14 pumpkinseed (12 in May and 2 in June). Fin necrosis was found on channel catfish, pumpkinseed, and black crappie.

Anomalies observed were few and included mouth deformities on common carp, brown bullhead, and redbreast sunfish; spinal deformities on pumpkinseed; and eye anomalies of channel catfish, pumpkinseed, and white crappie.

Fishes found dead in trapnets included 9 white crappie, 7 pumpkinseed, 2 rock bass, 2 black crappie, 1 river chub, 1 spottail shiner, and 1 redbreast sunfish. All specimens were small and were probably killed in the nets by large channel catfish.

A total of 61 dead fish of at least 12 species was observed throughout York Haven Pond. The number of observations per species

was as follows: common carp (6), quillback (2), white sucker (1), northern hog sucker (1), shorthead redhorse (6), unidentifiable sucker (2), unidentifiable bullhead (1), channel catfish (1/), rock bass (1), redbreast sunfish (1), smallmouth bass (25), and walleye (1). Dead fish were most numerous in May (20 specimens), June (11), and July (18) and may have originated upstream outside the study area. The 1982 dead fish total (61) was similar to that reported in 1981 (64) and much less than 1980 (136) or 1979 (107) (Nardacci and Associates 1982).

No pattern of parasite infection, anomalies, or fishkills was observed with respect to the location of TMINS.

6.1.3 DISCUSSION

The 1982 trapnet catch (2,531 fish) represented a decrease of over 1,000 fish from the peak catch (3,580) established in 1981. Other 1982 totals of number of specimens per collection (16.65) and biomass (371.70 kg) also represented decreases from their 1981 counterparts (23.55 and 402.55 kg, respectively). However, the 1982 diversity index (2.83) was similar to the 1981 value (2.85).

Annual catches of channel catfish, rock bass, pumpkinseed, white crappie, and black crappie are illustrated in Figure 6.1-2. The channel catfish catch was less than half the 1981 value and represented the second lowest annual catch. Except for 1974 and 1975 channel catfish catches which were dominated by juveniles, most specimens captured have been adults. The rock bass catch declined from the

annual peak (335) established in 1981 but remained above catches taken during 1975 through 1979. Pumpkinseed numbers continued to drop from the 1980 peak (1,593) but remained more than double the previous high set in 1974. The white crappie catch was the second largest to date but still represented a decrease from the 1981 peak. The black crappie was the only major species that exhibited an increase over 1981; the 1982 catch (375) was slightly less than the peak catch set in 1980 (427).

The 1982 catches at all stations were less than the 1981 levels, but remained well within the ranges established in previous years (Figure 6.1-3).

Results of Kendall's coefficient of rank correlation tests showed positive correlations ($P \leq 0.05$) of species ranks within individual stations through time (1974 through 1982). This indicated that although the total station catches per year were variable, the species composition and distribution within stations were similar.

As in 1980 and 1981, seasonal abundance of trapnet catches was greatest in summer and fall. However, the peak catch occurred earlier than usual in May and was probably attributable to above normal water temperature (>22.0 C) on 17-19 May which brought about earlier inshore spawning aggregations of pumpkinseed. Water temperature of 20.0 C is required for pumpkinseed spawning (NAS/NAE 1973). Above normal river flow in June and early July reduced trapnet efficiency. No strong sunfish year classes, as indicated by large catches of young and juveniles, have occurred since 1980; adults continued to dominate peak summer and fall catches.

To summarize, although most 1982 totals were lower than 1981 values, they were well within the ranges established in previous years. Catch reductions were likely caused by natural fluctuations in water temperature, river flow, and fish populations and were not related to TMINS operation.

6.2 SEINE

6.2.1 METHODS

Collections were taken at 10 stations once in January and semimonthly March through December 1982 (Table 6.2-1 and Figure 6.2-1). Ice cover and/or high river flow prevented all sampling in February and a second collection in January. The second sampling in December was hampered by ice cover and had to be completed over two dates.

Data recorded for each collection were weather, time, duration of sample, air and surface water temperatures, surface dissolved oxygen concentration and pH, secchi disc, estimated water depth, substrate type, and number of hauls. River stage was obtained from the River Forecast Center in Harrisburg, Pennsylvania for 0700 hour.

A 3.05 m by 1.22 m seine with 0.32 cm mesh was used. Since size and habitat of seine stations varied (Table 6.2-1), effort was made to collect a representative qualitative sample (Hocutt 1981) based on complete coverage of all available habitats rather than a specified number of hauls at each station.

All specimens collected at a station were fixed in 10% formalin except for large fish (>150 mm fork length, FL) which were identified.

measured, and released near the site of capture. After one week the fish were removed from the formalin and placed in water. After 24 hours the water was replaced with fresh water for a second 24-hour period. The purpose of the two water rinses was to remove formalin residues and to facilitate handling. Following 48 hours in water the fish were preserved in 40% isopropanol for processing and storage (Fink et al. 1979).

Specimens in each collection were identified and measured to within a 5 mm FL interval. Specimens within these length intervals were weighed together to the nearest 0.1 g. For collections that contained more than 125 fish of one species a subsample of 125 fish of that species was removed for length and weight analysis; all specimens were counted.

References used for identification were Trautman (1981) and those mentioned in Section 6.2 of Nardacci and Associates (1981). Scientific and common names of fishes and taxonomic order of presentation (Table 6.1-2) followed Robins et al. (1980).

Family composition at individual stations was computed by summing the percentage contributed by fishes within each family.

Species diversity (described in Section 2.0) was calculated for each seine station from the machine formula of the Shannon-Weaver information theory.

Percent similarity indices (described in Section 2.0) between seine stations were computed.

Condition factor (described in Section 6.1) for fishes that comprised more than 10% of the 1982 catch was calculated.

Reproductive status for fishes comprising more than 10% of the 1982 catch was determined as follows: young were spawned during the current calendar year, juveniles were incapable of reproduction or minnows and darters less than 26 mm FL collected prior to the current spawning season, and adults were capable of reproduction. Classifications were based on information in the literature (Carlander 1953, 1969, 1977; Miller and Buss 1963; Scott and Crossman 1973; Trautman 1981) and were confirmed in the field when possible.

Preserved specimens were examined for ectoparasites. When a subsample of a species was removed for length and weight analysis only the specimens within the subsample were examined for ectoparasites.

Kendall's coefficient of rank correlation (Dixon 1975) was applied to the catch data to analyze the yearly variation in rankings of species at stations. Station totals of specimens reported as white sucker and white sucker/shorthead redhorse in Nardacci and Associates (1977) and Nardacci et al. (1977) were combined as white sucker to facilitate Kendall's coefficient analysis.

Also, Cochran's Q-statistic and the M-statistic (Hendrickson 1978) were applied to 1982 station totals. The Q-statistic compared the numbers of species per station, while the M-statistic tested for differences in species composition based on the number of species in common at each station. Results were compared at the 5% probability level to values in the chi-square distribution.

6.2.2 RESULTS

Results of 1982 seine collections are presented in Tables 6.2-2 through 6.2-22 and summarized in Tables 6.2-23 through 6.2-37. A total of 871 hauls yielded 102,892 fish of 40 species (Table 6.2-34). Most fish (33,130) were taken at Station 13B5 and most species (28) at Stations 10B5 and 1A2. The mean number of specimens per haul at individual stations ranged from 22.60 at Station 9A1 to 552.17 at Station 13B5.

The spotfin shiner comprised 80.8% of the total catch and was the most abundant species throughout 1982 (Table 6.2-33). The mimic shiner ranked second in overall abundance (5.0%) and the spottail shiner third (3.8%, over 64% taken in June). Other common fishes were the pumpkinseed/bluegill (1.9%), pumpkinseed (1.6%), bluegill (1.3%), bluntnose minnow (1.2%), white sucker (1.1%), and tessellated darter (1.0%). The comely shiner, spottail shiner, swallowtail shiner, spotfin shiner, mimic shiner, pumpkinseed, and tessellated darter occurred at all stations (Table 6.2-34) and in all months sampled.

Minnows ranked first in family composition at all stations (Table 6.2-38). Spotfin shiner overabundance created new maxima for minnow composition at Stations 16A5 (97.8%), 10A2 (98.0%), 9B6 (97.6%), and 12.5%). New maximum values for sunfish composition at Stations 16A1 (25.8%) and 9B3 (11.5%) were more than double previous highs.

Fluctuations in monthly catches were most influenced by spotfin shiner abundance (Table 6.2-33). January (102.76 fish/haul), March

(83.57), April (72.86), and May (124.84) catches were variable although the spotfin shiner comprised at least 82% of the catch in each of these months. In June (108.99/haul), the spotfin shiner composition declined to 41% but was compensated for by peak catches of spottail shiner (2,523 specimens), white sucker (1,019), and tessellated darter (592). The July catch (32.96/haul) was the year's lowest as spotfin shiner composition dropped to its yearly low and spottail shiner, white sucker, and tessellated darter numbers declined from their June totals. In August (162.46/haul), spotfin shiner composition rose to over 67% as young dominated (Figure 6.2-2) and the peak mimic shiner catch (1,750) was recorded. Catches reached their maxima in September (236.79/haul) as spotfin shiner abundance peaked (17,075 specimens). Catches declined in October (169.93/haul), November (137.87/haul), and December (55.75/haul) although spotfin shiner composition was over 89% throughout the period.

Biomass totaled 23,220.1 g for the year (Tables 6.2-35 through 6.2-37). Almost identical monthly highs for the year were recorded in June (3,659.1 g) and September (3,659.0 g). Station 13B5 had the greatest biomass for a single station (5,820.2 g). The spotfin shiner total biomass (14,698.2 g) was over 63% of the annual total.

Most overall station diversity indices were low due to spotfin shiner dominance and ranged from 0.54 at Station 9B6 to 2.52 at Station 9B3 (Table 6.2-34). Combined monthly indices for all stations were also low and ranged from 0.31 in December when the spotfin shiner accounted for over 96% of the total catch to 2.40 in June when the

spotfin shiner contributed only 41% and most species for one month (32) were taken (Table 6.2-33). Monthly indices at individual stations ranged from no diversity at 10B5 in January and at 16A5 in March to 2.85 at 10A2 in June (Tables 6.2-23 through 6.2-32). Low diversities that result from the collection of vast numbers of gregarious young fishes are natural phenomena and may not be indicative of a stressed environment (Focutt 1981).

Percent similarity indices were very high when spotfin shiner composition was similar between stations (Table 6.2-39). The greatest similarity (96.0%) occurred between Stations 10A2 and 9B6 where spotfin shiner comprised 91.0% and 93.5% of the total catch, respectively (Tables 6.2-28 and 6.2-29). Low similarities with Station 9B3 resulted from its low percentage of spotfin shiner (41.2%) and high percentages of spottail shiner (20.2%), pumpkinseed/bluegill and tessellated darter (10.8% each), brown bullhead (7.0%), and white sucker (5.7%) (Table 6.2-31).

Common fishes that exhibited peak abundances in June just after their spawns were the spottail shiner, white sucker, and tessellated darter (Table 6.2-33). Post-spawn peak abundance was exhibited by the mimic shiner and pumpkinseed/bluegill in August.

The golden shiner demonstrated spawning habitat preference over 78% of all specimens were young taken at Station 10B5 where water willow and wildcelery were most common and provided the essential vegetation for their adhesive eggs (Table 6.2-24). Two hundred sixty-two young (11-31 mm FL) brown bullhead from an apparent brood were collected in one haul at Station 9B3 on 19 July (Table 6.2-12). Parent brown bullhead

protect their school of young for several weeks until the school disperses (Harlan and Speaker 1956). Uneven distribution of young Lepomis may have been caused by the affinity of these fishes for protected areas with slow-moving water and/or aquatic vegetation. Pumpkinseed were most abundant at Stations 13B5 (39.6%) and 1A2 (36.0%), bluegill at 13B5 (44.2%) and 4A2 (35.5%), and pumpkinseed/bluegill at 16A1 (43.5%). Disproportionately high percentages of some common species occurred at stations for unknown reasons: spottail shiner (31.8% at 10B5), spotfin shiner (33.2% at 13B5), mimic shiner (53.5% at 13B5), and tessellated darter (37.8% at 9B3).

6.2.2.1 MEAN WEIGHT, CONDITION FACTOR (K), AND REPRODUCTIVE STATUS

Mean weights, condition factors, and reproductive status per 5 mm FL interval for spotfin shiner, the only species that comprised more than 10% of the 1982 catch, are presented in Table 6.2-40. Young spotfin shiner were abundant at all stations, juveniles were common, and adults were uncommon. Many mean weights for respective FL intervals were identical among a number of stations; most differences were negligible among stations with large (>25 specimens) comparable catches. Many K factors were also identical; however, as the result of multiplication in the formula, minute mean weight differences increased some K factor discrepancies. Most spotfin shiner entered the 1981-1982 winter at lengths of 16-30 mm FL (Nardacci and Associates 1982); growth of the 1981 year class did not appear to resume until June 1982 (Figure 6.2-2). Larger fish (>61 mm FL) first observed in April were probably pre-

spawning adults. Spawning began in mid-July as evidenced by catches of both young and adults and appeared to extend through August. Growth of the 1982 year class was minimal; most specimens entered the 1982-1983 winter at lengths of 16-30 mm FL.

Some less abundant fishes were observed in breeding condition. One adult male rosyface shiner was in breeding coloration with brick red breast and snout. Gravid female tessellated darter were collected from 21 April through 17 May. Tuberculate male bluntnose minnow were taken from 17 May through 1 July. Gravid female pumpkinseed were collected throughout June. Gravid female swallowtail shiner and bluegill were taken on 14 June.

6.2.2.2 PARASITES AND ANOMALIES

Parasite occurrence was moderate to heavy throughout the year and appeared influenced by fish size and water temperature. The relationships of water temperature and mean fork length to frequencies of glochidia and slight black spot infestations on spotfin shiner, the most frequently infected species in terms of percent specimens parasitized, are illustrated in Figure 6.2-3. Although slight black spot infestations were common on spotfin shiners all year, no specimens appeared detrimentally affected. Black spot frequency of occurrence remained fairly stable through June while mean fork length increased due to growth of the 1981 year class and the appearance of pre-spawning adults beginning in April (Figure 6.2-2). The decline in mean fork length to less than 25 mm FL on 2 August resulted from

recruitment of young from the 1982 spawn, and coincided with a sharp drop in slight black spot occurrence to its lowest point of the year. This phenomenon was also observed in 1981 (Nardacci and Associates 1982) and was likely attributable to both the small size of young (<21 mm FL) and the 22 day period from cercaria penetration until the development of noticeable black spot (Berra and Au 1978). During August through December growth was minimal and the frequency of black spot occurrence remained stable although exposure time to parasitism increased. The frequency of black spot occurrence increased with exposure time during August through December 1981 (Nardacci and Associates 1982) although growth was again minimal. Water temperature fluctuations in August through December 1982 may have interrupted the parasites digenetic life cycle and prevented an increase in frequency of occurrence. The gregarious nature of young spotfin shiners, particularly in slow-moving waters, allowed close proximity of parasite to host and may explain the high incidences of black spot parasitism. Most other common fishes exhibited slight black spot infestations, but at less severe frequencies.

Glochidia infestation (number of infected fish) was heaviest on spotfin shiner; percent frequency of glochidia occurrence peaked in March and December (Figure 6.2-3). No spotfin shiners were observed parasitized by glochidia from 17 May through October; the length of the parasitic phase is directly proportional to water temperatures and therefore shorter during warmer months (Meyer 1962). The high frequency of

occurrence observed on 20 December was unprecedented. Most other common fishes (particularly minnows) were also parasitized. Although many affected fish supported more than one encysted glochidium, no incidences of poor fish condition were attributed to glochidia infection.

Anchor worm (Lernaea) infection was most prevalent on minnows and sunfishes and occurred during May through November with a peak in September. The lack of 23 to 30 C water temperatures needed to complete the L. cyprinacea life cycle (Meyer 1968) may explain the absence of anchor worms during colder months.

The myxosporidian protozoan Thelohanellus exhibited host specificity; subdermal cysts were observed only on a few comely shiner and bluntnose minnow. Occurrences were most numerous in May and September.

The leech, Myzobdella lugubris, was recorded from five fishes. Most infestations were on channel catfish, smallmouth bass, and tessellated darter.

Thirty-six fish exhibited abnormalities. Pugheadedness (abnormal formation of the skull) was the most frequent deformity and was observed on five spotfin shiner and 15 mimic shiner. Scoliosis (lateral spinal curvature) was seen on eight spotfin shiner and one pumpkinseed. Kyphosis (abnormal backward spinal curvature) was observed on two spotfin shiner. Five spotfin shiner exhibited mandibular deformities. Causes of fish abnormalities include natural fluctuations in temperature and dissolved oxygen concentration. Abnormalities appear during early development of affected individuals

(Hickey 1973). The survival rate of abnormal fish to reproductive age was not determined; all affected specimens were young or juvenile.

Patterns of parasite infection and abnormalities were similar to those reported in previous years (Nardacci and Associates 1980, 1981, 1982) and seemed most affected by natural trends in parasite life cycles, water temperature, and fish size rather than by TMINS operation.

6.2.3 DISCUSSION

The 1982 seine catch of 102,892 fish represented a minor increase over the 1981 catch (98,564), the previous high. However, since 78 additional hauls were taken in 1982, the catch in terms of fish per haul was slightly lower (118.13/haul in 1982 vs. 124.29/haul in 1981). Stations 10B5 and 10A2 established new record catches (Figure 6.2-4). Catches at all other stations were within ranges established in previous years. Catches at 4A2 and 1A2 approached the upper limits of their ranges while those at 9A1 and 9B3 approached their lower limits.

Annual catches of the spottail shiner, spotfin shiner, and white sucker are illustrated in Figure 6.2-5. Spottail shiner and white sucker both approximated their lowest catches to date recorded in 1975. The spotfin shiner catch dropped from the 1981 peak but was the second highest yearly catch.

Some less common species have also shown yearly differences in abundance. The mimic shiner catch (5,171) continued its increase after an unexpected decline in 1980. Another strong year class was indicated as most mimic shiner collected were young. Substantial

increases were also noted for the golden shiner (94 in 1981, 210 in 1982), swallowtail shiner (182 in 1981, 650 in 1982), and brown bullhead (0 in 1981, 266 in 1982). The increase in 1982 pumpkinseed/bluegill catches (1,926) over 1981 catches (449) may be misleading due to the difficulty in separating the two species; overall the catches of pumpkinseed (1,690 in 1982; 1,313 in 1981) and bluegill (1,314 in 1982; 1,337 in 1981) were similar. Substantial decreases were observed for the bluntnose minnow (2,131 in 1981; 1,216 in 1982), quillback (174 in 1981; 10 in 1982), and tessellated darter (1,546 in 1981; 1,068 in 1982).

Results of Kendall's coefficient of rank correlation tests showed positive correlations ($P \leq 0.05$) of species ranks within all individual stations over time. The results indicated that although large differences have occurred, the magnitudes of changes and species rankings at stations have remained similar. Cochran's Q-statistic was not significant ($Q = 14.507$, $DF = 9$) and indicated homogeneity in the total number of fishes per station. However, the M-statistic showed a significant difference ($M = 54.780$, $DF = 36$) in the number of species common to stations. The occurrence of a significant M-statistic with a Q-statistic that is not significantly large is not uncommon (Hendrickson 1978) and was partially caused by the unequal distribution of rare species, which increased the range of positive species matches among stations.

Seasonal Susquehanna River flow patterns, normally characterized by high spring flows and lower flows in summer and fall, favor the intermittent spawning of spotfin shiner (Gale and Gale 1976) throughout July and August. Intermittent spawning prolongs the spawning season

and protects the species against the destruction of entire year classes (Nikolsky 1963). July and August river flows are normally low and stable, as occurred in 1982, and afford optimal spotfin shiner spawning conditions. Spotfin shiner young were often very abundant (>1,000/haul) at Station 13B5 during August through December; yearly comparisons should be based on relative abundance. Spottail shiner and white sucker spawn in May and June, therefore their reproductive success is subject to high and/or rapidly fluctuating river flow. Heavy rains in May and June 1982 greatly increased river flow in June (Figure 3.2-1, Section 3.0) and may explain the downward trend in spottail shiner and white sucker numbers. Starrett (1951) documented the negative effects of similar high water on the spawning success and resulting abundances of minnows in the Des Moines River where the spotfin shiner and sand shiner (Notropis stramineus), another late spawner, dominated. Increases in catches of the mimic shiner, a species closely related to N. stramineus, are also likely due to its July and August spawning period.

In 1982, discrepancies arose with factors 1, 4, and 6 of the seven key factors for impact assessment proposed in Nardacci and Associates (1981). Factor 1: largest seine catches occur in June. In 1982, largest catches occurred in September. This shift from peak catches in June due to high spottail shiner and white sucker catches to peak catches in fall was due to spotfin shiner dominance and vulnerability to collection. Factor 4: large catches of pumpkinseed and/or bluegill occur at Station 4A2. In addition to being numerous at Station 4A2 in 1982, pumpkinseed and/or bluegill

abundance was high at 13B5, 1A2, and 16A1. Factor 6: Channel catfish are more numerous downstream from the Discharge. Channel catfish abundance in 1982 was greatest at upstream Station 1A2 where most specimens were collected from an intermittent pool. These discrepancies were attributed to the effects of naturally occurring environmental variables on the year class strengths of common resident fishes.

6.3 ELECTROFISHING

6.3.1 METHODS

Electrofishing was conducted in 12 nearshore zones in 1982 (Table 6.3-1 and Figure 6.3-1). All zones were sampled semimonthly March through December. Ice cover prevented sampling in January and February.

The alternating current (AC) electrofisher consisted of a 4.5 kw alternator and a Coffelt VVP-10 variable voltage pulsator mounted in a 6.4 m flat bottom boat. The boat was powered by a 35 hp outboard motor for travel between zones and a 6 hp outboard motor while sampling. Two aluminum booms extended two 0.9 m diameter rolled aluminum hoops about 2 m in front of the boat. Two 1.2 m lengths of flexible conduit were attached to each hoop and suspended in the water as electrodes. Floodlights mounted at the bow increased night visibility. Stunned fish were netted from a wooden deck at the bow which was surrounded by a safety rail. During shocking operations a weight activated safety switch was controlled by one of the biologists netting fish; the boat operator regulated the electrical current and had access to safety switches that deactivate both the pulsator and the alternator.

One downstream pass, as close to shore as possible (1 to 10 m off shore), in a zone constituted a collection. All collections were made after sunset. Data recorded with each collection were start time, duration of sample (in minutes), air and surface water temperatures, dissolved oxygen concentration, pH, conductivity, secchi disc (taken from a standard position under a lamp), output voltage, and amperage.

Fish were placed in tubs treated with TMS (Tricaine methanesulfonate), a fish anesthetic, to facilitate handling and reduce fish injury. To further reduce fish injury, large specimens (>250 mm fork length, FL) of the common carp and quillback were counted by the biologists netting fish and noted on the field sheets. At the end of each collection, the boat was returned to the center of the zone and all fish were measured (to the nearest mm FL) and weighed (to the nearest 1.0 g). Some specimens were retained for radiation analysis as part of the Radiological Environmental Monitoring Program; all other specimens were released including those tagged for movement studies (Section 7.0).

Condition factor (K) was computed for all rock bass, redbreast sunfish, pumpkinseed, smallmouth bass, and walleye from the formula (Weatherley 1972):

$$K = 100 w/L^3$$

where W = weight (g) and L = fork length expressed in cm.

A two factor analysis of variance (ANOVA) was used to test for differences in mean K factors among months (April through November) and years (1976 through 1982) for each of the five fishes. Other months

were not included due to variation in effort and low numbers of fish captured. Duncan's new multiple range test was used to compare means when the ANOVA indicated initial differences (Steel and Torrie 1960).

Species diversity (described in Section 2.0) was calculated for the total catch at each zone and the total monthly catch (all zones combined) from the machine formula of the Shannon-Weaver Information Theory Index.

An index of percent similarity (described in Section 2.0) was used to determine the similarity of species composition among zones. Percent similarity measures the relative similarity of zones in terms of species composition and permits the grouping of zones by dominant or major species.

The ranks of species captured at each zone were compared with Kendall's measure of rank correlation, τ (Conover 1971). This method also permits a grouping of zones by dominant or major species.

Single linkage dendrograms were constructed after the method of Pielou (1977) to compare 1982 percent similarity and Kendall's τ correlations.

The number of fish caught in each collection was divided by the duration of the collection to compute the mean number of fish per minute. Data from 15 sampling periods (two each month April through October, and one in November) each year (1977 through 1982) were used in a three factor ANOVA. Data from mid-November through March were excluded because of inconsistent effort due to high river flow and/or ice cover. Data from 1976 were not included because

Zone 13A1 was not sampled in April. The ANOVA was used to determine if significant differences existed in mean number of fish per minute among years, zones, and sampling periods. Duncan's new multiple range test was used to compare means when the ANOVA indicated initial differences.

A stepwise multiple regression was used to determine which independent variables (environmental parameters) best predict the dependent (Y) variable, number of fish per minute. The independent variables selected were water temperature; river flow; conductivity; secchi disc; output voltage; and a shock factor which related amps, volts, and conductivity.

6.3.2 RESULTS

A list of scientific and common names of fishes captured near TMINS since 1974 appears in Table 6.1-2. Numbers of fishes collected by the electrofisher each month in 1982 are presented in Tables 6.3-2 through 6.3-11 and summarized in Tables 6.3-12 and 6.3-13. A total of 6,341 specimens of 27 fishes and one hybrid was captured in 240 collections.

Centrarchids comprised 72.1% of the total catch (Table 6.3-12). Five species, the rock bass, redbreast sunfish, pumpkinseed, bluegill, and smallmouth bass accounted for 68.8% of the catch. The pumpkinseed (1,444 specimens, 22.8% of the total catch) was most abundant. It ranked first in May and August through December; second in April, June, and July; and fourth in March (Table 6.3-13). The smallmouth bass (995, 15.7%) was second in overall abundance. It ranked

first in June, second in May and October, third in November, fourth in March and July through September, and fifth in December. The redbreast sunfish (857, 13.5%) was third in abundance and ranked first in July; third in May, August, September, and December; fourth in June and November; and fifth in October. The rock bass (745, 11.7%) was fourth in abundance. It was first in April; second in March, November, and December; third in June; fourth in October; and fifth in May and July. The bluegill (322, 5.1%) was seventh in overall abundance and ranked fourth in May and fifth in August. Four other centrarchids (green sunfish, largemouth bass, white crappie, and black crappie) and a Lepomis hybrid accounted for 3.3% of the total catch.

Four catostomids (the quillback, white sucker, northern hog sucker, and shorthead redhorse) accounted for 15.4% of the total catch (Table 6.3-12). The quillback (716 specimens, 11.3%) was fifth in overall abundance and ranked first in March; second in August and September; third in April, July, and October; and fifth in November (Table 6.3-13). The white sucker (125, 2.0%) was ninth in abundance; the shorthead redhorse (123, 1.9%) tenth in abundance ranked fifth in April and June.

Two percids (the yellow perch and walleye) comprised 6.9% of the total catch (Table 6.3-12). The walleye (405 specimens, 6.4%) was sixth in overall abundance ranking fourth in April and December and fifth in September (Table 6.3-13).

Three cyprinids (the common carp, golden shiner, and fallfish) accounted for 3.5% of the total catch (Table 6.3-12). The common carp (181 specimens, 2.9%) was eighth in overall abundance and ranked third in March (Table 6.3-13).

Two clupeids (the American shad and gizzard shad), one salmonid (brown trout), two esocids (muskellunge and chain pickerel), and four ictalurids (yellow bullhead, brown bullhead, channel catfish, and margined madtom) comprised 2.1% of the total catch (Table 6.3-12).

6.3.2.1 CONDITION FACTOR (K)

Results of the two factor ANOVA for condition factor appear in Table 6.3-14. Significant differences existed among yearly and monthly mean K factors for the five fishes tested; interaction effects were also significant, but the F values were much smaller than the main effects. Duncan's new multiple range test indicated that yearly differences for rock bass, redbreast sunfish, and pumpkinseed were similar (Table 6.3-15). The mean K was significantly larger in 1979 than in other years and smaller than other years in 1981. Smallmouth bass mean K was significantly larger in 1979 and smaller in 1978. For walleye, mean K was significantly larger in 1977; 1981, 1978, and 1982 were similar and significantly smaller than other years.

Monthly mean K factors for rock bass, redbreast sunfish, and pumpkinseed were similar (Table 6.3-16). For all three fishes mean K factor was significantly larger in June. The smallest monthly mean K for rock bass and pumpkinseed occurred in October, while redbreast sunfish mean K was smallest in April. For smallmouth bass and walleye, the largest monthly mean K occurred in July and the smallest in April.

6.3.2.2 SPECIES DIVERSITY

Species diversity indices (H') computed for the 1982 total catch at each zone appear in Table 6.3-12. The smallest H' occurred at Zone

10B1 (2.67) and the largest at 15B2 (3.19). The smallest monthly H' (all zones combined) occurred in June (2.96) and the largest (3.27) in October (Table 6.3-13).

6.3.2.3 PERCENT SIMILARITY

Percent similarity (PSc) values for 1982 are presented in Table 6.3-17. A single linkage dendrogram showing the "nearest neighbor" relationships among zones using PSc is presented in Figure 6.3-2. Placing a straight edge perpendicular to the PSc axis at 75.0 showed that Zones 13A1, 16A2, 10A3, 15A1, and 16B8 formed one group and Zones 11B1, 4A1, and 10B3 formed another group with greater than 75.0 PSc among member zones. From the dendrogram, all zones are linked at a PSc of 71.6. The largest PSc between two zones in 1982 was 85.3 between 16A2 and 13A1; the smallest was 24.5 between 16B8 and 11B1.

6.3.2.4 KENDALL'S TAU (τ)

Kendall's τ correlations were computed among the 12 zones in 1982 (Table 6.3-18). Those τ values marked with an asterisk (*) showed no correlation at $P \leq 0.05$ between the ranks of the species catch at two zones. Those τ values marked with two asterisks (**) were positively correlated at $P \leq 0.05$ but not at $P \leq 0.01$.

A single linkage dendrogram showing the "nearest neighbor" relationships among zones using τ correlation is presented in Figure 6.3-3. Placing a straight edge perpendicular to the τ axis at 0.675 showed that Zones 15A2, 16B8, 10A3, 15A1, 16A2, and 13A1 formed a large group correlated at τ greater than 0.675. Zones 9B5 and 10B1

were correlated with each other, but not with the larger group. From the dendrogram, all zones, except 11B1, had a τ correlation greater than 0.60 with at least one other zone. The vertical line in Figure 6.3-3 indicated the largest τ correlation Zone 11B1 had with another zone (0.51 with 10B3). Zone 11B1 was not connected to the large group of zones because it was not correlated at $P \leq 0.05$ with six zones, and it was not correlated at $P \geq 0.01$ with two zones. The largest τ correlation was 0.84 between Zones 16A2 and 13A1; the smallest was 0.15 between Zones 16A2 and 11B1.

6.3.2.5 NUMBERS OF FISH PER MINUTE

The yearly mean numbers of fish per minute (all dates) captured at the 12 electrofishing zones (1976 through 1982) are illustrated in Figure 6.3-4. Results of the three factor ANOVA are presented in Table 6.3-19. All factors were significant ($P \leq 0.05$). Interactions were also significant, but to a lesser extent than the main effects. Results of Duncan's new multiple range test for years, sampling periods, and zones are presented in Tables 6.3-20 through 6.3-22. The largest yearly mean number of fish per minute occurred in 1981 (2.18); 1978 (2.15), 1979 (2.00), and 1977 (1.96) were similar to 1981 and all were significantly larger than 1982 (1.83). All years were significantly larger than 1980 (1.59). Among sampling periods, the second April, first May, and both October dates had the largest means, while both June, both July, and the first August dates had the smallest means. Among zones, 10A3 (2.50) and 16A2 (2.47) were similar and significantly larger than most zones, while 15A2 (1.31) and 10B1 (1.33) were similar and significantly smaller than all other zones.

6.3.2.6 STEPWISE MULTIPLE REGRESSION

The stepwise multiple regression was used to determine if some of the environmental parameters measured with each collection might predict mean number of fish per minute. The independent variables used to analyze 1982 data accounted for only 17.7% of the variability in number of fish per minute. The relationship between number of fish per minute and the independent variables is probably non-linear.

6.3.3 DISCUSSION

6.3.3.1 CONDITION FACTOR (K)

Results of the two factor ANOVA for condition factor (K) indicated monthly and yearly differences. For rock bass, redbreast sunfish, and pumpkinseed; the largest monthly mean K occurred in June. Many of these fishes captured in June were ripe adults; the maximum K values probably reflected gonadal maturation. For smallmouth bass and walleye the largest monthly mean K occurred in July; June, August, and September were also large. This may indicate that summer is the maximum growth season for these fishes in York Haven Pond. Various authors have indicated that most growth of smallmouth bass (Coble 1975, Forney 1972) and walleye (Kelso 1973, Kelso and Ward 1972, Rawson 1957) occurs during warmer summer months.

Yearly mean K values for fish captured April through November probably reflected differences in the monthly abundances of the fishes from year to year and not a change in condition over time.

6.3.3.2 SPECIES DIVERSITY

The diversity index (H') is a measure of the evenness of species distribution. The low H' at Zone 10B1 resulted from the dominance of the pumpkinseed (34.7%) and quillback (25.4%) at that zone (Table 6.3-12). Zone 10B1 is shallow with a mud bottom and little cover (Table 6.3-1). Conversely, Zone 15B2 had the largest number of specimens (849) distribution among 18 species. The distribution of numbers taken were more even and H' was larger (3.19). Zone 15B2 was deeper than 10B1 with many boulders and rubble and a gravel bottom.

Among months, June had the smallest H' and October had the largest (Table 6.3-13). The June catch was dominated by the smallmouth bass (39.9%), while most other species comprised less than 10% of the catch. During October the catch was more evenly distributed among species.

6.3.3.3 NUMBERS OF FISH PER MINUTE

The three factor ANOVA for mean numbers of fish per minute showed yearly (8.23), sampling period (20.08), and zone (13.85) differences (Table 6.3-19). The 1982 mean number of fish per minute (1.83) was significantly larger than 1980 (1.59) but smaller than all other years. The low mean number of fish per minute during 1980 was probably due to drought conditions which existed in the Susquehanna Basin (Nardacci and Associates 1981). The reason(s) for low numbers of fish per minute in 1982 was not readily apparent.

Among sampling periods, the largest means were found in fall (both October dates) and spring (late April and early May), while the smallest was found in summer (June through early August). Fish abundance in the nearshore electrofishing zones may be linked to seasonal changes in environmental parameters (water temperature, river flow, and secchi disc). These factors were the first entered in the stepwise multiple regression; however, they accounted for only 11.9% of the variability in mean number of fish per minute (multiple $R = 0.3462$).

Differences among zones may be due to habitat preferences. The smallest mean numbers of fish per minute were found at Zones 15A2, 10B1 and 9B5; all three zones had mud bottoms and little cover (Table 6.3-1). The largest means were found at Zones 10A3, 16A2, and 16B8 which had sand, gravel, and/or rubble bottoms and cover in the form of boulders, fallen trees, and emergent vegetation. Juvenile and adult centrarchids (the most abundant family in electrofishing collections in York Haven Pond) generally prefer areas with sand, gravel, or rubble bottom and cover (Carlander 1977, Scott and Crossman 1973). The larger mean numbers of fish per minute at Zones 10A3, 16A2, and 16B8 probably reflect the greater abundance of centrarchids in these zones due to the presence of preferred habitat.

6.3.4 SUMMARY

To summarize, differences in species composition and abundance among zones, sampling periods, and years are probably due to habitat differences, changes in river flow and water temperature, and natural fluctuations inherent in fish populations. There is little evidence that TMINS had any effect on the distribution and abundance of fishes in zones sampled by the AC electrofisher.

Table 6.1-1

Location and description of trapnet stations sampled in 1982.

Station Number	Location and Description
TM-AQF-1A3*	Southwest shore of St. Johns Island. Offshore gravel bars which supported water willow (<u>Justicia americana</u>) reduced river flow and created a backwater in summer. Small amounts of curly pond weed (<u>Potamogeton crispus</u>) were located just downstream from the gravel bars in summer. The area often received flow from the east channel. The shore dropped quickly to a hard mud bottom.
TM-AQF-11A2	West shore of TMI, 20 m downstream from Discharge. The station received strong current and turbulence from the Discharge located just upstream. A slight to moderate backwater was present. The shore sloped gradually over a hard mud and gravel bottom.
TM-AQF-11A3	West shore of TMI, 200 m downstream from Discharge. This station was unprotected from strong river flows. The bottom was composed of gravel and pebbles and sloped gradually.
TM-AQF-9B2	West shore of TMI, 1900 m downstream from Discharge. The station was protected from strong river flows by a backwater created by York Haven Dam. The bottom had a gentle slope and was composed of mud.

* Prefix TM-AQF- deleted from station numbers for discussion in text.

Table 6.1-2

List of scientific and common names of fishes collected by Ichthyological Associates, Inc. from the Susquehanna River near THDS since 1974.

Scientific Name	Common Name
Amiidae	Bowfins
<i>Amia naja</i> Linnaeus	Bowfin
Anguillidae	Freshwater eels
<i>Anguilla rostrata</i> (Lesueur)	American eel
Clupeidae	Herrings
<i>Alosa aestivalis</i> (Mitchill)	Blueback herring
<i>Alosa pseudoharengus</i> (Wilson)	Alewife
<i>Alosa sapidissima</i> (Wilson)	American shad
<i>Coregonus artedii</i> (Lesueur)	Gizzard shad
Salmonidae	Trouts
<i>Salmo gairdneri</i> Richardson	Rainbow trout
<i>Salmo trutta</i> Linnaeus	Brown trout
<i>Salvelinus fontinalis</i> (Mitchill)	Brook trout
Esocidae	Pikes
<i>Esox lucius</i> Linnaeus	Northern pike
<i>Esox niger</i> Lesueur	Muskellunge
<i>Esox niger</i> Lesueur	Chain pickerel
Cyprinidae	Carp and Minnows
<i>Crematogaster anomala</i> (Rafinesque)	Central stoneroller
<i>Lepomis gibbosus</i> (Linnaeus)	Goldfish
<i>Cyprinus carpio</i> Linnaeus	Common carp
<i>Notropis cornutus</i> (Lesueur)	Cutlips minnow
<i>Notropis microgaster</i> (Cope)	River chub
<i>Notropis crysoleucas</i> (Mitchill)	Golden shiner
<i>Notropis cornutus</i> (Abbott)	Comely shiner
<i>Notropis cornutus</i> (Mitchill)	Common shiner
<i>Notropis hudsonius</i> (Clinton)	Spottail shiner
<i>Notropis procerus</i> (Cope)	Swallowtail shiner
<i>Notropis rubellus</i> (Agassiz)	Roseface shiner
<i>Notropis spilopterus</i> (Cope)	Spottin shiner
<i>Notropis volucellus</i> (Cope)	Mimic shiner
<i>Pimephales notatus</i> (Rafinesque)	Bluntnose minnow
<i>Pimephales promelas</i> Rafinesque	Fathead minnow
<i>Rhinichthys atratulus</i> (Hermann)	Blacknose dace
<i>Rhinichthys cataractae</i> (Valeenciennes)	Longnose dace
<i>Semotilus atropaculus</i> (Mitchill)	Creek chub
<i>Semotilus atropaculus</i> (Mitchill)	Fallfish
Catostomidae	Suckers
<i>Catostomus commersoni</i> (Lesueur)	Quillback
<i>Catostomus commersoni</i> (Lacépède)	White sucker
<i>Hypostelium nigricans</i> (Lesueur)	Northern hog sucker
<i>Hypostelium nigricans</i> (Lesueur)	Shorthead redhorse
Ictaluridae	Bullhead catfishes
<i>Ictalurus punctatus</i> (Linnaeus)	White catfish
<i>Ictalurus natalis</i> (Lesueur)	Yellow bullhead
<i>Ictalurus nebulosus</i> (Lesueur)	Brown bullhead
<i>Ictalurus punctatus</i> (Rafinesque)	Channel catfish
<i>Noturus inaequalis</i> (Richardson)	Margined madtom
Cyprinodontidae	Killifishes
<i>Fundulus diaphanus</i> (Lesueur)	Banded killifish
Gasterosteidae	Sticklebacks
<i>Gasterosteus aculeatus</i> (Kirtland)	Brook stickleback
Percichthyidae	Temperate basses
<i>Morone americana</i> (Gmelin)	White perch
<i>Morone saxatilis</i> (Walbaum)	Striped bass
Centrarchidae	Sunfishes
<i>Ambloplites rupestris</i> (Rafinesque)	Rock bass
<i>Lepomis auritus</i> (Linnaeus)	Redbreast sunfish
<i>Lepomis cyanellus</i> Rafinesque	Green sunfish
<i>Lepomis gibbosus</i> (Linnaeus)	Pumpkinseed
<i>Lepomis macrochirus</i> Rafinesque	Bluegill
<i>Micropterus dolomieu</i> Lacépède	Smallmouth bass
<i>Micropterus salmoides</i> (Lacépède)	Largemouth bass
<i>Pomoxis annularis</i> Rafinesque	White crappie
<i>Pomoxis nigromaculatus</i> (Lesueur)	Black crappie
Percidae	Perches
<i>Etheostoma almeri</i> Storer	Tessellated darter
<i>Etheostoma opale</i> (Cope)	Banded darter
<i>Perca flavescens</i> (Mitchill)	Yellow perch
<i>Perca palmaria</i> (Stauffer)	Shield darter
<i>Stizostedion vitreum vitreum</i> (Mitchill)	Walleye

Table 6.1-3

Fishes taken by trapnet on 9-11 March 1982 near IMDE.

Station	IM-AQF-1A3		IM-AQF-11A2		IM-AQF-11A3		IM-AQF-9B2		Total	Σ Catch
	9-10 1341-1334	10-11 1336-1331	9-10 1355-1347	10-11 1353-1345	9-10 1403-1405	10-11 1407-1358	9-10 1420-1424	10-11 1426-1420		
Air Temp (C)	5.5, 1.5	1.5, 9.5	5.5, 1.0	1.0, 10.5	6.0, 1.5	1.5, 10.0	5.0, 2.5	2.5, 11.0		
Water Temp (C)	2.5, 2.0	2.0, 3.0	2.5, 2.0	2.0, 3.0	2.5, 2.0	2.0, 3.5	2.5, 2.0	2.0, 3.5		
Dissolved Oxygen (mg/l)	12.4, 11.0	11.0, 13.5	12.6, 11.0	11.0, 13.7	12.7, 11.0	11.0, 13.6	12.6, 11.1	11.1, 12.4		
pH	7.8, 8.1	8.1, 8.1	8.1, 8.1	8.1, 8.0	8.1, 8.0	8.0, 7.9	8.1, 8.0	8.0, 8.0		
Secchi Disc (cm)	20, 71	71, 81	20, 66	66, 91	15, 71	, 89	15, 71	71, 86		
River Stage (m)	1.34, 1.33	1.33, 1.36	1.34, 1.33	1.33, 1.30	1.34, 1.33	1.33, 1.30	1.36, 1.33	1.33, 1.30		
Weather	Clear, Snow	Snow, Haze	Clear, Snow	Snow, Haze	Clear, Snow	Snow, Haze	Clear, Overcast	Overcast, Haze		
No. of Specimens	7	8	11	10	12	5	4	5	62	
No. of Species	5	4	6	6	7	3	4	4	14	
Spottail shiner	2	5	5	4	3	1	-	-	20	32.3
Fallfish	-	-	1	-	-	-	-	1	2	3.2
Quillback	1	-	-	-	-	-	1	-	2	3.2
White sucker	-	-	-	-	1	-	1	-	2	3.2
Northern hog sucker	-	-	1	1	1	-	-	-	3	4.8
Shorthead redhorse	-	1	1	2	1	2	1	-	8	12.9
Channel catfish	2	-	2	1	4	2	-	-	11	17.7
Rock bass	1	-	-	-	-	-	-	-	1	1.6
Pumpkinseed	-	1	-	1	-	-	-	-	2	3.2
Bluegill	-	1	-	-	-	-	-	-	1	1.6
Smallmouth bass	-	-	-	-	1	-	-	-	1	1.6
White crappie	-	-	-	1	-	-	-	2	3	4.8
Black crappie	-	-	-	-	-	-	-	1	1	1.6
Walleye	1	-	1	-	1	-	1	1	5	8.1

Table 6.1-4

Fishes taken by trapnet on 14-16 April 1982 near TMDb.

Station	TM-AQF-1A3		TM-AQF-11A2		TM-AQF-11A3		TM-AQF-9B2		Total	% Catch
	14-15 Time	15-16 0954-0957	14-15 0932-0931	15-16 0935-0931	14-15 0922-0915	15-16 0914-0920	14-15 0909-0859	15-16 0902-0859		
Air Temp (C)	8.0, 12.5	12.5, 12.5	9.0, 12.5	12.5, 11.0	9.0, 12.5	12.5, 10.5	10.0, 10.0	10.0, 10.0		
Water Temp (C)	7.5, 8.5	8.5, 9.5	8.0, 8.5	8.5, 9.5	8.0, 8.5	8.5, 9.5	7.5, 8.0	8.0, 9.0		
Dissolved Oxygen (mg/l)	11.2, 11.4	11.6, 10.8	11.6, 11.6	11.6, 11.0	11.5, 11.4	11.6, 11.0	11.5, 11.4	11.4, 11.0		
pH	8.1, 8.1	8.1, 8.4	8.1, 8.0	8.0, 8.2	8.0, 7.9	7.9, 8.3	8.1, 8.0	8.0, 8.2		
Secchi Disc (cm)	81, 90	90, 86	71, 74	74, 61	76, 86	86, 66	89, 89	89, 61		
River Stage (m)	1.93, 1.93	1.93, 1.91	1.93, 1.93	1.93, 1.91	1.93, 1.93	1.93, 1.91	1.93, 1.93	1.93, 1.91		
Weather	Clear, Clear	Clear, Overcast	Clear, Clear	Clear, Overcast	Clear, Clear	Clear, Overcast	Clear, Clear	Clear, Overcast		
No. of Specimens	3	5	4	5	7	-	1	2	27	
No. of Species	3	4	3	3	3	-	1	2	9	
Common carp	-	-	-	-	-	-	-	-	1	3.7
Spottail shiner	-	1	-	-	4	NO	-	-	5	18.5
Channel catfish	-	-	1	-	-	-	-	-	2	7.4
Rock bass	-	1	1	1	2	-	-	1	6	22.2
Pumpkinseed	-	1	-	-	-	FISH	-	-	1	3.7
Smallmouth bass	-	-	-	1	-	-	1	-	2	7.4
White crappie	1	2	-	-	1	-	-	-	4	14.8
Black crappie	-	-	2	3	-	TAKEN	-	-	5	18.5
Yellow perch	-	-	-	-	-	-	-	1	1	3.7

Table 6.1-5

Fishes taken by trapnet on 21-23 April 1982 near TMDb.

Station	TM-AQF-1A3		TM-AQF-11A2		TM-AQF-11A3		TM-AQF-9B2		Total	% Catch
	21-22 Time	22-23 1011-0946	21-22 0930-0929	22-23 1000-0927	21-22 0922-0915	22-23 0921-0913	21-22 0905-0850	22-23 0856-0853		
Air Temp (C)	13.5, 11.0	11.0, 12.0	13.5, 10.0	10.0, 12.0	13.0, 10.0	10.0, 11.5	13.0, 10.5	10.5, 11.0		
Water Temp (C)	13.0, 12.0	12.0, 11.0	13.0, 12.0	12.0, 11.5	12.5, 12.0	12.0, 11.5	12.5, 11.5	11.5, 11.0		
Dissolved Oxygen (mg/l)	9.6, 10.0	10.0, 10.2	9.8, 10.3	10.3, 10.6	9.9, 10.2	10.2, 10.5	9.8, 10.0	10.0, 10.4		
pH	8.1, 7.8	7.8, 7.8	8.1, 8.0	8.0, 7.8	8.1, 7.8	7.9, 8.1	8.4, 8.1	8.1, 8.2		
Secchi Disc (cm)	15, 18	18, 30	13, 18	18, 28	15, 18	18, 30	18, 18	18, 30		
River Stage (m)	2.06, 1.96	1.96, 1.82	2.06, 1.96	1.96, 1.82	2.06, 1.96	1.96, 1.82	2.06, 1.96	1.96, 1.82		
Weather	Partly Cloudy, Clear	Clear, Clear	Partly Cloudy, Clear	Clear, Clear	Partly Cloudy, Clear	Clear, Clear	Overcast, Partly Cloudy	Partly Cloudy, Clear		
No. of Specimens	11	15	7	7	2	9	19	7	97	
No. of Species	7	6	6	4	4	4	5	4	17	
Common carp	-	1	-	-	-	-	1	-	1	1.0
Golden shiner	-	-	1	-	-	-	-	-	1	1.0
Spottail shiner	-	-	-	-	-	-	6	-	6	6.2
Gillback	-	-	-	-	-	-	-	-	2	2.1
White sucker	-	-	1	1	-	-	-	-	2	2.1
White catfish	-	-	-	-	-	-	2	-	2	2.1
Brown bullhead	1	-	-	-	-	-	-	-	1	1.0
Channel catfish	1	-	18	4	-	-	9	2	34	35.1
Rock bass	2	3	4	-	-	6	1	2	18	18.6
Redbreast sunfish	1	1	-	1	-	-	-	-	3	3.1
Pumpkinseed	1	5	-	-	-	-	-	2	8	8.2
Bluegill	-	-	-	-	-	-	-	1	1	1.0
Smallmouth bass	-	-	1	-	-	-	-	-	1	1.0
Largemouth bass	-	-	-	-	1	1	-	-	2	2.1
White crappie	1	1	-	-	1	1	-	-	4	4.1
Black crappie	4	4	-	1	1	1	-	-	11	11.3
Halleve	-	-	2	-	-	-	-	-	2	2.1

Table 6.1-6

Fishes taken by trapnet on 3-5 May 1982 near IMINS.

Station	IM-AQF-1A3		IM-AQF-11A2		IM-AQF-11A3		IM-AQF-982		Total	% Catch
	3-4	4-5	3-4	4-5	3-4	4-5	3-4	4-5		
Date	0942-0954	0956-0952	0927-0938	0940-0935	0914-0923	0935-0916	0900-0853	0856-0868		
Air Temp (C)	16.5, 16.5	16.5, 15.0	16.5, 16.5	16.5, 14.0	16.5, 16.0	16.0, 15.0	16.0, 15.5	15.5, 14.5		
Water Temp (C)	15.5, 16.0	16.0, 16.5	15.5, 16.5	16.5, 16.5	15.0, 16.0	16.0, 16.0	15.0, 16.0	16.0, 16.5		
Dissolved Oxygen (mg/l)	9.4, 9.8	9.8, 9.4	9.4, 9.7	9.7, 9.7	9.6, 9.8	9.8, 9.5	9.4, 9.8	9.8, 9.4		
pH	8.2, 7.8	7.8, 7.8	7.6, 8.0	8.0, 7.8	8.0, 8.0	8.0, 7.9	7.9, 8.1	8.1, 7.9		
Secchi Disc (cm)	61, 94	94, 89	41, 91	91, 79	66, 89	89, 81	76, 104	104, 86		
River Stage (m)	1.39, 1.35	1.35, 1.32	1.39, 1.35	1.35, 1.32	1.39, 1.35	1.35, 1.32	1.39, 1.35	1.35, 1.32		
Weather	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear		
No. of Specimens	9	11	12	13	1	18	51	44	159	
No. of Species	2	7	2	7	1	6	10	6	12	
Common carp	-	1	-	-	-	-	1	-	2	1.3
Spottail shiner	-	-	-	-	-	-	-	1	1	0.6
Shorthead redhorse	-	-	-	1	-	-	1	-	2	1.3
White catfish	-	-	-	1	-	1	-	-	2	1.3
Brown bullhead	-	1	-	1	-	-	2	-	4	2.5
Channel catfish	-	1	-	-	-	2	2	-	5	3.1
Rock bass	-	2	-	2	-	3	2	2	11	6.9
Redbreast sunfish	-	2	1	-	-	2	1	-	6	3.8
Pumpkinseed	8	3	10	4	1	5	10	6	47	29.6
Bluegill	-	-	-	-	-	-	4	11	15	9.4
Lepomis hybrid	-	-	1	-	-	-	-	-	1	0.6
White crappie	-	1	-	3	-	-	17	14	35	22.0
Black crappie	1	-	-	1	-	5	17	10	28	17.6

Table 6.1-7

Fishes taken by trapnet on 17-19 May 1982 near IMINS.

Station	IM-AQF-1A3		IM-AQF-11A2		IM-AQF-11A3		IM-AQF-982		Total	% Catch
	17-18	18-19	17-18	18-19	17-18	18-19	17-18	18-19		
Date	0956-1008	1010-1009	0930-0942	0945-0945	0921-0927	0930-0929	0906-0851	0853-0857		
Air Temp (C)	23.5, 19.0	19.0, 20.5	23.0, 19.0	19.0, 20.0	22.5, 19.5	19.5, 20.5	21.0, 19.5	19.5, 21.5		
Water Temp (C)	22.0, 22.5	22.5, 22.5	22.0, 22.5	22.5, 22.5	22.0, 22.5	22.5, 22.5	22.0, 22.5	22.5, 23.0		
Dissolved Oxygen (mg/l)	8.0, 9.0	9.0, 8.2	8.1, 9.3	9.3, 8.6	7.8, 8.6	8.6, 8.5	7.8, 9.3	9.3, 8.5		
pH	8.4, 7.9	7.9, 7.8	8.5, 8.0	8.0, 7.8	8.4, 7.9	7.9, 7.8	8.0, 8.1	8.1, 7.9		
Secchi Disc (cm)	71, 104	104, 94	64, 102	102, 91	69, 109	109, 89	64, 107	107, 81		
River Stage (m)	1.23, 1.20	1.20, 1.19	1.23, 1.20	1.20, 1.19	1.23, 1.20	1.20, 1.19	1.23, 1.20	1.20, 1.19		
Weather	Clear, Haze	Haze, Haze	Clear, Haze	Haze, Haze	Clear, Haze	Haze, Haze	Clear, Haze	Haze, Haze		
No. of Specimens	21	14	59	24	8	9	121	89	345	
No. of Species	6	5	5	3	3	4	6	5	11	
Common carp	2	-	-	-	-	-	-	-	2	0.6
White catfish	-	-	-	-	1	-	-	-	1	0.3
Brown bullhead	1	-	-	-	-	-	-	-	1	0.3
Channel catfish	-	-	-	-	-	1	1	-	2	0.6
Rock bass	2	1	1	-	4	3	-	-	11	3.2
Redbreast sunfish	1	1	-	-	-	-	-	1	3	0.9
Green sunfish	-	-	-	-	-	-	1	-	1	0.3
Pumpkinseed	12	10	54	21	3	4	105	74	283	82.0
Bluegill	-	-	1	1	-	1	9	5	7	4.9
White crappie	-	1	1	-	-	-	3	5	10	2.9
Black crappie	3	1	2	2	-	-	2	4	14	4.1

Table 6.1-8

Fishes taken by trapnet on 1-3 June 1982 near TMNS.

Station	TM-AQF-1A3		TM-AQF-11A2		TM-AQF-11A3		TM-AQF-9B2		Total	% Catch
	1-2 1000-1014	2-3 1021-0958	1-2 0949-0948	2-3 0955-0934	1-2 0935-0924	2-3 0929-0914	1-2 0918-0851	2-3 0855-0851		
Date										
Time										
Air Temp (C)	20.0, 19.0	19.0, 21.0	19.5, 18.0	18.0, 20.5	19.5, 18.0	18.0, 19.5	19.5, 18.0	18.0, 17.5		
Water Temp (C)	23.0, 21.0	21.0, 21.5	23.5, 21.0	21.0, 21.5	23.0, 21.0	21.0, 21.5	23.0, 21.0	21.0, 21.5		
Dissolved Oxygen (mg/l)	8.0, 8.1	8.1, 8.5	7.9, 8.3	8.3, 8.7	7.9, 8.1	8.1, 8.7	8.1, 8.0	8.0, 8.5		
pH	7.7, 7.8	7.8, 8.1	7.9, 7.8	7.8, 8.0	7.7, 7.9	7.9, 8.1	7.7, 7.9	7.9, 8.2		
Secchi Disc (cm)	51, 25	25, 51	56, 23	23, 30	56, 25	25, 30	66, -	36, 51		
River Stage (m)	1.66, 1.66	1.66, 1.73	1.66, 1.66	1.66, 1.73	1.66, 1.66	1.66, 1.73	1.66	1.66, 1.73		
Weather	Fog, Clear	Clear, Partly Cloudy	Fog, Clear	Clear, Partly Cloudy	Fog, Clear	Clear, Partly Cloudy	Clear, Clear	Clear, Partly Cloudy		
No. of Specimens	31	50	10	4	7	7	13	20	142	
No. of Species	8	8	6	4	3	5	5	6	14	
Common carp	7	1	1	-	1	-	1	-	11	7.7
Tiger chub	-	-	-	-	-	-	-	1	1	0.7
Quillback	3	-	-	-	-	-	-	-	3	2.1
White sucker	-	1	-	-	-	-	-	-	1	0.7
White catfish	-	-	-	-	-	1	-	-	1	0.7
Brown bullhead	4	-	-	-	-	-	2	2	8	5.6
Channel catfish	-	1	3	1	3	-	-	-	8	5.6
Rock bass	2	2	1	1	3	3	-	1	13	9.2
Redbreast sunfish	-	-	2	-	-	-	-	-	2	1.4
Pumpkinseed	11	34	-	-	-	1	1	6	53	37.3
Bluegill	-	3	-	-	-	1	-	-	4	2.8
White crappie	1	1	1	1	-	-	4	2	15	10.6
Black crappie	2	7	2	1	-	1	5	3	21	14.8
Yellow perch	1	-	-	-	-	-	-	-	1	0.7

Table 6.1-9

Fishes taken by trapnet on 23-25 June 1982 near TMNS.

Station	TM-AQF-1A3		TM-AQF-11A2		TM-AQF-11A3		TM-AQF-9B2		Total	% Catch
	23-24 0939-1039	24-25 1082-1037	23-24 0921-1018	24-25 1022-1016	23-24 0912-0956	24-25 0959-1000	23-24 0906-0923	24-25 0926-0902		
Date										
Time										
Air Temp (C)	19.0, 22.5	22.5, 21.0	19.0, 21.5	21.5, 21.5	18.5, 20.0	20.0, 21.0	18.5, 19.5	19.5, 18.0		
Water Temp (C)	20.5, 22.0	22.0, 21.5	20.5, 21.5	21.5, 21.5	20.5, 21.5	21.5, 21.0	20.5, 21.0	21.0, 21.0		
Dissolved Oxygen (mg/l)	8.5, 8.4	8.4, 9.9	8.4, 8.6	8.6, 9.6	8.5, 8.4	8.4, 9.5	8.5, 8.2	8.2, 9.0		
pH	7.4, 7.6	7.6, 8.0	7.4, 7.6	7.6, 7.5	7.4, 7.6	7.6, 7.6	7.4, 7.9	7.9, 7.6		
Secchi Disc (cm)	28, 64	64, 48	28, 48	48, 36	30, 53	53, 38	33, 66	66, 66		
River Stage (m)	1.52, 1.46	1.66, 1.60	1.52, 1.66	1.66, 1.60	1.52, 1.66	1.66, 1.60	1.52, 1.66	1.66, 1.60		
Weather	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear	Clear, Clear		
No. of Specimens	3	28	12	23	30	16	38	66	196	
No. of Species	2	9	8	6	7	6	8	7	13	
Common carp	-	1	-	-	-	-	1	-	2	1.0
Golden shiner	-	-	-	-	-	-	-	1	1	0.5
Sportin shiner	-	-	-	-	2	-	-	-	2	1.0
Quillback	-	1	-	-	1	-	-	-	2	1.0
White sucker	-	-	-	-	1	-	-	-	1	0.5
Yellow bullhead	-	-	1	-	1	-	3	1	6	3.1
Brown bullhead	-	-	1	-	-	-	-	-	2	1.0
Channel catfish	-	1	1	1	1	1	2	2	10	7.7
Rock bass	-	1	3	1	5	1	-	-	10	7.7
Redbreast sunfish	-	1	1	1	-	-	-	-	3	1.5
Pumpkinseed	2	14	1	10	-	4	14	20	65	33.2
Bluegill	1	3	1	5	-	1	2	2	15	7.7
White crappie	-	4	3	4	5	2	8	6	37	16.3
Black crappie	-	2	1	2	15	6	7	14	47	24.0
Yellow perch	-	-	-	-	-	-	1	-	1	0.5

Table 6.1-10

Fishes taken by trapnet on 7-9 July 1982 near THINS.

Station	TH-AQF-1A3		TH-AQF-11A2		TH-AQF-11A3		TH-AQF-9B2		Total	% Catch
	7-8	8-9	7-8	8-9	7-8	8-9	7-8	8-9		
Date	7-8	8-9	7-8	8-9	7-8	8-9	7-8	8-9		
Time	0945-1005	1007-0960	0954-0947	0951-0922	0927-0930	0933-0907	0917-0900	0902-0844		
Air Temp (C)	25.0, 28.5	28.5, 25.5	25.0, 27.5	27.5, 25.5	24.5, 27.5	27.5, 25.0	24.5, 27.5	27.5, 24.5		
Water Temp (C)	21.5, 25.5	25.5, 25.5	23.5, 25.5	25.5, 25.5	23.5, 25.5	25.5, 25.5	23.5, 25.0	25.0, 25.5		
Dissolved Oxygen (mg/l)	8.3, 8.6	8.6, 8.5	8.2, 8.7	8.7, 8.3	8.7, 8.5	8.5, 8.2	8.2, 8.2	8.2, 8.3		
pH	8.0, 7.5	7.5, 8.4	8.2, 7.8	7.8, 8.1	8.0, 7.6	7.6, 8.0	7.6, 7.6	7.6, 8.0		
Secchi Disc (cm)	48, 53	53, 30	51, 51	51, 36	53, 53	53, 36	48, 56	58, 43		
River Stage (m)	1.39, 1.33	1.33, 1.28	1.39, 1.33	1.33, 1.28	1.39, 1.33	1.33, 1.28	1.39, 1.33	1.33, 1.28		
Weather	Partly Cloudy, Clear	Clear, Hazy	Partly Cloudy, Clear	Clear, Hazy	Partly Cloudy, Hazy	Hazy, Hazy	Partly Cloudy, Hazy	Hazy, Hazy		
No. of Specimens	25	26	12	11	14	12	3	27	164	
No. of Species	5	8	5	7	6	4	6	7	12	
Golden shiner	-	-	-	-	-	-	2	1	3	1.8
Quillback	-	1	-	1	1	-	1	1	5	3.0
White catfish	-	-	-	-	-	-	2	-	1	0.6
Brown bullhead	-	1	-	-	-	-	-	-	1	0.6
Channel catfish	2	-	1	1	-	-	-	-	4	2.4
Rock bass	2	2	1	1	1	2	-	-	9	5.5
Redbreast sunfish	-	1	-	1	-	-	-	-	2	1.2
Pumpkinseed	5	9	-	1	3	1	9	3	31	18.9
Bluegill	-	1	2	1	2	-	-	1	7	4.3
Lepomis hybrid	-	-	-	-	-	-	-	1	1	0.6
White crappie	11	6	4	5	2	5	13	10	56	34.1
Black crappie	5	5	4	-	5	4	11	9	43	26.2
Yellow perch	-	-	-	-	-	-	-	1	1	0.6

Table 6.1-11

Fishes taken by trapnet on 19-21 July 1982 near THINS.

Station	TH-AQF-1A3		TH-AQF-11A2		TH-AQF-11A3		TH-AQF-9B2		Total	% Catch
	19-20	20-21	19-20	20-21	19-20	20-21	19-20	20-21		
Date	19-20	20-21	19-20	20-21	19-20	20-21	19-20	20-21		
Time	1431-1430	1434-1446	1412-1400	1407-1420	1405-1345	1351-1405	1351-1306	1312-1313		
Air Temp (C)	30.5, 24.5	24.5, 26.5	32.5, 25.0	25.0, 25.5	31.5, 25.0	25.0, 25.5	28.5, 27.0	27.0, 25.5		
Water Temp (C)	30.5, 27.5	27.5, 27.0	30.5, 28.0	28.0, 26.5	30.5, 28.0	28.0, 26.5	30.0, 28.0	28.0, 26.5		
Dissolved Oxygen (mg/l)	10.5, 7.9	7.9, 9.3	9.5, 7.8	7.8, 9.1	9.5, 7.6	7.6, 9.0	8.9, 7.0	7.0, 9.4		
pH	8.6, 8.4	8.4, 8.3	8.6, 8.5	8.5, 8.3	8.6, 8.3	8.3, 7.9	8.6, 8.3	8.3, 7.8		
Secchi Disc (cm)	56, 51	51, 51	46, 46	46, 56	51, 46	46, 41	48, 56	56, 58		
River Stage (m)	1.13, 1.12	1.12, 1.12	1.13, 1.12	1.12, 1.12	1.13, 1.12	1.12, 1.12	1.13, 1.12	1.12, 1.12		
Weather	Partly Cloudy, Overcast	Overcast, Clear	Partly Cloudy, Light Rain	Light Rain, Clear	Partly Cloudy, Overcast	Overcast, Clear	Partly Cloudy, Overcast	Overcast, Clear		
No. of Specimens	2	6	35	38	15	11	68	35	210	
No. of Species	1	2	6	6	6	5	5	6	11	
Common carp	-	-	-	1	-	-	-	-	1	0.5
Sportin shiner	-	-	-	-	-	1	-	-	1	0.5
White crappie	-	-	-	-	1	-	-	-	1	0.5
Brown head	-	-	-	-	-	-	3	-	3	1.4
Channel catfish	2	-	-	-	-	-	-	1	3	1.4
Rock bass	-	-	1	3	2	2	-	1	9	4.3
Redbreast sunfish	-	-	1	-	-	-	-	-	1	0.5
Pumpkinseed	-	4	24	23	1	2	31	12	97	46.2
Bluegill	-	-	2	3	2	2	4	4	17	8.1
White crappie	-	-	2	2	2	-	17	8	31	14.8
Black crappie	-	2	5	6	7	4	13	7	46	21.9

Table 6.1-12
Fishes taken by trapnet on 2-6 August 1982 near TWIN.

Station	TP-MQ-1A3	TP-MQ-11A2	TP-MQ-11A1	TP-MQ-9B2	Total	3. catch
Date	2-3	3-4	3-4	2-3	2-3	3-4
Time	1355-1436	1439-1431	1429-1353	1338-1406	1376-1337	1301-1305
Air Temp (°C)	28.0, 25.0	25.0, 29.5	25.0, 28.5	17.5, 25.0	27.5, 25.5	25.5, 28.3
Water Temp (°C)	25.5, 24.5	24.5, 26.5	24.5, 25.5	24.0, 24.5	26.0, 24.5	24.5, 26.5
Dissolved Oxygen (mg/l)	9.6, 7.7	7.7, 11.1	9.5, 9.3	9.5, 7.5	9.6, 7.5	7.5, 10.0
pH	8.5, 7.6	7.6, 8.3	8.2, 8.1	8.1, 7.8	8.0, 8.1	8.1, 8.6
Secchi Disc (cm)	33, 18	18, 28	20, 25	34, 20	36, 20	29, 25
River Stage (m)	1.19, 1.16	1.16, 1.10	1.16, 1.10	1.19, 1.16	1.19, 1.16	1.16, 1.10
Weather	Partly Cloudy Haze	Hazy	Partly Cloudy Haze	Partly Cloudy Haze	Partly Cloudy Haze	Partly Cloudy Hazy
No. of Specimens	3	5	8	6	31	22
No. of Species	3	4	5	5	5	6
Common carp	-	-	-	-	-	1
Golden shiner	-	-	-	-	-	1
Quillback	-	-	-	2	19	2
White sucker	-	1	1	-	-	-
White catfish	-	-	1	-	1	-
Yellow perch	-	-	-	-	-	1
Brown bullhead	-	-	-	1	2	-
Channel catfish	-	1	1	3	-	1
Rock bass	-	2	-	-	-	2
Pumpkinseed	-	-	-	-	-	1
Bluegill	2	-	3	1	1	0.9
White crappie	-	2	2	1	22	19
Black crappie	1	2	1	1	6	6
Saltie	-	-	-	-	-	1

Table 6.1-13

Fishes taken by trapnet on 18-20 August 1982 near TWIN.

Station	TP-MQ-1A3	TP-MQ-11A2	TP-MQ-11A1	TP-MQ-9B2	Total	3. catch
Date	18-19	18-19	18-19	18-19	18-19	19-20
Time	0942-1001	0931-0937	0939-0935	0923-0910	0909-0859	0853-0856
Air Temp (°C)	21.0, 21.5	21.0, 20.0	20.0, 26.0	23.0, 19.0	20.0, 18.5	18.5, 21.0
Water Temp (°C)	23.0, 23.0	23.5, 23.5	23.5, 24.5	23.5, 23.5	24.0, 24.0	24.0, 24.5
Dissolved Oxygen (mg/l)	8.2, 8.3	8.7, 9.4	8.7, 9.4	8.3, 8.6	8.0, 8.3	8.5, 9.2
pH	8.2, 8.6	8.2, 8.2	8.2, 8.3	8.2, 8.9	8.4, 8.7	8.2, 8.6
Secchi Disc (cm)	56, 41	41, 66	36, 36	53, 38	64, 46	48, 46
River Stage (m)	1.01, 1.01	1.01, 1.01	1.01, 1.01	1.01, 1.01	1.01, 1.01	1.01, 1.01
Weather	Clear Clear	Clear Clear	Clear Partly Cloudy	Clear Clear	Clear Clear	Clear Clear
No. of Specimens	21	20	19	16	8	17
No. of Species	6	5	5	8	4	7
Common carp	-	-	-	-	-	1
Golden shiner	-	-	-	3	1	1
Quillback	-	-	-	1	-	-
White sucker	-	-	-	-	-	-
Northern hog sucker	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-
Channel catfish	-	-	1	1	-	-
Rock bass	1	1	2	5	1	6
Brook trout	-	-	-	-	-	-
Redbreast sunfish	-	-	14	9	3	2
Pumpkinseed	11	13	1	1	1	3
Bluegill	2	3	1	1	-	3
White crappie	3	5	1	2	-	8
Black crappie	3	5	1	2	3	5

Table 6.1-14

Fishes taken by trapnet on 1-3 September 1982 near TMDS.

Station	TM-AQF-1A3		TM-AQF-11A2		TM-AQF-11A3		TM-AQF-9B2		Total	% Catch
	1-2	2-3	1-2	2-3	1-2	2-3	1-2	2-3		
Date	1425-1441	1446-1460	1416-1415	1418-1417	1408-1352	1355-1354	1356-1317	1320-1329		
Air Temp (C)	24.5, 29.5	29.5, 25.0	24.0, 27.0	23.0, 24.5	24.5, 27.0	27.0, 25.0	24.0, 30.0	30.0, 25.0		
Water Temp (C)	22.5, 25.5	23.5, 24.0	22.5, 24.0	24.0, 24.5	22.5, 24.0	24.0, 24.5	23.0, 24.5	24.5, 24.5		
Dissolved Oxygen (mg/l)	9.8, 10.7	9.7, 9.2	9.0, 9.6	9.6, 8.4	8.6, 9.4	9.4, 8.2	8.7, 10.4	10.4, 9.8		
pH	8.4, 7.9	7.9, 7.8	8.3, 7.8	7.8, 8.4	8.2, 7.9	7.9, 8.3	8.2, 8.1	8.1, 7.9		
Secchi Disc (cm)	48, 61	61, 28	39, 53	53, 28	43, 56	56, 28	46, 58	58, 33		
River Stage (m)	0.98, 0.97	0.97, 0.98	0.98, 0.97	0.97, 0.90	0.98, 0.97	0.97, 0.98	0.98, 0.97	0.97, 0.98		
Weather	Overcast, Partly Cloudy	Partly Cloudy, Partly Cloudy	Overcast, Partly Cloudy	Partly Cloudy, Partly Cloudy	Overcast, Partly Cloudy	Partly Cloudy, Partly Cloudy	Overcast, Partly Cloudy	Partly Cloudy, Partly Cloudy		
No. of Specimen	10	20	24	19	25	20	55	30	203	
No. of Species	3	5	7	8	6	7	7	5	12	
Common carp	-	-	-	-	-	-	1	-	1	0.5
Spotfin shiner	-	-	-	-	-	1	-	-	1	0.5
Shorthead redhorse	-	-	-	1	-	-	-	-	1	0.5
White catfish	-	1	-	-	1	-	-	-	2	1.0
Channel catfish	-	-	1	2	-	-	2	-	5	2.5
Rock bass	-	-	-	1	3	2	1	2	9	4.4
Redbreast sunfish	-	-	6	2	1	1	-	-	10	4.9
Pumpkinseed	4	15	5	6	18	11	12	12	83	40.9
Bluegill	-	1	1	1	1	1	15	4	24	11.8
White crappie	3	2	2	2	1	2	10	10	32	15.8
Black crappie	3	1	8	4	-	2	14	2	34	16.7
Walleye	-	-	1	-	-	-	-	-	1	0.5

Table 6.1-15

Fishes taken by trapnet on 14-16 September 1982 near TMDS.

Station	TM-AQF-1A3		TM-AQF-11A2		TM-AQF-11A3		TM-AQF-9B2		Total	% Catch
	14-15	15-16	14-15	15-16	14-15	15-16	14-15	15-16		
Date	0967-1006	1006-1001	0935-0950	0952-0946	0923-0932	0934-0929	0909-0915	0917-0920		
Air Temp (C)	21.0, 23.5	23.5, 23.0	21.0, 23.0	23.0, 23.5	21.0, 22.5	22.5, 23.0	20.5, 22.5	22.5, 22.5		
Water Temp (C)	23.5, 23.5	23.5, 23.5	24.0, 24.0	24.0, 24.0	24.0, 24.0	24.0, 24.0	24.5, 24.0	24.0, 23.5		
Dissolved Oxygen (mg/l)	9.4, 9.0	9.0, 8.9	8.7, 9.3	9.3, 8.0	8.2, 9.4	9.4, 7.8	9.2, 9.5	9.5, 8.7		
pH	8.8, 8.3	8.3, 8.4	8.7, 8.6	8.6, 8.4	8.7, 8.4	8.4, 8.3	8.0, 8.7	8.7, 8.5		
Secchi Disc (cm)	41, 64	64, 71	41, 69	69, 74	36, 69	69, 71	53, 76	76, 79		
River Stage (m)	0.94, 0.94	0.94, 0.94	0.94, 0.94	0.94, 0.94	0.94, 0.94	0.94, 0.94	0.94, 0.94	0.94, 0.94		
Weather	Fog, Haze	Haze, Clear	Fog, Haze	Haze, Clear	Fog, Haze	Haze, Clear	Fog, Haze	Haze, Clear		
No. of Specimens	15	19	10	9	18	11	16	36	135	
No. of Species	3	6	6	4	6	5	5	5	10	
Common carp	-	-	-	-	-	1	-	-	1	0.7
Yellow bullhead	-	1	-	-	-	-	-	-	1	0.7
Channel catfish	-	-	-	-	2	1	-	-	3	2.2
Rock bass	-	3	1	3	1	-	1	2	11	8.1
Redbreast sunfish	-	-	1	1	-	1	-	-	3	2.2
Pumpkinseed	6	8	4	4	10	6	8	10	56	41.5
Bluegill	-	2	2	1	3	-	1	11	20	14.8
Largemouth bass	-	-	-	-	1	-	-	-	1	0.7
White crappie	4	2	1	-	-	-	3	7	17	12.6
Black crappie	6	2	1	-	1	2	3	6	22	16.3

Table 6.1-16

Fishes taken by trapnet on 5-7 October 1982 near SHRS.

Station	TH-AQF-1A3		TH-AQF-11A2		TH-AQF-11A3		TH-AQF-9B2		Total	% Catch
	5-6	6-7	5-6	6-7	5-6	6-7	5-6	6-7		
Date	10/5-10/5		10/5-10/5		10/5-10/5		10/5-10/5			
Time	1435-1455		1428-1441		1415-1406		1408-1336			
Air Temp (C)	20.0, 24.5	24.5, 23.5	20.0, 23.5	23.0, 23.5	20.0, 24.0	24.0, 22.5	19.5, 24.0	24.0, 22.5		
Water Temp (C)	19.5, 20.5	20.5, 20.5	19.5, 20.0	20.0, 20.5	19.5, 19.5	19.5, 20.5	20.0, 22.0	22.0, 21.5		
Dissolved Oxygen (mg/l)	9.5, 12.2	12.2, 10.6	5.3, 10.9	10.6, 9.8	9.3, 10.6	10.6, 9.8	9.6, 11.3	11.3, 10.0		
pH	8.5, 8.1	8.1, 8.7	8.1, 7.7	7.7, 8.3	8.1, 7.9	7.9, 8.3	8.0, 8.1	8.1, 8.4		
Secchi disc (cm)	58, 66	60, 53	51, 58	58, 56	61, 56	56, 53	48, 61	61, 56		
River Stage (m)	0.99, 0.98	0.98, 1.09	0.99, 0.98	0.98, 1.09	0.99, 0.98	0.98, 1.09	0.99, 0.98	0.98, 1.09		
Weather	Haze, Haze	Haze, Haze	Haze, Haze	Haze, Haze	Haze, Haze	Haze, Haze	Haze, Haze	Haze, Haze		
No. of Specimens	25	21	37	27	15	10	39	54	228	
No. of Species	5	7	5	5	6	5	7	6	9	
White sucker	-	1	-	-	-	-	-	-	1	0.4
Channel catfish	-	-	-	-	-	-	-	-	3	1.3
Rock Bass	-	-	1	4	2	1	2	-	10	4.4
Redbreast sunfish	1	3	1	1	-	1	-	1	8	3.5
Pumpkinseed	19	8	28	16	8	6	21	16	122	53.5
Bluegill	1	2	-	-	-	-	5	3	11	4.8
Largemouth bass	-	-	-	-	-	-	1	1	2	0.9
White crappie	1	-	4	2	1	-	8	18	34	14.9
Black crappie	3	7	3	4	2	2	1	15	37	16.2

Table 6.1-17

Fishes taken by trapnet on 18-20 October 1982 near THRS.

Station	TH-AQF-1A3		TH-AQF-11A2		TH-AQF-11A3		TH-AQF-9B2		Total	% Catch
	18-19	19-20	18-19	19-20	18-19	19-20	18-19	19-20		
Date	10/18-10/18		10/18-10/18		10/18-10/18		10/18-10/18			
Time	1413-1444		1421-1359		1351-1367		1360-1337			
Air Temp (C)	13.5, 20.0	20.0, 20.5	13.0, 19.0	19.0, 19.0	13.5, 15.0	15.0, 19.0	12.0, 19.5	19.5, 18.5		
Water Temp (C)	11.5, 13.0	13.0, 13.5	10.5, 12.0	12.0, 13.5	10.5, 11.5	11.5, 13.5	11.5, 13.0	13.0, 11.5		
Dissolved Oxygen (mg/l)	10.3, 11.4	11.4, 11.9	10.1, 11.0	11.0, 11.4	10.0, 10.4	10.4, 11.4	10.0, 10.3	10.3, 10.6		
pH	7.8, 7.9	7.9, 8.3	7.8, 7.7	7.7, 8.2	7.7, 7.7	7.7, 8.3	7.8, 7.7	7.7, 8.7		
Secchi disc (cm)	81, 122	122, 61	94, 91	91, 61	97, 106	104, 56	86, 116	114, 71		
River Stage (m)	0.95, 0.96	0.96, 0.96	0.95, 0.96	0.96, 0.96	0.95, 0.96	0.94, 0.96	0.95, 0.96	0.96, 0.96		
Weather	Clear, Clear	Clear, Partly Cloudy	Clear, Clear	Clear, Partly Cloudy	Clear, Clear	Clear, Partly Cloudy	Clear, Clear	Clear, Partly Cloudy		
No. of Specimens	2	4	24	10	44	20	15	5	124	
No. of Species	2	3	4	3	3	5	4	4	9	
American shad	-	1	-	-	-	-	-	-	1	0.8
Spottail shiner	-	-	-	-	-	-	-	1	1	0.8
Yellow perch	-	-	-	1	-	-	-	-	1	0.8
Rock bass	1	-	3	4	10	3	1	1	23	18.5
Redbreast sunfish	-	-	-	-	-	3	-	-	3	2.4
Pumpkinseed	1	2	18	5	32	10	10	1	79	63.2
White crappie	-	-	1	-	2	2	-	2	7	5.6
Black crappie	-	1	2	-	-	2	-	-	7	5.6
Yellow perch	-	-	-	-	-	-	2	-	2	1.6

Table 6.1-14

Fishies taken by trapnet on 3-5 November 1962 near TRRS.

Date Time	TR-APF-1A3		TR-APF-11A2		TR-APF-11A3		TR-APF-9B2		Total	3. Catch
	3-4 0953-0952	5-5 0956-1145	3-5 0940-0936	5-5 0938-1135	3-4 0930-0913	4-5 0917-1010	3-4 0917-0847	6-5 0850-0940		
Air Temp (C)	17.0, 21.5	21.5, 6.0	16.5, 20.5	20.5, 7.0	15.5, 20.5	20.5, 6.5	16.0, 21.0	21.0, 5.0	106	
Water Temp (C)	15.5, 14.5	16.5, 12.5	16.0, 17.5	17.5, 12.5	16.0, 17.5	17.5, 12.5	15.5, 17.0	17.0, 12.5	9	
Dissolved Oxygen (mg/l)	12.5, 13.9	13.9, 10.4	10.6, .5	9.5, 9.6	10.2, 9.7	9.7, 9.5	11.4, 10.2	10.2, 8.9	23	
pH	8.1, 8.2	8.5, 8.0	7.7, 8.0	8.0, 7.6	7.5, 7.5	7.5, 7.7	8.0, 8.2	8.2, 7.6	7	
Secchi Disc (cm)	56, 46	46, 28	56, 56	56, 28	56, 56	56, 28	66, 58	58, 20	25	
River Stage (m)	0.93, 0.93	0.93, 0.97	0.93, 0.93	0.93, 0.97	0.93, 0.93	0.93, 0.97	0.93, 0.93	0.93, 0.97	1	
Weather	Overcast, Fog.	Clear, Overcast.	Fog, Overcast.	Clear, Overcast.	Fog, Overcast.	Clear, Overcast.	Partly Cloudy, Fog.	Partly Cloudy, Partly Cloudy.	19	
No. of Specimens	3	8	11	9	20	14	33	19	106	
No. of Species	6	4	5	4	6	6	8	5	9	
Brown bullhead	-	-	-	-	-	-	-	-	1	0.7
Channel catfish	3	-	-	-	8	9	1	-	23	15.8
Rock bass	-	-	2	-	3	1	1	-	7	4.8
Redbreast sunfish	1	-	-	-	1	1	1	1	4	2.7
Pumpkinseed	10	1	4	4	3	3	9	15	47	32.2
Bluegill	9	4	2	-	-	-	8	-	25	17.1
Lepomis hybrid	1	-	-	-	-	-	-	-	1	0.7
Largemouth bass	-	-	-	-	-	-	-	-	1	0.7
White crappie	3	1	2	2	2	2	2	1	18	12.3
Black crappie	5	2	1	2	3	3	4	1	19	13.0

Table 6.1-15

Fishies taken by trapnet on 16-18 November 1962 near TRRS.

Date Time	TR-APF-1A3		TR-APF-11A2		TR-APF-11A3		TR-APF-9B2		Total	3. Catch
	16-17 0938-0937	17-18 0940-0937	16-17 0927-0924	17-18 0926-0922	16-17 0917-0911	17-18 0913-0910	16-17 0859-0857	17-18 0900-0854		
Air Temp (C)	1.5, 2.0	2.0, 4.5	1.5, 2.5	2.5, 4.5	1.0, 1.5	1.5, 4.5	0.5, 0.0	4.0, 3.5	29	
Water Temp (C)	4.5, 4.0	4.0, 5.0	4.5, 4.5	4.5, 4.5	4.5, 4.5	4.5, 5.0	5.5, 3.5	3.5, 5.5	8	
Dissolved Oxygen (mg/l)	10.4, 12.0	12.0, 12.2	11.0, 12.0	12.0, 12.4	10.8, 12.1	12.1, 12.3	10.9, 12.2	12.2, 12.3	13	
pH	7.1, 7.3	7.3, 7.6	7.1, 7.3	7.3, 7.4	7.6, 7.3	7.3, 7.7	6.9, 7.3	7.3, 7.8	13	
Secchi Disc (cm)	46, 135	135, 1524	41, 117	117, 132	41, 102	107, 130	36, 107	107, 107	5	
River Stage (m)	1.08, 1.08	1.08, 1.06	1.08, 1.08	1.08, 1.06	1.08, 1.06	1.06, 1.06	1.08, 1.08	1.08, 1.06	5	
Weather	Clear, Overcast.	Overcast, Overcast.	Clear, Partly Cloudy.	Partly Cloudy, Overcast.	Clear, Partly Cloudy.	Partly Cloudy, Overcast.	Clear, Partly Cloudy.	Partly Cloudy, Overcast.	2	
No. of Specimens	3	4	4	5	4	2	3	4	29	
No. of Species	2	1	3	1	2	1	3	2	8	
Golden shiner	-	-	-	-	-	-	-	-	1	3.4
Shorthead redhorse	-	-	-	-	-	-	-	-	1	3.4
Rock bass	2	4	-	5	3	-	-	-	13	10.3
Pumpkinseed	-	-	-	-	-	-	-	-	3	44.8
White crappie	-	-	1	-	1	2	-	-	4	13.8
Black crappie	-	-	2	-	-	-	-	-	2	6.9
Shiners	1	-	-	-	-	-	-	-	1	6.9

* Clear to bottom at indicated depth.

Table 6.1-20

Fishes taken by trapnet on 1-3 December 1982 near THINS.

Station	TP-AQP-11A1		TP-AQP-11A2		TP-AQP-11A3		TP-AQP-20		Total
	1-2	2-3	1-2	2-3	1-2	2-3	1-2	2-3	
Date	0912-0918	0913-0914	0922-0924	0927-0928	0917-0918	0917-0918	0952-0957	0953-0958	
Air Temp (C)	6.0, 8.5	8.5, 11.0	5.5, 9.5	8.5, 11.5	6.0, 7.5	7.5, 11.5	5.5, 9.5	7.5, 10.5	
Water Temp (C)	6.0, 7.0	7.0, 7.5	6.0, 7.5	7.5, 8.0	6.5, 7.0	7.0, 7.5	6.0, 7.0	7.0, 8.0	
Dissolved Oxygen (mg/l)	11.7, 10.7	10.3, 10.6	11.6, 11.1	11.1, 11.3	11.3, 11.0	11.0, 11.0	11.4, 11.3	11.3, 11.0	
pH	7.2, 7.5	7.5, 7.9	7.5, 7.3	7.3, 7.9	7.7, 7.5	7.5, 8.0	7.9, 7.1	7.1, 7.3	
Secchi Disc (cm)	33, 81	81, 89	30, 16	36, 38	33, 24	34, 29	25, 28	26, 29	
River Stage (m)	1.29, 1.35	1.35, 1.37	1.29, 1.31	1.35, 1.37	1.29, 1.35	1.35, 1.37	1.29, 1.31	1.35, 1.37	
Weather	Fog	Fog	Heavy Rain, Fog	Fog	Fog	Fog	Fog	Fog	
No. of Specimens	6	2	-	2	2	1	12	1	26
No. of Species	2	2	-	2	2	1	2	1	4
Shorthead redhorse	-	-	NO	-	-	-	-	-	1
Chummy catfish	-	-	-	-	-	-	-	-	1
Rock bass	5	1	FISH	1	-	-	11	1	17
Fumpkinseed	-	1	-	-	-	-	-	-	3
Smallmouth bass	1	1	TAKEN	1	-	-	-	-	3
White crappie	-	-	-	-	-	-	-	-	1

Table 6.1-21

Fishes taken by trapnet on 13-15 December 1982 near THINS.

Station	TP-AQP-11A2		TP-AQP-11A3		TP-AQP-982		Total
	13-14	14-15	13-14	14-15	13-14	14-15	
Date	0925-0929	0902-0915	0930-0918	0927-0929	0931-0941	0951-0958	
Air Temp (C)	-5.0, -3.5	-3.5, -1.5	-5.0, -3.5	-3.5, 0.5	-7.5, -0.5	-7.5, 0.5	
Water Temp (C)	1.5, 0.5	0.5, 0.5	1.5, 0.5	0.5, 1.0	1.0, 0.5	0.5, 1.0	
Dissolved Oxygen (mg/l)	12.5, 11.6	13.4, 14.1	13.0, 13.5	13.5, 14.4	12.8, 13.6	13.6, 14.2	
pH	7.3, 7.8	7.6, 7.7	7.3, 7.7	7.2, 7.6	7.2, 7.2	7.2, 7.2	
Secchi Disc (cm)	185, 94	91, 183	168, 163	163, 152	198, 157	152, 193	
River Stage (m)	1.31, 1.13	1.13, 1.17	1.13, 1.13	1.13, 1.12	1.16, 1.13	1.15, 1.13	
Weather	Partly Cloudy, Clear	Partly Cloudy	Clear	Partly Cloudy	Clear	Partly Cloudy	
No. of Specimens	Partly Cloudy	Partly Cloudy	Partly Cloudy	Clear	Partly Cloudy	Partly Cloudy	
No. of Species	-	-	-	2	1	1	8
Spottail shiner	-	-	-	1	1	1	3
Rock bass	NO	NO	NO	-	NO	-	1
Redbreast sunfish	FISH	FISH	FISH	-	-	-	2
Fumpkinseed	TAKEN	TAKEN	TAKEN	-	-	-	1
White crappie	-	-	-	2	-	-	1
4. Clear to bottom at indicated depth.							5

Table 6.1-22

Summary of fishes taken at trapnet Station TM-AQF-1A3 in 1982.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
American shad	-	-	-	-	-	-	-	1	-	-	1	0.2
Common carp	-	1	3	9	-	1	-	-	-	-	14	2.9
Golden shiner	-	1	-	-	-	-	-	-	-	-	1	0.2
Spottail shiner	7	1	-	-	-	-	-	-	-	-	8	1.6
Quillback	1	-	-	4	1	-	-	-	-	-	6	1.2
White sucker	-	-	-	1	-	1	-	1	-	-	3	0.6
Northern hog sucker	-	-	-	-	-	1	-	-	-	-	1	0.2
Shorthead redhorse	1	-	-	-	-	-	-	-	-	-	1	0.2
White catfish	-	-	-	-	-	-	1	-	-	-	1	0.2
Yellow bullhead	-	-	-	-	-	1	1	-	-	-	2	0.4
Brown bullhead	-	1	2	4	1	-	-	-	-	-	8	1.6
Channel catfish	2	2	1	2	4	3	-	-	3	-	17	3.5
Rock bass	1	6	5	5	4	2	3	1	6	6	39	8.0
Redbreast sunfish	-	2	4	1	1	-	-	4	1	-	13	2.7
Pumpkinseed	1	7	33	61	18	13	33	30	11	1	208	42.9
Bluegill	1	-	-	7	1	3	3	3	13	-	31	6.4
Lepomis hybrid	-	-	-	-	-	-	-	-	1	-	1	0.2
Smallmouth bass	-	-	-	-	-	-	-	-	-	1	1	0.2
White crappie	-	5	2	6	17	6	11	1	4	-	52	10.7
Black crappie	-	8	5	11	12	7	13	11	7	-	74	15.3
Yellow perch	-	-	-	1	-	-	-	-	-	-	1	0.2
Walleye	1	-	-	-	-	-	-	-	1	-	2	0.4
No. of Specimens	15	34	55	112	59	38	65	52	47	8	485	
No. of Species	8	10	8	12	9	10	7	8	8	3	21	
No. of Collections	2	4	4	4	4	4	4	4	4	4	38	
No./Collection	7.50	8.50	13.75	28.00	14.75	9.50	16.25	13.00	11.75	2.00	12.76	
Diversity Index	2.23	2.76	1.96	2.36	2.36	2.64	1.94	1.83	2.62	0.94	2.80	

Table 6.1-23

Summary of fishes taken at trapnet Station TM-AQF-11A2 in 1982.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Gizzard shad	-	-	-	-	-	-	-	-	1	-	1	0.2
Common carp	-	-	-	1	1	-	-	-	-	-	2	0.4
Spottail shiner	9	1	-	-	-	-	-	-	-	-	10	1.8
Fallfish	1	-	-	-	-	-	-	-	-	-	1	0.2
Quillback	-	-	-	-	1	1	-	-	-	-	2	0.4
White sucker	-	2	-	-	-	1	-	-	-	-	3	0.5
Northern hog sucker	2	-	-	-	-	-	-	-	-	-	2	0.4
Shorthead redhorse	3	-	1	-	-	-	1	-	-	-	5	0.9
White catfish	-	-	1	-	-	-	-	-	-	-	1	0.2
Yellow bullhead	-	-	-	-	-	1	-	1	-	-	2	0.4
Brown bullhead	-	-	1	1	-	-	-	-	-	-	2	0.4
Channel catfish	3	23	-	5	2	2	3	-	-	-	38	6.7
Rock bass	-	6	3	6	6	5	5	12	7	1	51	9.0
Redbreast sunfish	-	1	1	4	2	1	10	2	-	-	21	3.7
Pumpkinseed	1	-	89	11	48	27	19	7	8	1	271	48.0
Bluegill	-	-	2	6	8	4	5	-	3	-	28	5.0
Lepomis hybrid	-	-	1	-	-	-	-	-	-	-	1	0.2
Smallmouth bass	-	2	-	-	-	-	-	-	-	-	2	0.4
White crappie	1	-	4	9	13	5	5	7	5	2	51	9.0
Black crappie	-	6	5	6	15	7	13	9	5	-	66	11.7
Walleye	1	2	-	-	-	-	1	-	-	-	4	0.7
No. of Specimens	21	43	108	49	96	54	62	98	29	4	564	
No. of Species	8	8	9	9	9	10	9	6	6	3	20	
No. of Collections	2	4	4	4	4	4	4	4	4	4	38	
No./Collection	10.50	10.75	27.00	12.25	24.00	13.50	15.50	24.50	7.25	1.00	14.84	
Diversity Index	2.32	2.06	1.13	2.82	2.19	2.32	2.64	1.49	2.30	1.25	2.63	

Table 6.1-24

Summary of fishes taken at trapnet Station TM-AQF-11A3 in 1982.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Common carp	-	-	-	1	-	-	1	-	-	-	2	0.4
Spottail shiner	-	4	-	-	-	-	-	-	-	-	4	1.8
Spotfin shiner	-	-	-	2	1	-	1	-	-	-	4	0.9
Quillback	-	-	-	2	1	25	-	-	-	-	28	6.2
White sucker	1	-	-	1	-	1	-	-	-	-	3	0.7
Northern hog sucker	1	-	-	-	-	-	-	-	-	-	1	0.2
Shorthead redhorse	3	-	-	-	-	-	-	-	3	1	7	1.6
White catfish	-	-	2	1	1	1	1	-	-	-	6	1.3
Yellow bullhead	-	-	-	1	-	-	-	-	-	-	1	0.2
Brown bullhead	-	-	-	1	-	-	-	-	-	-	1	0.2
Channel catfish	6	-	3	3	-	4	3	2	17	-	38	8.4
Rock bass	-	8	10	12	7	4	6	16	4	2	69	15.3
Redbreast sunfish	-	-	2	-	-	-	3	4	1	-	10	2.2
Pumpkinseed	-	-	3	5	7	14	45	56	7	-	147	32.7
Bluegill	-	-	1	2	6	2	5	-	1	-	17	3.8
Smallmouth bass	1	-	-	-	-	-	-	-	-	-	1	0.2
Largemouth bass	-	1	-	-	-	-	1	-	-	-	2	0.4
White crappie	-	3	-	7	9	4	3	5	3	1	35	7.8
Black crappie	-	2	5	22	20	4	5	6	4	-	68	15.1
Walleye	1	-	-	-	-	1	-	-	-	-	2	0.4
No. of Specimens	17	18	36	60	52	60	74	89	40	4	450	
No. of Species	7	5	7	13	8	10	11	6	8	3	20	
No. of Collections	2	4	4	4	4	4	4	4	4	4	38	
No./Collection	8.50	4.50	9.00	15.00	13.00	15.00	18.50	22.25	10.00	1.00	11.84	
Diversity Index	2.25	1.91	2.26	2.75	2.37	2.44	2.09	1.66	2.37	1.25	3.04	

Table 6.1-25

Summary of fishes taken at trapnet Station TM-AQF-9B2 in 1982.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Common carp	-	1	1	2	-	1	1	-	-	-	6	0.6
River chub	-	-	-	1	-	-	-	-	-	-	1	0.1
Golden shiner	-	-	-	1	3	2	-	-	1	-	7	0.7
Spottail shiner	-	-	1	-	-	-	-	1	-	1	3	0.3
Fallfish	1	-	-	-	-	-	-	-	-	-	1	0.1
Quillback	1	6	-	-	2	4	-	-	-	-	13	1.3
White sucker	1	-	-	-	-	-	-	-	-	-	1	0.1
Shorthead redhorse	1	-	1	-	-	-	-	-	-	-	2	0.2
White catfish	-	2	-	-	1	-	-	-	-	-	3	0.3
Brown bullhead	-	-	2	8	3	1	-	-	1	-	15	1.5
Channel catfish	-	11	3	-	1	-	2	1	3	12	33	3.2
Rock bass	-	4	4	5	1	6	6	4	3	1	34	3.3
Redbreast sunfish	-	-	2	-	-	-	-	1	2	1	6	0.6
Green sunfish	-	-	1	-	-	-	-	-	-	-	1	0.1
Pumpkinseed	-	2	195	41	55	7	42	48	24	2	416	40.3
Bluegill	-	1	29	4	9	4	31	8	8	-	94	9.1
Lepomis hybrid	-	-	-	-	1	-	-	-	-	-	1	0.1
Smallmouth bass	-	1	-	-	-	-	-	-	-	-	1	0.1
Largemouth bass	-	-	-	-	-	-	-	2	1	-	3	0.3
White crappie	2	-	39	25	48	33	30	28	10	1	216	20.9
Black crappie	1	-	27	29	42	20	25	18	5	-	167	16.2
Yellow perch	-	1	-	1	1	-	-	2	-	-	5	0.5
Walleye	2	-	-	-	-	-	-	-	1	-	3	0.3
No. of Specimens	9	29	305	117	167	78	137	113	59	18	1032	
No. of Species	7	9	12	10	11	9	7	10	11	6	22	
No. of Collections	2	4	4	4	4	4	4	4	4	4	38	
No./Collection	4.50	7.25	76.25	29.25	41.75	19.50	34.25	28.25	14.75	4.50	27.16	
Diversity Index	2.39	2.46	1.76	2.37	2.25	2.31	2.25	2.23	2.57	1.53	2.57	

Table 6.1-26

Monthly summary of fishes taken by trapnet in 1982.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
American shad	-	-	-	-	-	-	-	1	-	-	1	+
Cizzard shad	-	-	-	-	-	-	-	-	1	-	1	+
Common carp	-	2	4	13	1	2	2	-	-	-	24	0.9
River chub	-	-	-	1	-	-	-	-	-	-	1	+
Golden shiner	-	1	-	1	3	2	-	-	1	-	8	0.3
Spottail shiner	20	6	1	-	-	-	-	1	-	1	29	1.1
Spotfin shiner	-	-	-	2	1	-	1	-	-	-	4	0.2
Fallfish	2	-	-	-	-	-	-	-	-	-	2	0.1
Quillback	2	6	-	6	5	30	-	-	-	-	49	1.9
White sucker	2	2	-	2	-	3	-	1	-	-	10	0.4
Northern hog sucker	3	-	-	-	-	1	-	-	-	-	4	0.2
Shorthead redhorse	8	-	2	-	-	-	1	-	3	1	15	0.6
White catfish	-	2	3	1	2	1	2	-	-	-	11	0.4
Yellow bullhead	-	-	-	-	-	2	1	1	-	-	5	0.2
Brown bullhead	-	1	5	14	4	1	-	-	1	-	26	1.0
Channel catfish	11	36	7	10	7	9	8	3	23	12	126	5.0
Rock bass	1	24	22	28	18	17	20	33	20	10	193	7.6
Redbreast sunfish	-	3	9	5	3	1	13	11	4	1	50	2.0
Green sunfish	-	-	1	-	-	-	-	-	-	-	1	+
Pumpkinseed	2	9	330	118	128	61	139	201	50	4	1042	41.2
Bluegill	1	1	32	19	24	13	44	11	23	-	170	6.7
Lepomis hybrid	-	-	1	-	1	-	-	-	1	-	3	0.1
Smallmouth bass	1	3	-	-	-	-	-	-	-	1	5	0.2
Largemouth bass	-	1	-	-	-	-	1	2	1	-	5	0.2
White crappie	3	8	45	47	87	48	49	41	22	4	354	14.0
Black crappie	1	16	42	68	89	38	56	44	21	-	375	14.8
Yellow perch	-	1	-	2	1	-	-	2	-	-	6	0.2
Walleye	5	2	-	-	-	1	1	-	2	-	11	0.4
No. of Specimens	62	124	504	338	374	230	338	352	175	34	2531	
No. of Species	14	18	13	17	14	16	14	13	13	8	27	
No. of Collections	8	16	16	16	16	16	16	16	16	16	152	
No./Collection	7.75	7.75	31.50	21.12	23.38	14.38	21.12	22.00	10.94	2.12	16.65	
Diversity Index	2.98	3.17	1.89	2.84	2.46	2.89	2.49	2.05	2.88	2.27	2.83	

+ Less than 0.05%.

Table 6.1-27

Summary of fishes taken at trapnet stations in 1982.

Station	TM-AOF-1A3	TM-AOF-11A2	TM-AOF-11A3	TM-AOF-9B2	Total	% Catch
American shad	1	-	-	-	1	+
Cizzard shad	-	1	-	-	1	+
Common carp	14	2	2	6	24	0.9
River chub	-	-	-	1	1	+
Golden shiner	1	-	-	7	8	0.3
Spottail shiner	8	10	8	3	29	1.1
Spotfin shiner	-	-	4	-	4	0.2
Fallfish	-	1	-	1	2	0.1
Quillback	6	2	38	13	49	1.9
White sucker	3	3	3	1	10	0.4
Northern hog sucker	1	2	1	-	4	0.2
Shorthead redhorse	1	5	7	2	15	0.6
White catfish	1	1	6	3	11	0.4
Yellow bullhead	2	2	1	-	5	0.2
Brown bullhead	8	2	1	15	26	1.0
Channel catfish	17	38	38	33	126	5.0
Rock bass	39	51	69	34	193	7.6
Redbreast sunfish	13	21	10	6	50	2.0
Green sunfish	-	-	-	1	1	+
Pumpkinseed	208	271	147	416	1042	41.2
Bluegill	31	28	17	94	170	6.7
Lepomis hybrid	1	1	-	1	3	0.1
Smallmouth bass	1	2	1	1	5	0.2
Largemouth bass	-	-	2	3	5	0.2
White crappie	52	51	35	216	354	14.0
Black crappie	74	66	68	167	375	14.8
Yellow perch	1	-	-	5	6	0.2
Walleye	2	4	2	3	11	0.4
No. of Specimens	485	564	450	1032	2531	
No. of Species	21	20	20	22	27	
No. of Collections	38	38	38	38	152	
No./Collection	12.76	14.84	11.84	27.16	16.65	
Diversity Index	1.80	2.63	3.04	2.57	2.83	

+ Less than 0.05%.

Table 6.1-28

Monthly summary of fish biomass (g) at trapnet stations in 1982.

Station	TN-AQF-1A3	TN-AQF-11A2	TN-AQF-11A3	TN-AQF-9B2	Total
Mar	574	1443	2204	1032	5273
Apr	7737	3634	2049	6784	22224
May	72919	6848	5080	16822	41669
Jun	40376	11472	12288	28737	82874
Jul	5274	11024	5364	2231	38175
Aug	9892	5306	27837	10818	53953
Sep	3812	10146	17362	14110	47430
Oct	4878	8824	10800	9678	34180
Nov	5431	3161	24652	6102	39346
Dec	937	382	613	4643	6577
TOTAL	97932	64260	108250	101259	371701

Table 6.1-29

Monthly summary of biomass (g) of fishes taxed by trapnet in 1982.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
American shad	-	-	-	-	-	-	-	8	-	-	8
Gizzard shad	-	-	-	-	-	-	-	-	110	-	110
Common carp	-	5668	8959	44394	2608	4168	7088	-	-	-	73085
River chub	-	-	-	24	-	-	-	-	-	-	24
Golden shiner	-	38	-	72	160	200	-	-	52	-	522
Spottail shiner	175	57	7	-	-	-	-	17	-	11	262
Spotfin shiner	-	-	-	29	7	-	7	-	-	-	43
Fallfish	96	-	-	-	-	-	-	-	-	-	96
Quillback	48	1772	-	5183	4427	26873	-	-	-	-	38303
White sucker	655	1276	-	812	-	1146	-	540	-	-	4379
Northern hog sucker	390	-	-	-	-	250	-	-	-	-	640
Shorthead redhorse	1779	-	255	-	-	-	525	-	991	242	3792
White catfish	-	920	2228	155	452	603	1460	-	-	-	5818
Yellow bullhead	-	-	-	535	-	310	196	248	-	-	1289
Brown bullhead	-	200	2314	5091	1050	415	-	-	312	-	9382
Channel catfish	1232	4961	3216	4310	6302	5629	9724	3130	23573	4113	66410
Rock bass	115	3172	1626	2835	1408	1846	2194	3938	1993	1308	20435
Redbreast sunfish	-	286	792	439	267	120	1200	1116	428	89	4737
Green sunfish	-	-	30	-	-	-	-	-	-	-	30
Pumpkinseed	38	683	13096	8183	7136	4202	9832	13675	3459	343	60637
Bluegill	18	68	2051	1383	1726	1077	3658	969	2443	-	13393
Lepomis hybrid	-	-	30	-	62	-	-	-	74	-	166
Smallmouth bass	82	484	-	-	-	-	-	-	-	115	681
Largemouth bass	-	280	-	-	-	-	171	478	258	-	1187
White crappie	155	857	4128	2962	3286	2493	3117	2991	2260	356	22635
Black crappie	126	1260	2937	6316	9061	4608	8235	6791	3100	-	42434
Yellow perch	-	12	-	151	33	-	-	264	-	-	460
Walleye	354	60	-	-	-	13	23	-	293	-	743
TOTAL	5273	22224	41669	82874	38175	53953	47430	34180	39346	6577	371701

Table 6.1-30

Summary of biomass (g) of fishes taken at trapnet stations in 1982.

Station	TN-AQF-1A3	TN-AQF-11A2	TN-AQF-11A3	TN-AQF-9B2	Total
American shad	8	-	-	-	8
Gizzard shad	-	110	-	-	110
Common carp	40483	8703	7513	16386	73085
River chub	-	-	-	24	24
Golden shiner	38	-	-	484	522
Spottail shiner	71	87	74	30	262
Spotfin shiner	-	-	43	-	43
Fallfish	-	40	-	56	96
Quillback	3779	1853	26802	5869	38303
White sucker	1382	1462	1177	358	4379
Northern hog sucker	250	170	220	-	640
Shorthead redhorse	151	1518	1782	341	3792
White catfish	580	910	3543	1185	5818
Yellow bullhead	376	378	535	-	1289
Brown bullhead	2947	213	300	5922	9382
Channel catfish	14655	11131	34278	6346	66410
Rock bass	3459	5672	7577	3727	20435
Redbreast sunfish	1333	2050	869	485	4737
Green sunfish	-	-	-	30	30
Pumpkinseed	12911	16067	11376	20289	60637
Bluegill	7394	2297	1541	7161	13393
Lepomis hybrid	74	30	-	62	166
Smallmouth bass	115	304	52	180	681
Largemouth bass	-	-	451	736	1187
White crappie	3337	3661	2327	13290	22635
Black crappie	9441	7806	7894	17493	42434
Yellow perch	33	-	-	427	460
Walleye	115	178	72	378	743
TOTAL	97932	64260	108250	101259	371701

Table 6.1-31

Mean, minimum, and maximum percent frequencies of family composition at trapnet stations sampled 1974 through 1981 vs. 1982 frequencies. Freshwater eel family not included due to low numbers.

	TN-AQF-1A1				TN-AQF-11A1				TN-AQF-11A3				TN-AQF-9B2			
	Mean	Min	Max	1982	Mean	Min	Max	1982	Mean	Min	Max	1982	Mean	Min	Max	1982
Herrings	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.2	0.1	0.0	0.8	0.0	0.0	0.0	0.1	0.0
Minnows	8.4	2.8	20.1	4.7	3.0	0.9	11.7	2.4	6.8	2.1	13.3	3.1	3.8	1.5	6.8	1.8
Suckers	3.4	0.6	10.9	2.2	1.9	0.5	4.7	2.2	3.4	2.0	5.8	8.7	4.0	1.5	8.5	4.4
Catfishes	19.9	1.3	46.7	5.7	26.7	4.7	72.3	7.7	17.0	6.2	31.6	10.1	22.7	7.3	59.8	5.0
Sunfishes	66.0	52.9	78.3	86.4	84.8	20.2	90.4	87.0	70.9	59.9	84.4	77.5	67.9	35.6	84.4	91.0
Percies	2.3	0.0	10.3	0.6	1.7	0.0	4.3	0.7	1.5	0.0	3.6	0.6	1.0	0.0	3.2	0.8

Table 6.1-32

Percent similarity indices of species composition between trapnet stations sampled in 1981. Station prefix TN-AQF- deleted.

	1A1	11A2	11A3	9B2
11A2	83.9			
11A3	78.5	79.3		
9B2	84.8	75.7	76.0	

Table 6.1-33

Length frequency, total and mean weights, condition factor (K), and reproductive status (R; J = juvenile, A = adult) per 5 mm fork length interval of pumpkinseed taken by trapnet in 1982.

Station	TN-AQF-1A1					TN-AQF-11A2					TN-AQF-11A3					TN-AQF-9B2				
	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R
76-80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	11	11.0	2.15	J
81-85	1	15	15.0	2.44	J	-	-	-	-	-	-	-	-	-	1	17	17.0	2.77	J	
86-90	3	51	17.0	2.33	J	1	14	14.0	1.92	J	-	-	-	-	1	16	16.0	2.19	J	
91-95	3	36	18.7	2.18	A	1	23	23.0	2.68	A	-	-	-	-	4	82	20.5	2.29	A	
96-100	9	220	24.4	2.44	A	6	135	22.5	2.25	A	1	20	20.0	2.00	A	5	113	22.6	2.26	A
101-105	8	244	30.5	2.36	A	4	109	27.2	2.35	A	2	46	23.0	1.99	A	11	308	28.0	2.42	A
106-110	10	318	31.8	2.37	A	13	410	31.5	2.37	A	-	-	-	-	16	506	31.6	2.37	A	
111-115	9	306	34.0	2.24	A	17	612	36.0	2.37	A	1	38	38.0	2.50	A	24	866	36.1	2.37	A
116-120	21	934	44.5	2.58	A	25	1035	41.4	2.40	A	2	80	40.0	2.31	A	28	1204	43.0	2.49	A
121-125	25	1227	49.1	3.51	A	39	1912	49.0	2.51	A	6	322	53.7	2.75	A	45	2214	49.2	2.52	A
126-130	25	1421	56.8	2.59	A	41	2376	58.0	2.64	A	13	755	58.1	2.64	A	47	2584	54.4	2.61	A
131-135	27	1734	64.0	2.64	A	30	1901	63.4	2.38	A	17	1057	62.2	2.53	A	68	2989	62.3	2.53	A
136-140	17	1196	70.4	2.57	A	30	2122	70.7	2.58	A	26	1843	70.9	2.58	A	29	2087	72.0	2.62	A
141-145	10	795	79.5	2.61	A	21	1594	75.9	2.49	A	25	1850	74.0	2.43	A	22	1667	75.8	2.49	A
146-150	9	750	83.3	2.67	A	10	832	83.2	2.47	A	20	1674	83.7	2.48	A	17	1409	82.9	2.46	A
151-155	9	889	98.8	2.65	A	13	1178	90.6	2.43	A	8	747	93.4	2.51	A	14	1308	93.4	2.51	A
156-160	5	37	107.4	2.62	A	4	377	94.2	2.30	A	9	919	102.1	2.49	A	8	826	103.2	2.50	A
161-165	3	593	197.0	2.65	A	4	423	105.8	2.36	A	7	779	111.3	2.48	A	8	854	106.8	2.38	A
166-170	1	121	121.0	2.48	A	5	617	123.4	2.51	A	5	590	118.0	2.50	A	4	480	120.0	2.44	A
171-175	4	539	134.8	2.52	A	2	357	178.5	2.40	A	4	51	127.5	2.38	A	2	269	134.5	2.51	A
176-180	4	590	147.5	2.53	A	1	140	140.0	2.40	A	1	140	140.0	2.40	A	2	308	154.0	2.64	A
181-185	2	355	177.5	2.80	A	-	-	-	-	-	-	-	-	-	1	171	171.0	2.70	A	

Table 6.1-34

Length frequency, total and mean weights, condition factor (K), and reproductive status (R; Y = young, J = juvenile, A = adult) per 5 mm fork length interval of white crappie taken by trapnet in 1982.

Station Fork Length (5 mm intervals)	TM-AQF-1A3					TM-AQF-11A2					TM-AQF-11A3					TM-AQF-9B2				
	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R
51-55	2	6	3.0	1.80	Y	-	-	-	-	-	-	-	-	-	-	1	4	4.0	1.85	Y
56-60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	5.0	1.82	Y
61-65	1	5	5.0	1.82	Y	-	-	-	-	-	-	-	-	-	1	6	6.0	1.75	Y	
66-70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81-85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7	7.0	1.14	Y	
86-90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	30	10.0	1.37	Y	
96-100	-	-	-	-	-	-	-	-	-	-	1	1	11.0	1.10	J	2	24	12.0	1.20	J
101-105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	15	15.0	1.30	J	
106-110	-	-	-	-	-	2	36	18.0	1.35	J	1	10	10.0	0.75	J	2	40	20.0	1.50	J
111-115	-	-	-	-	-	-	-	-	-	-	1	22	22.0	1.45	J	8	156	19.5	1.28	J
116-120	3	58	19.3	1.12	J	3	67	22.3	1.29	J	-	-	-	-	11	245	22.3	1.29	J	
121-125	9	227	25.2	1.29	A	2	49	24.5	1.25	A	1	28	28.0	1.43	A	13	308	23.7	1.21	A
126-130	-	-	-	-	-	1	31	31.0	1.41	A	1	27	27.0	1.23	A	13	365	28.1	1.28	A
131-135	1	40	40.0	1.63	A	-	-	-	-	-	3	109	36.3	1.48	A	10	335	33.5	1.36	A
136-140	1	40	40.0	1.46	A	2	73	36.5	1.33	A	1	37	37.0	1.35	A	14	507	36.2	1.32	A
141-145	1	33	33.0	1.08	A	5	204	40.8	1.34	A	1	40	40.0	1.31	A	11	451	41.0	1.34	A
146-150	2	91	45.5	1.35	A	1	47	47.0	1.39	A	1	45	45.0	1.33	A	4	188	47.0	1.39	A
151-155	2	100	50.0	1.34	A	3	144	48.0	1.29	A	-	-	-	-	10	486	48.6	1.31	A	
156-160	3	174	58.0	1.42	A	3	170	56.7	1.38	A	3	176	58.7	1.43	A	12	648	54.0	1.32	A
161-165	3	187	62.3	1.39	A	1	65	65.0	1.45	A	3	196	65.3	1.45	A	5	295	59.0	1.31	A
166-170	2	145	72.5	1.48	A	-	-	-	-	-	-	-	-	-	20	1291	64.6	1.31	A	
171-175	5	346	69.2	1.29	A	5	378	75.6	1.41	A	1	65	65.0	1.21	A	9	627	69.7	1.30	A
176-180	5	381	76.2	1.31	A	4	291	72.8	1.25	A	5	394	78.8	1.35	A	10	779	77.9	1.34	A
181-185	-	-	-	-	-	1	87	87.0	1.37	A	4	342	85.5	1.35	A	11	955	86.8	1.37	A
186-190	1	94	94.0	1.37	A	5	518	103.6	1.51	A	4	388	97.0	1.41	A	8	766	95.8	1.40	A
191-195	1	82	82.0	1.11	A	-	-	-	-	-	2	205	102.5	1.38	A	7	722	103.1	1.39	A
196-200	3	319	106.3	1.33	A	3	346	115.3	1.44	A	-	-	-	-	10	1083	108.3	1.35	A	
201-205	2	233	116.5	1.35	A	3	334	111.3	1.29	A	2	232	116.0	1.35	A	2	241	120.5	1.40	A
206-210	2	272	136.0	1.47	A	2	257	128.5	1.39	A	-	-	-	-	5	660	128.0	1.38	A	
211-215	2	304	152.0	1.53	A	2	278	139.0	1.40	A	-	-	-	-	2	273	136.5	1.37	A	
216-220	-	-	-	-	-	1	146	146.0	1.37	A	-	-	-	-	-	-	-	-	-	-
221-225	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	478	159.3	1.40	A	
226-230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	173	173.0	1.42	A	
231-235	-	-	-	-	-	1	160	160.0	1.23	A	-	-	-	-	1	196	196.0	1.51	A	
236-240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	193	193.0	1.40	A	
241-245	1	200	200.0	1.36	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
246-250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	198	198.0	1.27	A	
261-265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
271-275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	250	250.0	1.34	A	
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	310	310.0	1.49	A	

Table 6.1-35

Length frequency, total and mean weights, condition factor (K), and reproductive status (R; Y = young, J = juvenile, A = adult) per 5 mm fork length interval of black crappie taken by trapnet in 1982.

Station Fork Length (5 mm intervals)	TM-AQF-1A3					TM-AQF-11A2					TM-AQF-11A3					TM-AQF-9B2				
	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R	No.	Total wt. (g)	Mean wt. (g)	K	R
61-65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	4.0	1.46	Y
81-85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10	10.0	1.63	Y
86-90	-	-	-	-	-	2	23	11.5	1.58	J	-	-	-	-	-	-	-	-	-	-
91-95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	12	12.0	1.40	J
96-100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	14	14.0	1.40	J
101-105	1	16	16.0	1.38	J	-	-	-	-	-	-	-	-	-	-	1	15	15.0	1.30	J
106-110	1	22	22.0	1.65	J	-	-	-	-	-	-	-	-	-	-	1	16	16.0	1.20	J
111-115	2	50	25.0	1.64	J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116-120	1	31	31.0	1.79	J	-	-	-	-	-	-	-	-	-	-	3	86	28.7	1.66	J
126-130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	65	32.5	1.48	A
131-135	1	46	46.0	1.87	A	1	35	35.0	1.42	A	-	-	-	-	-	1	36	36.0	1.46	A
136-140	-	-	-	-	-	1	38	38.0	1.38	A	-	-	-	-	-	1	43	43.0	1.57	A
141-145	1	48	48.0	1.57	A	-	-	-	-	-	-	-	-	-	-	2	79	39.5	1.30	A
146-150	1	58	58.0	1.72	A	3	154	51.3	1.52	A	1	48	48.0	1.42	A	2	97	48.5	1.44	A
151-155	1	60	60.0	1.61	A	2	123	61.5	1.65	A	-	-	-	-	-	7	422	60.3	1.62	A
156-160	5	354	70.8	1.73	A	-	62	62.0	1.51	A	2	129	64.5	1.57	A	6	373	62.2	1.52	A
161-165	3	240	80.0	1.78	A	-	154	77.0	1.71	A	3	234	78.0	1.74	A	12	897	74.8	1.67	A
166-170	5	392	78.4	1.60	A	-	92	92.0	1.87	A	9	733	81.4	1.66	A	13	1095	84.2	1.71	A
171-175	4	357	89.2	1.66	A	6	525	87.5	1.63	A	7	645	92.1	1.72	A	29	1940	92.0	1.72	A
176-180	5	491	98.2	1.68	A	5	500	100.0	1.71	A	8	776	97.0	1.66	A	9	877	99.7	1.71	A
181-185	4	422	105.5	1.67	A	5	533	106.6	1.68	A	12	1290	107.5	1.70	A	15	1666	111.1	1.75	A
186-190	4	571	142.8	2.08	A	4	466	116.5	1.70	A	9	1085	120.6	1.76	A	12	340	111.7	1.63	A
191-195	6	757	126.2	1.70	A	7	888	126.9	1.71	A	-	-	-	-	-	1	2431	127.9	1.72	A
196-200	2	259	129.5	1.62	A	4	568	142.0	1.78	A	3	408	136.0	1.70	A	8	1117	137.1	1.71	A
201-205	6	938	156.3	1.81	A	11	1634	148.5	1.72	A	7	1049	149.9	1.74	A	8	1141	142.6	1.66	A
206-210	4	635	158.8	1.71	A	4	633	158.2	1.71	A	2	322	161.0	1.74	A	7	1099	157.0	1.70	A
211-215	5	861	172.2	1.73	A	2	318	159.0	1.60	A	2	353	176.5	1.78	A	5	856	171.2	1.72	A
216-220	4	738	184.5	1.73	A	-	-	-	-	-	1	175	175.0	1.64	A	3	571	190.3	1.79	A
221-225	2	386	193.0	1.69	A	1	176	176.0	1.55	A	1	174	174.0	1.53	A	7	373	186.5	1.64	A
226-230	2	424	212.0	1.74	A	1	212	212.0	1.74	A	-	-	-	-	-	2	412	206.0	1.69	A
231-235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	228	228.0	1.76	A
236-240	1	223	223.0	1.61	A	3	672	224.0	1.62	A	-	-	-	-	-	-	-	-	-	-
251-255	-	-	-	-	-	-	-	-	-	-	1	273	273.0	1.65	A	-	-	-	-	-
256-260	1	320	320.0	1.82	A	-	-	-	-	-	-	-	-	-	-	1	278	278.0	1.58	A
266-270	1	354	354.0	1.80	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
271-275	1	388	388.0	1.87	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

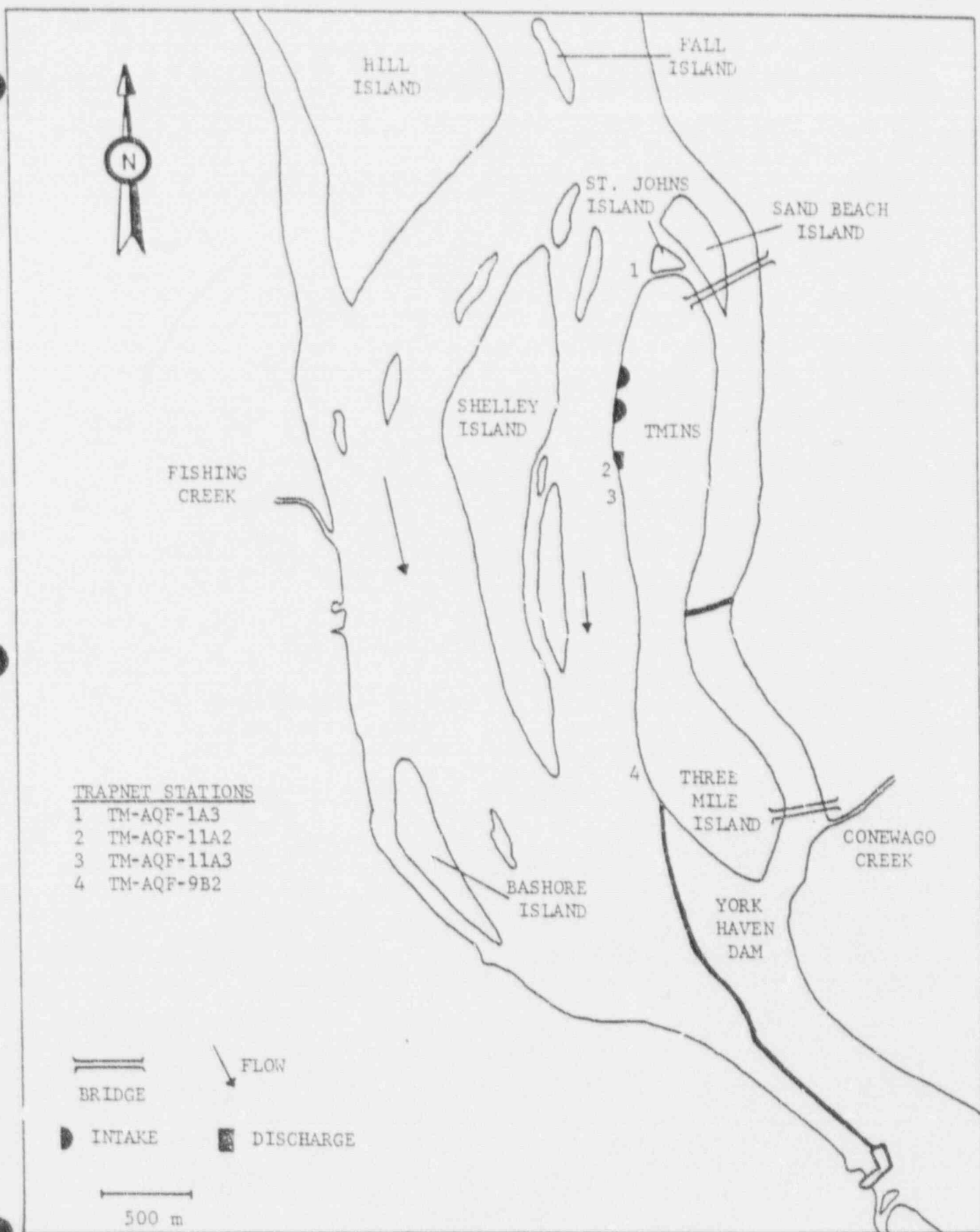


Figure 6.1-1. Location of trapnet stations sampled in York Haven Pond.

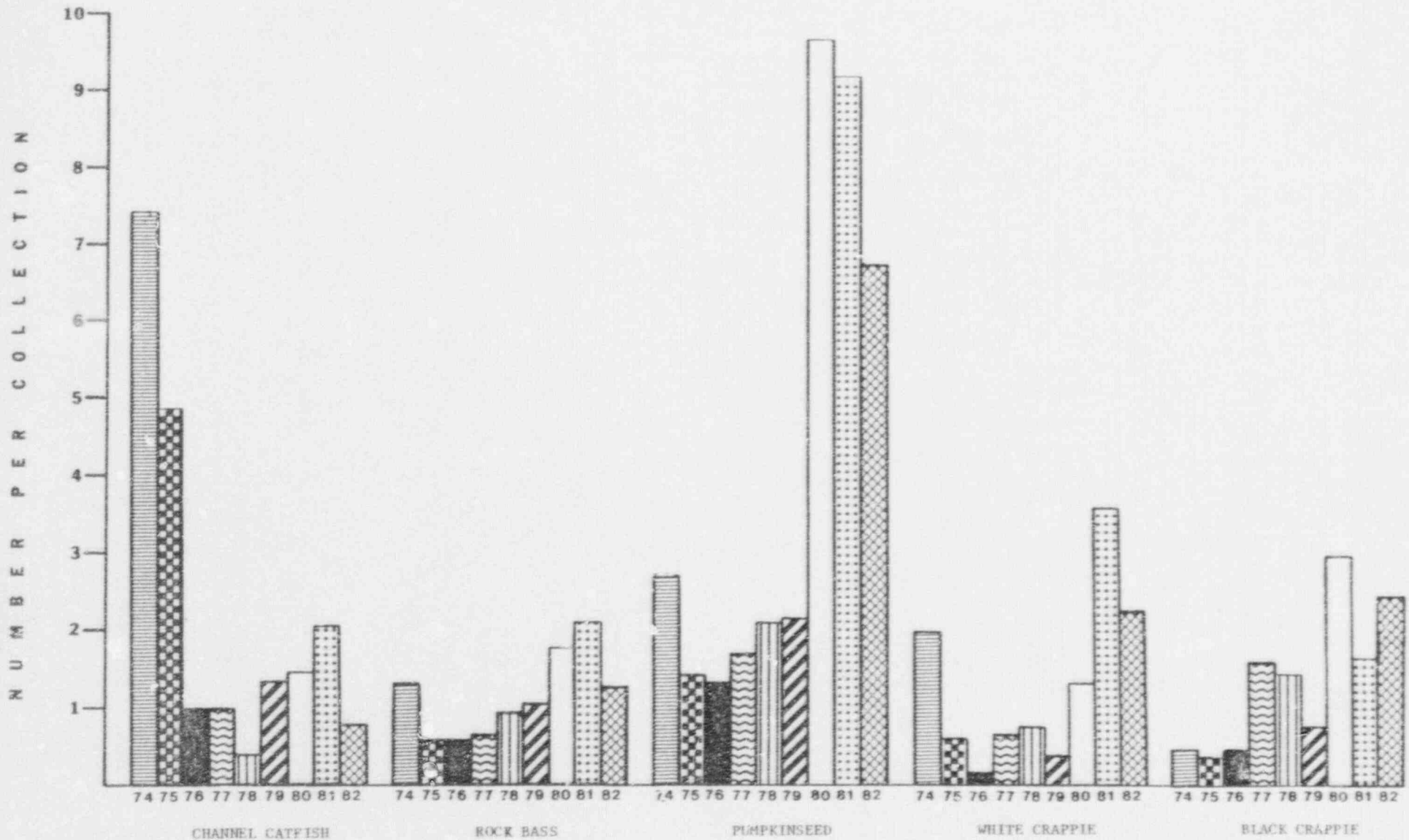


Figure 6.1-2. Yearly catches (number per collection) of channel catfish, rock bass, pumpkinseed, white crappie, and black crappie taken by trapnet near TMINS, 1974 through 1982.

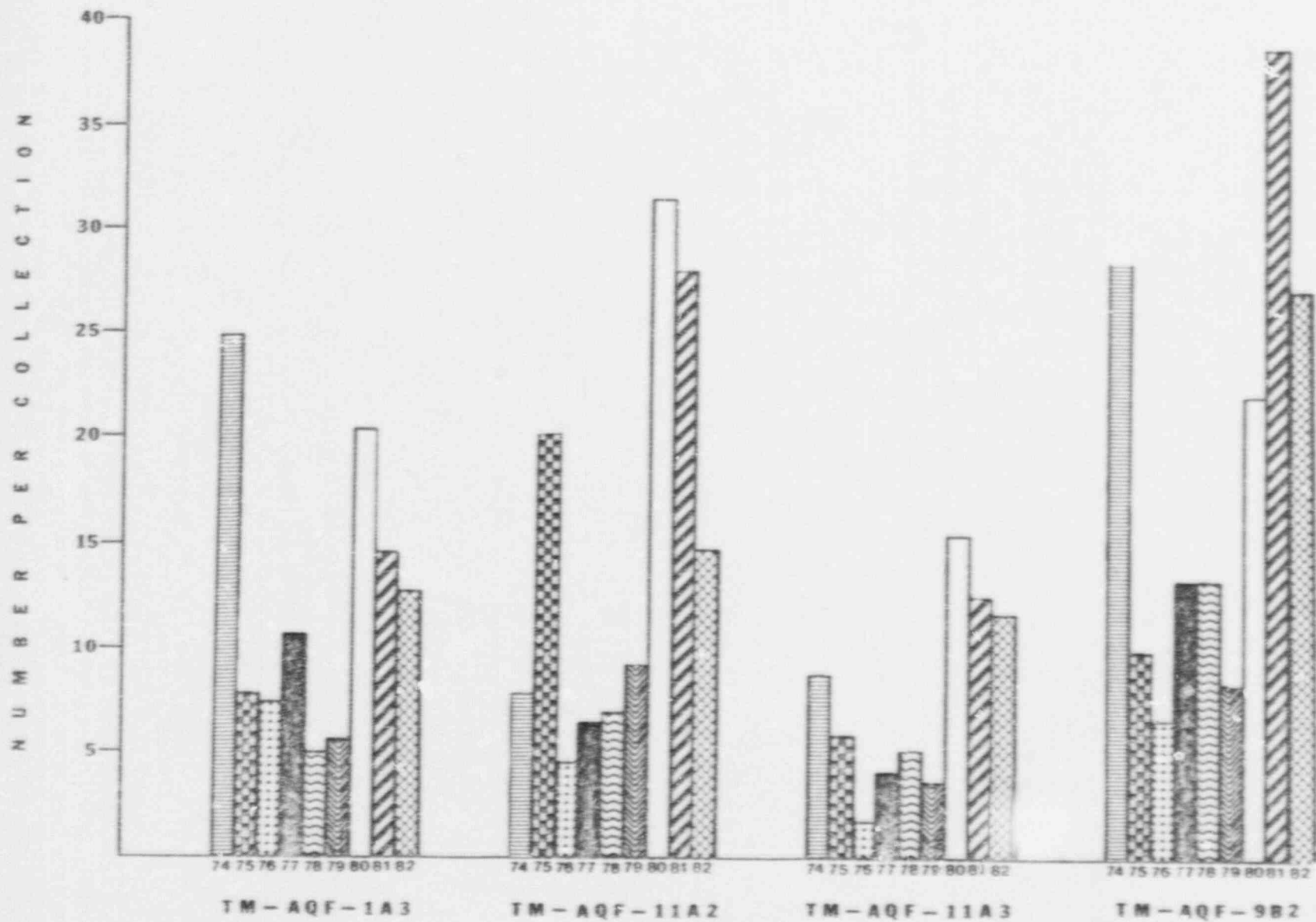


Figure 6.1-3. Yearly total catch (number per collection) at trapnet stations near TONG, 1974 through 1982.

Table 2-1

Location and description of seine stations sampled in 1981.

Station Number	Location and Description
TM-AQF-13B5*	Boat launch along northwest shore of York Haven Pond just downstream from southernmost Pennsylvania Fish Commission boat ramp. Bottom consisted of mud interspersed with a few large boulders. A small backwater sometimes receiving runoff was also seined. About 20 m of shoreline was sampled; depth averaged 0.7 m.
TM-AQF-10B5	Southwest shore of York Haven Pond just upstream from York Haven Generating Station race. The station extended from a mud bottomed beach interspersed with debris and rubble to a bedrock enclosed backwater about 100 m downstream. Water willow (<i>Justicia americana</i>) and wildcelery (<i>Vallisneria spiralis</i>) were common. The beach averaged 0.7 m in depth and the backwater 1.0 m.
TM-AQF-16A5	Northwest shore of Henry Island. The station extended a total of about 50 m along Henry Island and an offshore gravel bar. The substrate was composed of mud, clay, sand, and coal dirt up to 0.5 m in depth. Water depth averaged 0.9 m. The gravel bar became exposed as river stage neared 1.5 m.
TM-AQF-1A2	Northwest shore of St. Johns Island. Area sampled included a backwater, shoreline, and gravel bars. Mud, sand, coal dirt, and rubble were common substrates. The shoreline and gravel bars supported water willow. Curly pond weed (<i>Potamogeton crispus</i>) was present in small amounts. River snails (<i>Goniobasis virginica</i>) were abundant on water willow. A total of about 50 m of shoreline was sampled and averaged 0.6 m in depth.
TM-AQF-16A1	West shore of TMI near Gate 19 about 500 m upstream from Discharge. The station extended from a rubble and boulder shoreline to a mud bottomed run about 25 m downstream. Coal dirt and gravel were also common along the shoreline which supported water willow. Average depth was 0.8 m.
TM-AQF-10A2	West shore of TMI, 150 m downstream from Discharge. The station extended about 75 m along a gravel beach that averaged 0.7 m in depth. Gravel, mud, and coal dirt were common substrates. Water willow covered the shoreline and was often partially submerged.
TM-AQF-9B6	West shore of TMI, 1100 m downstream from Discharge. A beach about 20 m in length was sampled. The bottom was composed of mud and average depth was 0.4 m. A fallen tree provided cover and created a small backwater.
TM-AQF-9A1	West shore of TMI, 1500 m downstream from Discharge. About 20 m of shoreline was sampled; depth averaged 0.7 m. A rocky shoreline and shallow backwater were sampled. Boulders and rubble were common along the shoreline; the backwater substrate was soft mud.
TM-AQF-9B3	West shore of TMI, 2000 m downstream from Discharge. Most sampling was done along a gravel beach and a boat ramp. Offshore, the bottom changed to mud. About 20 m of shoreline was sampled; average depth was 0.7 m. Large trees lined the shoreline upstream from the boat ramp and were sometimes partially submerged. The York Haven Dam marked the downstream end of the station and created a backwater.
TM-AQF-4A2	East shore of east channel at public boat launch. Main substrate was mud, but rubble and some boulders were also common. About 25 m of shoreline was sampled; the bottom dropped abruptly to a depth of about 0.9 m. The beach was supported by submerged railroad ties.

* Prefix TM-AQF- deleted from station numbers for discussion in text.

Table 6.2-2

Fishies taken by seine on 6 January 1982 near TW185.

Station	TP-AQP-1205	TP-AQP-1085	TP-AQP-1643	TP-AQP-1641	TP-AQP-1042	TP-AQP-906	TP-AQP-901	TP-AQP-903	TP-AQP-842	Total	Catch
Time	1157	0859	1163	1037	1020	1002	0965	0926	1107		
Air Temp (C)	-0.5	-1.0	-0.5	-0.5	-0.5	-0.5	-1.0	-1.0	-0.5		-0.5
Water Temp (C)	1.0	1.5	1.0	1.5	1.5	1.5	1.5	1.5	1.5		1.5
Dissolved Oxygen (mg/l)	12.8	12.8	13.6	13.4	13.6	13.4	13.4	13.2	13.2		12.8
pH	8.0	8.2	8.2	8.3	8.3	8.3	8.3	8.3	8.2		8.2
Secchi Disc (cm)	30	25	25	25	25	23	23	25	30		30
River Stage (m)	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93	1.93		1.93
Weather	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast		Overcast
No. of Specimens	3700	5	-	16	7	6	11	6	8		3603
No. of Species	7	1	-	5	4	4	2	3	5		11
No. of Bait	2	4	5	4	4	4	4	4	3		37
Comely minnow	-	-	-	-	-	-	-	-	-		-
Spottail shiner	37	-	-	2	1	1	-	1	2		42
Suniletail shiner	13	-	80	1	-	-	-	-	-		94
Spottail shiner	1301	5	-	37	1	2	10	6	-		1360
Minic shiner	303	-	-	1	-	2	-	-	-		306
Bluntnose minnow	25	-	FISH	-	-	-	-	-	2		27
channel catfish	-	-	-	-	1	-	-	-	-		1
Pumpkinseed	-	-	-	-	-	1	-	-	2		3
Bluegill	-	-	TAKEN	-	-	-	1	-	1		2
white crappie	-	-	-	-	-	-	-	-	-		-
Tessellated darter	-	-	-	-	-	-	-	-	1		1
Unidentified darter	1	-	-	5	4	-	-	-	-		10

* i.e., than 0.05%.

Table 6.2-3

Fishies taken by seine on 10 March 1982 near TW185.

Station	TP-AQP-1205	TP-AQP-1085	TP-AQP-1645	TP-AQP-1641	TP-AQP-1042	TP-AQP-906	TP-AQP-901	TP-AQP-903	TP-AQP-842	Total	Catch
Time	1144	0859	1128	1032	1016	0958	0962	0924	1102		
Air Temp (C)	0.5	0.0	0.0	-0.5	-0.5	0.0	-0.5	-0.5	0.5		0.5
Water Temp (C)	1.0	1.5	1.0	1.0	1.0	1.0	1.0	1.0	2.0		2.0
Dissolved Oxygen (mg/l)	10.7	11.0	11.8	11.1	11.3	11.2	11.2	11.2	11.7		11.7
pH	8.2	8.4	8.2	8.2	8.3	8.2	8.2	8.3	8.2		8.2
Secchi Disc (cm)	97*	81*	107*	61	58	61	66	51	18		18
River Stage (m)	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33		1.33
Weather	Overcast	Partly Cloudy	Overcast	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy		Partly Cloudy
No. of Specimens	39	64	2	51	41	20	13	15	233		531
No. of Species	1	1	1	2	3	3	3	6	5		7
No. of Bait	4	6	6	4	4	4	4	4	4		46
Spottail shiner	-	-	-	-	-	-	-	-	-		-
Suniletail shiner	-	-	-	-	1	-	-	-	1		2
Spottail shiner	34	64	2	68	86	18	10	6	227		537
Bluntnose minnow	-	-	-	3	-	1	2	1	1		6
Bluntnose minnow	-	-	-	-	4	1	-	1	3		9
Bluegill	-	-	-	-	-	-	-	-	-		1
Tessellated darter	-	-	-	-	-	-	-	-	-		1
Unidentified darter	-	-	-	-	-	-	-	-	-		4

* Clear to bottom at indicated depth.

Table 6.2-4

Fishes taken by seine on 26 March 1982 near TMINS.

Station	TM-AQF-13B5	TM-AQF-10B5	TM-AQF-16A5	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9B6	TM-AQF-9A1	TM-AQF-9B3	TM-AQF-6A2	Total	% Catch
Time	0857	0931	1148	1140	1105	1054	1038	1017	0958	1127		
Air Temp (C)	6.0	5.0	4.0	4.0	4.0	5.0	5.0	5.0	5.0	3.0		
Water Temp (C)	7.0	6.5	5.5	5.5	5.0	5.5	5.5	5.5	5.0	6.0		
Dissolved Oxygen (mg/l)	11.4	11.4	11.7	11.8	11.9	12.0	12.0	12.0	12.0	11.4		
pH	8.6	8.5	NA	NA	NA	NA	NA	8.5	8.5	NA		
Secchi Disc (cm)	46	51	36	28	28	25	28	28	25	30		
River Stage (m)	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61	2.61		
Weather	Overcast	Partly Cloudy	Partly Cloudy	Partly Cloudy	Overcast	Overcast	Partly Cloudy	Overcast	Partly Cloudy	Overcast		
No. of Specimens	2143	1058	3	1	9	4	5	78	12	2424	5237	
No. of Species	5	4	1	1	2	2	2	6	4	7	10	
No. of Bauls	3	3	2	2	4	4	4	4	4	1	31	
Comely shiner	2	3	-	-	-	-	-	5	-	35	51	0.9
Spottail shiner	-	-	-	1	-	-	1	-	2	-	4	0.1
Swallowtail shiner	4	-	-	-	-	-	-	1	-	60	65	1.1
Rosyface shiner	-	-	-	-	-	1	-	2	-	-	3	0.1
Spotfin shiner	1563	1052	3	-	7	-	-	62	3	2006	4696	81.9
Mimic shiner	565	-	-	-	-	3	4	7	3	260	862	16.7
Bluntnose minnow	3	2	-	-	-	-	-	1	4	60	70	1.2
White sucker	-	-	-	-	-	-	-	-	-	1	1	+
Pumpkinseed	-	1	-	-	-	-	-	-	-	2	3	0.1
Teasellated darter	-	-	-	-	2	-	-	-	-	-	2	+

NA Not Available.

+ Less than 0.05%.

4-
P-3
2-3

Table 6.2-5

Fishes taken by seine on 12 April 1982 near TMINS.

Station	TM-AQF-13B5	TM-AQF-10B5	TM-AQF-16A5	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9B6	TM-AQF-9A1	TM-AQF-9B3	TM-AQF-6A2	Total	% Catch
Time	1245	1536	1309	1328	1407	1427	1445	1458	1515	1346		
Air Temp (C)	11.0	11.0	10.0	10.0	10.0	11.0	11.0	11.0	11.0	10.0		
Water Temp (C)	8.0	9.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.5		
Dissolved Oxygen (mg/l)	11.4	11.4	11.6	11.6	11.4	11.7	11.4	11.7	11.4	11.3		
pH	8.4	8.1	8.4	8.2	8.1	8.1	8.2	8.2	8.2	8.1		
Secchi Disc (cm)	69	91	71	36	46	46	56	38	51	38		
River Stage (m)	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92		
Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear		
No. of Specimens	2761	445	5	6	18	13	-	1	4	659	3912	
No. of Species	6	6	1	1	3	3	-	1	2	7	10	
No. of Bauls	3	4	4	5	4	4	4	4	4	3	39	
Golden shiner	-	1	-	-	-	-	NO	-	-	-	1	+
Comely shiner	2	12	-	-	-	-	-	-	-	7	21	0.5
Spottail shiner	-	2	-	-	1	11	-	-	-	3	17	0.4
Swallowtail shiner	9	-	-	-	-	-	-	-	-	36	45	1.2
Rosyface shiner	-	-	-	-	-	-	FISH	-	-	2	2	0.1
Spotfin shiner	2570	422	5	6	15	-	-	1	1	552	3572	91.3
Mimic shiner	141	6	-	-	-	1	-	-	-	41	189	4.8
Bluntnose minnow	38	2	-	-	-	-	-	-	-	16	58	1.5
Channel catfish	1	-	-	-	-	-	TAKEN	-	-	-	1	+
Teasellated darter	-	-	-	-	2	1	-	-	3	-	6	0.2

+ Less than 0.05%.

Table 6.2-6

Fishes taken by seine on 21 April 1982 near USDO.

Station	21-APR-1385	21-APR-1385	21-APR-1465	21-APR-142	21-APR-1661	21-APR-10A2	21-APR-986	21-APR-9A1	21-APR-983	21-APR-982	Total	% Catch
Time	1530	1224	1517	1455	1419	1350	1330	1307	1246	1532		
Air Temp (C)	14.0	13.0	13.5	13.5	13.5	13.5	13.5	13.0	12.0	14.0		
Water Temp (C)	14.0	14.0	13.5	13.5	13.5	13.5	13.5	13.5	13.5	14.0		
Dissolved Oxygen (mg/l)	10.0	10.0	9.6	9.8	9.6	10.1	9.8	9.6	9.6	9.6		
pH	8.1	8.3	8.0	8.0	8.4	8.0	8.1	8.1	8.1	8.1		
Secchi Disc (cm)	64	89 ^a	8	8	10	10	10	8	8	15		
River Stage (m)	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06		
Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear		
No. of Specimens	1091	163	40	11	27	10	22	44	100	263	1774	
No. of Species	7	5	10	4	8	7	5	10	8	8	39	
No. of Hauls	3	4	4	4	4	5	4	4	4	3		
River chub	-	-	-	-	1	-	-	-	-	-	1	0.1
Golden shiner	-	-	-	-	-	-	-	-	-	1	1	0.1
Comely shiner	1	-	-	-	-	-	-	-	-	-	1	0.1
Spottail shiner	15	2	9	2	3	-	3	9	2	12	57	3.2
Swallowtail shiner	22	1	1	1	1	1	1	1	1	23	52	2.9
Roadside shiner	-	-	1	1	-	-	-	-	-	-	2	0.1
Spotfin shiner	813	156	21	7	15	1	6	14	86	162	1287	72.3
Mimic shiner	208	-	1	-	1	2	9	7	5	11	244	13.8
Bluntnose minnow	28	4	3	1	-	-	-	-	-	-	36	2.0
White sucker	-	-	-	-	-	1	-	-	-	-	1	0.1
Shorthead redhorse	-	-	-	-	2	-	-	-	-	-	2	0.1
Rock bass	-	-	1	-	-	-	-	-	-	-	1	0.1
Kesbreast sunfish	-	-	1	-	1	1	-	-	-	-	3	0.2
Pumpkinseed	4	-	-	-	-	-	-	2	2	8	12	0.7
Smallmouth bass	-	-	1	-	3	1	-	2	-	-	7	0.4
White crappie	-	-	-	-	-	-	-	1	-	-	1	0.1
Tessellated darter	-	-	-	-	-	3	-	2	-	1	7	0.4
Yellow perch	-	-	-	-	-	-	-	-	1	-	1	0.1

^a Clear to bottom at indicated depth.

Table 6.2-7

Fishes taken by seine on 3 May 1982 near THIN.

Station	21-APR-1385	21-APR-1085	21-APR-1665	21-APR-142	21-APR-1661	21-APR-10A2	21-APR-986	21-APR-9A1	21-APR-983	21-APR-982	Total	% Catch
Time	1223	1539	1250	1316	1409	1427	1447	1502	1520	1343		
Air Temp (C)	23.0	20.0	20.0	20.0	21.0	21.0	21.0	20.0	20.0	22.0		
Water Temp (C)	17.0	18.0	16.5	16.5	17.0	17.0	17.0	17.0	17.0	16.5		
Dissolved Oxygen (mg/l)	9.8	12.6	11.9	10.4	11.0	10.8	10.8	10.9	11.3	10.2		
pH	8.3	8.7	8.9	8.1	8.0	8.0	8.0	7.9	7.9	8.0		
Secchi Disc (cm)	86	107	96	97	76	69	69	76	77	102		
River Stage (m)	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39		
Weather	Clear	Cloudy	Clear	Clear	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy		
No. of Specimens	1050	1066	183	104	106	162	15	181	301	869	4877	
No. of Species	11	5	8	6	3	5	2	7	5	9	16	
No. of Hauls	2	3	6	6	4	4	4	4	4	4		
Golden shiner	1	-	-	-	-	-	-	-	-	2	16	0.3
Comely shiner	5	4	-	1	-	-	-	-	-	-	1	0.1
Common shiner	1	-	-	-	-	-	-	-	-	-	1	0.1
Spottail shiner	50	-	1	2	-	31	4	3	1	2	76	1.5
Swallowtail shiner	6	7	13	-	-	-	-	-	3	105	124	2.5
Roadside shiner	7	-	1	2	-	-	-	-	-	-	10	0.2
Spotfin shiner	876	129	81	132	100	110	11	159	289	671	4171	85.5
Mimic shiner	100	44	70	3	5	15	-	9	8	33	296	6.1
Bluntnose minnow	22	25	11	5	1	5	-	5	-	100	175	3.6
Furhead minnow	-	-	-	-	-	-	-	-	-	1	1	0.1
White sucker	-	-	-	-	-	-	-	1	-	1	2	0.1
Banded killifish	1	-	-	-	-	-	-	-	-	-	1	0.1
Pumpkinseed	-	-	-	-	-	1	-	-	-	-	1	0.1
Smallmouth bass	-	-	-	-	-	-	-	-	1	6	9	0.2
Tessellated darter	-	-	1	-	-	-	-	-	-	-	1	0.1
Banded darter	-	-	-	-	-	-	-	-	-	-	1	0.1

^a Less than 0.05%.

Table 6.2-8

Fishes taken by seine on 17 May 1982 near INDS.

Station	IN-AQF-1385	IN-AQF-1385	IN-AQF-1645	IN-AQF-1A2	IN-AQF-16A1	IN-AQF-1712	IN-AQF-986	IN-AQF-9A1	IN-AQF-9B3	IN-AQF-5A2	Total	% Catch
Time	1550	1223	1525	1455	1410	1348	1328	1310	1250	1434		
Air Temp (C)	22.0	28.0	25.0	27.0	25.0	26.0	26.5	26.0	25.0	24.0		
Water Temp (C)	23.5	26.0	24.5	23.5	23.5	23.5	23.0	23.5	22.5	24.0		
Dissolved Oxygen (mg/l)	13.3	15.9	10.9	10.2	9.7	9.4	9.7	10.1	9.6	17.0		
pH	8.9	9.3	9.1	8.1	8.1	7.9	8.1	8.1	8.2	9.2		
Secchi Disc (cm)	54	56	86	71	97	89	91	89	86	81		
River Stage (m)	1.27	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23		
Weather	Partly Cloudy	Clear	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Clear	Clear	Clear	Partly Cloudy		
No. of Specimens	752	1440	238	909	71	1313	19	27	403	140	5340	
No. of Species	5	8	4	7	2	6	2	2	5	4	16	
No. of Hauls	3	5	5	4	4	4	4	4	4	4	43	
Central stoneroller	-	1	-	-	-	-	-	-	-	-	1	+
Golden shiner	-	1	-	-	-	-	-	-	-	-	1	+
Comely shiner	-	-	-	17	-	4	-	-	16	-	37	0.7
Spottail shiner	1	8	-	1	-	-	-	-	10	1	21	0.4
Swallowtail shiner	22	-	3	-	-	6	-	-	1	-	32	0.6
Rosyface shiner	-	-	-	-	-	-	-	-	1	-	1	+
Spotfin shiner	440	1424	230	879	69	1225	18	26	375	10	4698	87.6
Mimic shiner	233	14	3	9	-	63	-	-	-	-	322	6.0
Bluntnose minnow	56	7	2	1	-	8	1	-	-	153	226	4.2
Fallfish	-	-	-	1	-	-	-	-	-	-	1	+
White sucker	-	2	-	-	2	5	-	-	-	-	13	0.2
Pumpkinseed	-	-	-	1	-	-	-	-	-	4	5	0.1
Bluegill	-	1	-	-	-	-	-	-	-	-	1	+
Tessellated darter	-	-	-	-	-	-	-	1	-	-	1	+

+ Less than 0.05%.

Table 6.2-9

Fishes taken by seine on 1 June 1982 near INDS.

Station	IN-AQF-1385	IN-AQF-1385	IN-AQF-1645	IN-AQF-1A2	IN-AQF-16A1	IN-AQF-10A2	IN-AQF-986	IN-AQF-9A1	IN-AQF-9B3	IN-AQF-5A2	Total	% Catch
Time	1218	1540	1248	1312	1402	1423	1445	1503	1520	1332		
Air Temp (C)	21.0	23.0	21.5	21.0	22.0	22.0	23.0	23.0	23.0	22.0		
Water Temp (C)	21.5	23.5	23.0	23.0	23.0	23.0	23.5	24.0	23.5	23.0		
Dissolved Oxygen (mg/l)	7.0	7.2	8.6	8.8	8.4	8.6	9.0	9.2	8.8	8.2		
pH	8.1	7.8	8.0	7.9	7.9	7.9	7.9	8.0	8.0	7.7		
Secchi Disc (cm)	36	38	74	58	38	36	46	58	64	36		
River Stage (m)	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46	1.46		
Weather	Fog	Fog	Fog	Fog	Fog	Fog	Fog	Fog	Fog	Fog		
No. of Specimens	802	1052	306	248	445	127	110	93	587	350	4120	
No. of Species	12	10	13	11	9	14	7	9	7	11	22	
No. of Hauls	4	5	4	4	4	4	4	4	4	4	41	
River chub	-	-	-	1	-	-	-	-	-	-	1	+
Spottail shiner	171	263	2	39	79	25	36	27	332	249	1228	29.8
Swallowtail shiner	-	-	10	-	-	-	-	-	-	-	10	0.2
Spotfin shiner	430	596	203	84	151	2	20	3	150	14	1653	40.1
Mimic shiner	6	-	31	3	-	-	-	-	-	-	40	1.0
Bluntnose minnow	1	5	4	-	4	1	-	-	-	7	18	0.4
Blacknose dace	-	1	-	-	-	-	-	-	-	-	1	+
Creek chub	-	-	1	-	-	-	-	-	-	-	1	+
Fallfish	3	1	2	3	2	3	1	2	20	3	42	1.0
Quillback	46	78	-	2	-	1	2	1	-	1	131	3.2
White sucker	120	95	28	53	99	49	14	12	13	19	582	12.2
Northern hog sucker	3	-	5	25	33	3	-	2	-	-	71	1.7
Shorthead redhorse	13	2	5	27	76	29	32	43	12	-	239	5.8
Redbreast sunfish	-	-	-	-	-	-	-	-	-	1	1	+
Pumpkinseed	-	-	-	-	-	3	-	-	-	-	3	0.1
Smallmouth bass	6	10	2	4	-	1	-	-	4	46	23	1.8
Largemouth bass	-	1	-	-	-	-	-	-	-	1	2	+
Black crappie	-	-	-	-	-	1	-	-	-	-	1	+
Tessellated darter	1	-	2	7	3	7	5	2	51	5	83	2.0
Banded darter	-	-	-	-	1	-	-	-	-	-	1	+
Shield darter	-	-	11	-	1	1	-	1	-	-	14	0.3
Walleye	2	-	-	-	-	1	-	-	-	2	5	0.1

+ Less than 0.05%.

Table 6.2-10

Fishes taken by seine on 14 June 1992 near 28186.

Station	DN-807-1392	DN-807-1085	DN-807-1085	DN-807-1219	DN-807-1201	DN-807-1142	DN-807-1062	DN-807-895	DN-807-803	DN-807-652	Total
Time	0859	0926	1219	1201	1121	1059	1036	1029	0958	1141	
Air Temp (C)	16.0	15.0	17.0	17.0	16.5	17.0	16.0	15.0	16.0	16.5	
Water Temp (C)	14.0	15.0	16.0	16.5	16.0	16.0	16.0	15.5	15.5	16.5	
Dissolved Oxygen (mg/l)	9.3	9.3	10.0	9.6	9.5	9.8	9.7	9.8	9.5	9.4	
pH	8.3	8.3	8.0	7.9	8.0	8.0	8.1	8.1	8.0	7.9	
Swathi Disc (cm)	28	30	66	28	28	28	28	28	30	15	
River Stage (ft)	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	
Weather	Overcast	Overcast	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	
No. of Specimens	894	965	308	447	93	102	90	229	847	585	4489
No. of Species	14	14	13	13	7	12	12	12	12	12	28
No. of Bauls	2	3	4	5	3	4	4	4	4	4	38
Central stromatolite	-	-	-	-	-	-	-	-	-	-	2
Golden shiner	-	1	1	-	-	-	-	-	-	-	2
Common shiner	-	-	-	2	1	-	-	1	-	-	4
Common shiner	-	-	-	-	-	-	-	-	-	-	1
Spottail shiner	23	692	2	189	5	2	7	38	248	61	1295
Smallmouth shiner	5	-	5	-	-	-	-	-	1	35	45
Spotfin shiner	673	377	270	119	77	1	40	138	99	287	1880
Kinnik shiner	1	3	7	6	-	2	2	1	2	2	28
Bluntnose minnow	2	16	3	-	-	1	-	1	1	20	42
Longnose dace	-	-	1	-	-	-	-	-	-	-	1
Fathead	3	1	7	4	-	-	-	-	11	8	30
White sucker	58	26	5	110	-	2	18	27	196	77	509
Northern hog sucker	-	-	-	-	-	3	1	-	-	-	4
Shorthead redhorse	1	8	6	5	-	-	1	-	3	-	13
Banded killifish	-	1	-	-	-	-	-	-	-	-	1
Rock bass	-	-	-	-	-	-	-	-	-	-	1
Redbreast sunfish	1	1	-	-	-	-	-	-	-	-	2
Pumpkinseed	-	1	-	-	-	-	-	-	-	-	1
Wingshell	-	3	-	-	-	-	-	-	-	-	3
Smallmouth bass	6	5	-	5	-	2	-	-	2	2	21
Largemouth bass	-	-	-	-	-	-	-	-	-	-	1
White crappie	1	1	-	-	-	1	-	-	-	1	3
Black crappie	-	1	-	-	-	-	-	-	-	-	1
Tessellated darter	42	7	2	26	4	61	6	17	232	110	509
Spotted darter	-	-	-	-	-	26	-	-	-	-	27
Yellow perch	2	3	-	-	-	-	-	-	-	-	5
Snowflake darter	-	-	1	-	-	1	-	1	-	-	3
Mudminnow	5	2	1	1	-	-	3	-	-	-	12

* Less than 0.057.

Table 6.2-11

Fishes taken by seine on 1 July 1982 near DMNR.

Station	TM-AUG-1385	TM-AUG-1085	TM-AUG-1645	TM-AUG-162	TM-AUG-16A1	TM-AUG-16A2	TM-AUG-795	TM-AUG-9A1	TM-AUG-793	TM-AUG-6A2	Total	% Catch
Time	1232	0847	1147	1125	1105	1054	0953	0935	0915	1024		
Air Temp (C)	24.5	21.0	21.0	20.0	19.5	20.0	19.0	19.5	19.0	20.0		
Water Temp (C)	22.5	22.0	23.0	22.0	22.0	22.0	21.0	20.5	21.0	20.5		
Dissolved Oxygen (mg/l)	8.7	9.0	9.2	9.4	9.4	9.3	8.6	8.5	8.4	8.0		
pH	7.6	8.1	8.2	7.7	7.9	8.0	7.7	8.0	7.0	7.5		
Secchi Disc (cm)	46	51	64	56	56	46	58	41	64	96		
River Stage (m)	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40		
Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear		
No. of Specimens	228	421	251	129	68	76	53	106	123	147	1452	
No. of Species	10	6	10	7	6	7	5	4	5	11	17	
No. of Hauls	4	6	4	5	4	4	4	4	4	4	43	
Gizzard shad	-	-	-	1	-	-	-	-	-	-	1	0.1
Comely shiner	-	-	1	3	3	-	-	-	-	-	6	0.4
Common shiner	-	-	-	-	1	-	-	-	-	-	1	0.1
Spottail shiner	60	194	150	41	17	46	20	91	79	69	791	47.9
Swallowtail shiner	2	-	1	-	-	-	-	-	-	-	3	0.2
Sportin shiner	157	253	70	80	42	12	7	7	-	3	411	27.0
Mintc shiner	2	-	7	-	-	-	-	-	-	-	9	0.5
Bluntnose minnow	3	-	1	-	-	-	-	-	-	-	18	1.3
Fathead minnow	-	-	-	-	-	-	-	-	-	-	1	0.1
Creek chub	-	-	-	-	-	-	-	-	-	-	2	0.1
Fatfish	6	1	6	-	5	5	8	-	1	10	42	2.5
White sucker	7	7	3	2	-	4	13	2	6	10	54	3.3
Pumpkinseed	1	-	-	-	1	-	-	-	-	-	1	0.2
Smallmouth bass	-	3	2	-	-	1	-	-	-	2	9	0.5
Largemouth bass	-	-	-	-	-	-	-	-	-	-	1	0.1
Tessellated darter	8	13	10	1	-	7	5	6	30	4	92	5.6
Hillys	2	-	-	-	-	1	-	-	1	-	4	0.2

Table 6.2-12

Fishes taken by seine on 19 July 1982 near DMNR.

Station	TM-AUG-1385	TM-AUG-1045	TM-AUG-1645	TM-AUG-162	TM-AUG-16A1	TM-AUG-16A2	TM-AUG-795	TM-AUG-9A1	TM-AUG-793	TM-AUG-6A2	Total	% Catch
Time	0843	1149	0907	0939	1024	1039	1100	1116	1131	1005		
Air Temp (C)	29.5	33.0	28.5	27.7	29.0	28.5	28.5	28.5	29.5	29.5		
Water Temp (C)	29.0	31.5	29.5	28.5	29.0	28.5	28.5	29.0	29.5	29.5		
Dissolved Oxygen (mg/l)	10.6	14.6	7.1	7.4	7.6	7.6	7.8	8.1	7.9	11.0		
pH	8.7	9.1	8.7	8.2	8.3	8.2	8.2	8.3	8.2	8.6		
Secchi Disc (cm)	61	36	66*	64	64	66	56	58	54	89		
River Stage (m)	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13	1.13		
Weather	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear		
No. of Specimens	88	327	211	69	11	56	130	9	297	77	1781	
No. of Species	6	7	9	7	6	6	7	3	6	5	21	
No. of Hauls	4	6	6	5	4	4	4	4	4	5	46	
Common carp	-	-	-	-	1	-	-	-	-	-	1	0.1
Comely shiner	-	-	25	-	-	1	-	-	-	-	26	2.0
Common shiner	-	1	-	-	-	-	-	-	-	-	1	0.1
Spottail shiner	49	25	6	5	1	6	56	-	9	-	207	26.2
Swallowtail shiner	1	-	-	-	-	-	-	-	-	-	1	0.1
Sportin shiner	21	234	169	60	4	43	22	5	-	46	586	45.6
Mintc shiner	-	-	1	-	-	1	-	-	-	1	3	0.2
Bluntnose minnow	-	13	2	-	-	-	3	-	1	-	19	1.5
Creek chub	-	-	-	-	-	-	-	-	-	-	1	0.1
Fatfish	7	-	4	1	-	1	1	-	-	-	16	1.1
Quillback	-	-	-	-	1	-	-	-	-	-	1	0.1
White sucker	3	-	-	12	-	-	1	-	-	-	16	1.2
Northern hog sucker	-	-	1	1	-	-	-	-	-	-	2	0.2
Shorthead redhorse	-	-	1	-	-	-	-	-	-	-	1	0.1
Brown bullhead	-	-	-	-	-	-	-	-	132	-	262	20.5
Channel catfish	-	-	-	-	-	-	-	1	-	-	1	0.1
Pumpkinseed	-	1	-	-	-	-	-	-	-	-	1	0.1
Smallmouth bass	-	1	-	1	1	-	1	-	-	1	5	0.4
Black crappie	-	-	-	-	-	-	-	-	2	-	2	0.2
Perca spp.	-	-	-	-	-	-	-	-	1	-	1	0.1
Tessellated darter	7	2	2	9	2	4	12	3	22	28	132	10.1

* Clear to bottom indicated depth.

Table 6.2-13

Fishes taken by seine on 2 August 1982 near DNRB.

Species	TN-AQF-1385		TN-AQF-1095		TN-AQF-1603		TN-AQF-162		TN-AQF-1601		TN-AQF-1062		TN-AQF-983		TN-AQF-961		TN-AQF-462		Totals	%
	Tagg	Base	Tagg	Base	Tagg	Base	Tagg	Base	Tagg	Base	Tagg	Base	Tagg	Base	Tagg	Base	Tagg	Base		
Air Temp (C)	27.0		22.0		25.0		23.0		23.5		22.5		21.5		21.0		21.0		1028	
Water Temp (C)	26.0		24.5		26.0		24.5		26.5		23.5		26.5		26.5		26.5		25.0	
Dissolved Oxygen (mg/l)	3.2-6		11.6		9.2		8.6		7.9		7.8		8.2		8.3		8.1		26.5	
pH	8.6		8.7		8.8		8.1		8.2		8.1		8.1		8.2		8.3		11.6	
Secchi Disc (cm)	46		56		58		36		36		30		36		36		35		66	
River Stage (m)	1.19		1.19		1.19		1.19		1.19		1.19		1.19		1.19		1.19		1.19	
Snaglier	1165		836		105		670		1649		1342		104		32		443		6426	
No. of Specimens	11		9		6		13		10		12		8		5		8		26	
No. of Species	4		5		5		5		5		6		6		6		6		66	
Common carp	-		-		-		1		-		-		-		-		-		1	
River chub	-		1		-		-		-		-		-		-		-		2	
Golden shiner	1		-		-		3		2		4		-		-		-		10	
Common shiner	3		-		-		3		3		3		4		4		4		9	
Common shiner	4		-		-		3		3		2		4		4		6		43	
Spot tail shiner	19		-		1		6		3		3		6		3		6		12	
Semifourtail shiner	3		-		-		-		-		3		-		-		-		3	
Spotfin shiner	957		690		95		327		211		1790		18		18		21		6227	
Mud shiner	205		32		3		32		87		224		28		3		3		516	
Notropis spp.	-		-		-		-		-		3		-		-		-		3	
Bluntnose minnow	30		11		-		-		5		16		12		2		2		78	
Blacknose dace	-		1		-		-		-		-		-		-		-		1	
Creek chub	-		-		-		1		-		-		-		-		-		1	
Fallfish	-		-		-		-		-		-		-		-		-		1	
Orillback	3		5		5		21		-		-		2		2		3		5	
White sucker	-		-		-		2		-		-		-		-		-		2	
Brown bullhead	-		-		-		2		-		-		-		-		-		2	
Banded killifish	-		1		-		-		-		-		-		-		-		1	
Rock bass	-		-		-		5		-		-		-		-		-		5	
Pumpkinseed	-		-		-		-		-		-		-		-		-		4	
Bluegill	36		88		2		218		837		6		29		20		602		1693	
Smallmouth bass	-		-		-		-		-		-		-		-		-		3	
Largemouth bass	-		-		-		-		-		-		-		-		-		9	
Resplendent darter	6		-		-		-		-		-		-		-		-		3	
Shield darter	-		-		-		-		1		6		8		2		25		54	
Wallace	-		-		1		-		1		-		-		-		-		1	

* Less than 0.05%.

Table 6.2-14

Fishes taken by seine on 19 August 1982 near ININS.

Station	TM-AQF-13B5	TM-AQF-10B5	TM-AQF-16A5	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9B6	TM-AQF-9A1	TM-AQF-9B3	TM-AQF-6A2	Total	% Catch
Time	1226	1537	1249	1314	1406	1427	1447	1507	1522	1343		
Water Temp (C)	28.0	28.5	28.0	27.0	27.5	27.0	28.0	28.0	28.0	28.0		
Dissolved Oxyge. (mg/l)	10.8	13.6	10.4	11.1	11.2	10.8	11.4	11.6	12.0	12.0		
pH	8.7	9.1	9.4	8.4	8.4	8.1	8.5	8.6	8.8	8.7		
Secchi Disc (cm)	51	71	46*	58	56	38	36	38	36	26		
River Stage (m)	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01		
Weather	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy		
No. of Specimens	2247	2732	248	1079	559	584	438	17	14	77	7995	
No. of Species	11	10	7	11	6	5	5	5	4	8	20	
No. of Haule	3	6	6	2	4	4	4	4	4	6	44	
Gizzard shad	-	-	-	-	-	-	-	-	1	-	1	+
Golden shiner	6	4	-	6	-	-	-	-	-	-	16	0.2
Comely shiner	-	-	-	4	2	-	-	-	-	-	6	0.1
Common shiner	2	-	-	-	-	-	-	-	-	-	2	+
Spottail shiner	30	2	-	6	-	-	-	-	-	-	39	0.5
Swallowtail shiner	27	25	5	-	-	15	5	-	-	1	77	1.0
Spotfin shiner	1468	2175	212	578	530	418	339	11	-	11	5742	71.8
Mimic shiner	599	369	24	40	10	105	86	-	-	-	1234	15.4
Bluntnose minnow	50	35	1	5	3	37	6	-	1	20	158	2.0
Fallfish	-	-	3	-	-	-	-	-	-	-	3	+
Quillback	3	8	-	-	-	-	-	-	-	-	11	0.1
Brown bullhead	-	-	-	1	-	-	-	1	-	-	2	+
Channel catfish	-	-	-	-	-	-	-	-	8	-	8	0.1
Redbreast sunfish	-	-	-	-	-	-	-	-	-	1	1	+
Pumpkinseed	40	33	-	303	1	-	-	-	-	16	393	4.9
Bluegill	6	10	-	42	13	-	-	-	-	10	81	1.0
Pumpkinseed/Bluegill	10	69	-	86	-	-	-	-	4	-	169	2.1
Smallmouth bass	-	-	1	-	-	-	-	1	-	-	2	+
Largemouth bass	-	-	-	-	-	-	-	-	-	1	1	+
Tessellated darter	6	2	-	7	-	9	2	3	-	-	46	0.6
Banded darter	-	-	2	1	-	-	-	-	-	-	3	+

* Clear to bottom at indicated depth.

+ Less than 0.05%.

Table 6.2-15

Fish taken by seine on 1 September 1982 near DMNS.

Station	DM-AQ-1285	DM-AQ-1285	DM-AQ-1265	DM-AQ-127	DM-AQ-1261	DM-AQ-1262	DM-AQ-286	DM-AQ-261	DM-AQ-263	DM-AQ-262	Total	% Catch
Time	1157	0850	1130	1105	1071	1050	0909	0830	0812	1047		
Air Temp (°C)	22.0	22.0	23.0	21.5	22.0	22.0	21.0	21.5	22.0	22.0		
Water Temp (°C)	22.5	22.5	22.0	22.5	22.0	22.5	22.5	22.5	22.0	22.5		
Dissolved Oxygen (mg/l)	9.2	10.4	9.8	10.0	9.7	9.2	9.5	9.8	10.0	11.6		
pH	8.1	8.6	8.7	8.1	8.1	8.0	8.3	8.3	8.3	8.6		
Secchi Disc (cm)	61	69	69*	58	38	38	56	58	43	46		
River Stage (m)	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98		
Weather	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast		
No. of specimens	3199	2497	533	447	190	3766	440	490	293	170	11743	
No. of species	9	8	5	11	5	5	5	5	6	6	19	
No. of Bags	2	6	2	2	2	1	2	2	2	2	63	
River chub	-	-	-	1	-	-	-	-	-	-	1	*
Golden shiner	2	8	-	1	-	2	-	-	-	-	13	0.1
Common shiner	-	-	3	1	-	-	-	-	-	-	4	*
Common shiner	1	-	-	-	-	-	-	-	-	-	1	*
Sportall shiner	10	-	-	2	10	-	-	4	5	-	31	0.3
Smallmouth shiner	18	3	10	-	-	1	-	-	-	-	32	0.3
Sportall shiner	2573	2383	51	271	77	3692	474	382	143	1	10967	88.3
White shiner	137	55	68	1	1	68	12	1	12	-	326	2.7
Bluntnose minnow	38	6	-	7	-	-	3	3	2	38	97	0.8
Fathead	-	-	1	-	-	-	-	-	-	-	1	*
Redbreast sunfish	-	-	-	1	-	-	-	-	-	6	7	0.1
Pumpkinseed	148	12	-	167	-	-	1	-	3	18	344	2.9
Bluegill	286	1	-	9	11	-	-	-	-	23	330	2.8
Pumpkinseed/bluegill	36	28	-	-	-	-	-	-	-	-	64	0.5
Smallmouth bass	-	-	-	1	-	-	-	-	-	-	1	*
White crappie	-	1	-	-	-	-	-	-	-	-	1	*
Spotted darter	-	-	-	6	-	3	1	10	18	14	52	0.4

* Clear to bottom at indicated depth.

* Less than 0.05%.

Table 6.2-16

Fish taken by seine on 14 September 1982 near DMNS.

Station	DM-AQ-1285	DM-AQ-1285	DM-AQ-1265	DM-AQ-127	DM-AQ-1261	DM-AQ-1262	DM-AQ-286	DM-AQ-261	DM-AQ-263	DM-AQ-262	Total	% Catch
Time	1220	1531	1237	1307	1357	1425	1634	1650	1509	1336		
Air Temp (°C)	25.0	25.5	26.0	24.0	24.0	25.0	25.5	25.5	25.0	26.5		
Water Temp (°C)	24.5	26.0	24.0	24.0	24.5	24.5	25.5	25.0	25.5	26.0		
Dissolved Oxygen (mg/l)	11.5	13.8	9.7	11.0	10.4	10.4	12.4	11.8	12.6	12.2		
pH	8.4	8.4	8.8	8.1	8.2	8.2	8.7	8.5	8.6	8.8		
Secchi Disc (cm)	43	66*	66*	48	46	43	43	43	43	58		
River Stage (m)	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96		
Weather	Haze	Partly Cloudy	Haze	Haze	Partly Cloudy	Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy	Partly Cloudy		
No. of specimens	1667	886	467	1065	141	1317	1683	243	286	147	7622	
No. of species	7	7	5	12	4	7	5	7	6	6	18	
No. of Bags	1	5	5	6	2	4	3	4	5	4	41	
Central stoneroller	-	-	-	-	-	-	-	1	-	-	1	*
Golden shiner	-	2	-	-	-	-	-	-	-	-	2	*
Common shiner	-	-	-	-	-	2	-	-	-	-	2	*
Common shiner	-	-	-	-	-	1	-	-	-	-	1	*
Sportall shiner	1	-	-	2	-	-	-	5	1	-	9	0.1
Smallmouth shiner	21	3	4	5	-	7	-	-	-	-	40	0.5
Rosyface shiner	-	-	-	1	-	-	-	-	-	-	1	*
Sportall shiner	1193	866	412	937	134	1167	1685	230	277	36	6098	80.1
White shiner	197	9	26	30	1	133	9	4	1	-	408	5.3
Bluntnose minnow	35	1	-	4	-	2	2	-	1	2	52	0.7
Fathead	-	-	1	-	-	-	-	-	-	-	1	*
Quillback	-	-	-	1	-	-	-	-	-	-	1	*
Channel catfish	-	-	-	17	-	-	-	-	-	-	17	0.2
Redbreast sunfish	-	-	-	-	-	-	-	-	-	1	1	*
Pumpkinseed	144	4	-	59	-	-	6	1	3	17	229	3.0
Bluegill	58	1	-	5	5	-	1	1	-	106	1.4	
Smallmouth bass	-	-	1	1	1	4	-	-	-	-	7	0.1
Spotted darter	-	-	-	3	-	-	-	1	8	5	17	0.2

* Clear to bottom at indicated depth.

* Less than 0.05%.

Table 6.2-17

Fishes taken by seine on 5 October 1982 near TMINS.

Station	TM-AQF-13B5	TM-AQF-10B5	TM-AQF-16A5	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9B6	TM-AQF-9A1	TM-AQF-9B3	TM-AQF-	Total	% Catch
Time	1217	0854	1146	1120	1060	1020	0955	0940	0926	1101		
Air Temp (C)	17.5	16.5	17.5	16.5	16.0	16.0	15.0	16.0	16.0	17.5		
Water Temp (C)	19.0	18.5	19.0	18.5	18.5	18.5	18.5	18.5	18.5	18.5		
Dissolved Oxygen (mg/l)	10.2	9.0	9.6	10.2	10.4	9.1	9.4	9.2	9.0	9.6		
pH	8.2	8.0	8.2	7.8	7.8	7.7	7.7	7.6	7.7	7.8		
Secchi Disc (cm)	91*	81	86*	56	58	58	58	56	58	71		
River Stage (m)	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99		
Weather	Partly Cloudy	Overcast	Partly Cloudy	Overcast	Overcast	Overcast	Overcast	Overcast	Overcast	Partly Cloudy		
No. of Specimens	2247	1341	410	299	5	1268	1453	12	12	327	7350	
No. of Species	9	6	4	5	3	7	5	3	2	5	14	
No. of Hauls	2	6	5	5	4	4	4	4	5	4	43	
Golden shiner	4	4	-	-	-	-	-	-	-	-	8	0.1
Comely shiner	-	-	-	-	-	1	-	-	-	-	1	+
Common shiner	1	-	-	-	-	-	-	-	-	-	1	+
Spottail shiner	-	-	-	-	-	1	-	-	-	-	1	+
Swallowtail shiner	9	1	9	-	-	25	7	-	-	-	51	0.7
Spotfin shiner	1590	1320	388	232	-	1119	1439	8	10	-	6106	83.1
Mimic shiner	111	11	12	-	-	82	4	-	-	-	220	3.0
Bluntnose minnow	17	-	-	-	-	18	1	-	-	19	55	0.7
Redbreast sunfish	-	-	1	-	-	-	-	-	-	-	1	+
Green sunfish	1	-	-	-	-	-	-	-	-	-	1	+
Pumpkinseed	319	3	-	50	1	-	2	3	2	118	498	6.8
Bluegill	191	2	-	12	1	2	-	-	-	187	395	5.4
Tessellated darter	-	-	-	4	3	-	-	1	-	2	10	0.1
Banded darter	-	-	-	1	-	-	-	-	-	-	1	+

* Clear to bottom at indicated depth.

+ Less than 0.05%.

Table 6.2-18

Fishes taken by seine on 18 October 1982 near TMINS.

Station	TM-AQF-13B5	TM-AQF-10B5	TM-AQF-16A5	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-9B6	TM-AQF-9A1	TM-AQF-9B3	TM-AQF-4A2	Total	% Catch
Time	0850	1133	0912	0936	1023	1036	1052	1108	1120	1000		
Air Temp (C)	2.0	7.5	2.0	3.0	4.5	7.0	5.5	6.0	7.5	4.0		
Water Temp (C)	9.0	11.0	8.0	9.0	9.0	9.5	9.5	9.5	10.0	10.0		
Dissolved Oxygen (mg/l)	11.5	10.4	10.8	10.2	10.2	10.4	10.4	10.8	10.4	11.8		
pH	8.2	8.1	7.7	7.7	7.6	7.6	7.7	7.6	7.6	8.2		
Secchi Disc (cm)	126*	97	66*	94	96*	89	81	91	86	41		
River Stage (m)	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95		
Weather	Fog	Partly Cloudy	Fog	Clear	Clear	Clear	Clear	Clear	Partly Cloudy	Clear		
No. of Specimens	3270	930	140	354	1	72	2422	11	1	63	7264	
No. of Species	5	7	3	3	1	7	4	2	1	3	11	
No. of Hauls	1	6	5	5	5	4	4	5	4	2	43	
Golden shiner	-	25	-	-	-	-	-	-	-	-	25	0.3
Common shiner	-	-	-	-	-	1	-	-	-	-	1	+
Spottail shiner	-	-	-	-	-	6	-	-	-	-	6	0.1
Swallowtail shiner	2	-	1	-	-	-	1	-	-	-	4	0.1
Spotfin shiner	3227	856	132	342	1	58	2419	10	1	-	7066	97.0
Mimic shiner	3	3	7	-	-	2	1	-	-	-	16	0.2
Bluntnose minnow	-	-	-	-	-	2	1	-	-	-	3	+
Banded killifish	-	1	-	-	-	-	-	-	-	-	1	+
Pumpkinseed	10	23	-	11	-	2	-	-	-	25	71	1.0
Bluegill	28	20	-	1	-	1	-	1	-	32	83	1.1
Tessellated darter	-	2	-	-	-	-	-	-	-	6	8	0.1

* Clear to bottom at indicated depth.

+ Less than 0.05%.

Table 6.2-19

Fishes taken by seine on 1 November 1981, near TMMS.

Station	TM-AQF-1385	TM-AQF-1385	TM-AQF-1445	TM-AQF-142	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-989	TM-AQF-9A1	TM-AQF-9.2	TM-AQF-6A2	Total	% Catch
Time	1545	1229	1520	1502	1416	1359	1391	1314	1254	1442		
Air Temp (C)	13.5	17.5	14.0	14.0	14.5	15.0	15.5	14.0	14.0	14.0		
Water Temp (C)	17.5	17.5	16.0	15.5	16.0	16.5	16.5	16.5	16.5	15.5		
Dissolved Oxygen (mg/l)	10.8	11.8	10.0	10.7	13.5	10.8	9.8	10.3	10.4	9.8		
pH	8.1	8.4	8.6	7.9	8.3	7.7	7.5	7.6	7.7	7.6		
Secchi Disc (cm)	56	69	66	33	51	53	58	54	61	58		
River Stage (m)	0.53	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		
Weather	Light Rain	Overcast	Heavy Rain	Heavy Rain	Heavy Rain	Light Rain	Light Rain	Heavy Rain	Heavy Rain	Heavy Rain		
No. of Specimens	1667	522	1060	69	15	3311	1312	160	57	15	4195	
No. of Species	9	9	9	4	3	9	4	5	3	5	17	
No. of Bait	4	5	5	5	4	4	7	4	6	4	42	
Clearhead shad	-	-	-	-	-	1	-	-	-	-	1	*
Golden shiner	5	92	1	-	-	1	-	-	-	-	106	1.3
Comely shiner	-	-	-	-	-	1	-	-	-	-	1	*
Common shiner	1	-	-	-	-	-	-	-	-	-	1	*
Spottail shiner	1	-	3	-	1	1	-	-	2	-	9	0.1
Swallowtail shiner	2	-	4	-	-	2	-	-	-	-	8	0.1
Spotfin shiner	1638	282	1066	50	12	3296	1305	157	51	12	7809	95.3
Minic shiner	7	2	37	-	2	4	5	3	-	-	42	0.8
Bluntnose minnow	3	2	1	-	-	1	1	-	-	-	8	0.1
Creek chub	-	1	-	-	-	-	-	-	-	-	1	*
Pellifish	-	-	2	-	-	-	-	-	-	-	2	*
Hooded killifish	-	1	-	-	-	-	-	-	-	-	1	*
Redbreast sunfish	-	-	-	-	-	-	-	-	-	2	2	*
Pumpkinseed	2	33	-	17	-	2	1	-	-	1	56	0.7
Bluegill	3	103	3	1	-	-	-	2	-	1	113	1.4
Smallmouth bass	-	-	-	-	-	-	-	1	-	-	1	*
Unidentified darter	-	1	3	1	-	-	-	5	2	2	16	0.2

* Less than 0.05%.

Table 6.2-20

Fishes taken by seine on 16 November 1982 near TMMS.

Station	TM-AQF-1383	TM-AQF-1083	TM-AQF-16A5	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-989	TM-AQF-9A1	TM-AQF-9B3	TM-AQF-6A2	Total	% Catch
Time	1536	1234	1513	1451	1405	1367	1375	1310	1254	1430		
Air Temp (C)	4.5	6.5	7.0	7.0	6.5	7.0	7.0	6.5	6.5	6.5		
Water Temp (C)	6.0	6.0	6.0	7.0	6.5	6.5	7.0	6.5	6.5	7.5		
Dissolved Oxygen (mg/l)	12.0	12.1	12.8	11.2	11.5	11.4	11.5	11.8	11.5	11.0		
pH	8.0	7.7	7.9	7.3	7.3	7.3	7.3	7.5	7.3	7.3		
Secchi Disc (cm)	66	127	69*	66	41	41	41	38	36	28		
River Stage (m)	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08		
Weather	Partly Cloudy	Clear	Partly Cloudy	Partly Cloudy	Clear	Clear	Clear	Clear	Clear	Clear		
No. of Specimens	2246	161	205	8	4	444	592	5	1	14	3462	
No. of Species	7	5	3	1	2	5	2	1	1	3	11	
No. of Bait	2	5	5	5	4	4	4	5	5	4	42	
Golden shiner	4	21	-	-	-	-	-	-	-	-	25	0.7
Spottail shiner	-	-	-	-	1	-	-	-	-	-	1	*
Swallowtail shiner	15	-	3	-	-	1	-	-	-	-	19	0.5
Spotfin shiner	2194	114	196	8	5	440	592	5	1	-	3556	97.1
Minic shiner	10	-	4	-	-	2	1	-	-	-	17	0.7
Bluntnose minnow	3	-	-	-	-	-	-	-	-	-	3	0.1
Hooded killifish	-	2	-	-	-	-	-	-	-	-	2	0.1
Rock bass	-	1	-	-	-	-	-	-	-	-	1	*
Pumpkinseed	1	3	-	-	-	1	-	-	-	3	8	0.2
Bluegill	7	-	-	-	-	2	-	-	-	2	11	0.3
Unidentified darter	-	-	-	-	-	-	-	-	-	2	2	0.2

* Clear to bottom at indicated depth.

+ Less than 0.05%.

Table 6.2-21

Fishes taken by seine on 2 December 1982 near IMINS.

Station	TM-AQF-1385	TM-AQF-1085	TM-AQF-16A5	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-986	TM-AQF-9A1	TM-AQF-983	TM-AQF-9A2	Total	% Catch
Time	1546	1230	1520	1503	1427	1403	1338	1323	1259	1445		
Air Temp (C)	10.9	13.0	10.0	10.0	10.0	10.0	10.0	11.0	12.0	10.0		
Water Temp (C)	8.0	8.0	5.5	8.0	7.5	7.5	8.0	8.0	8.0	8.0		
Dissolved Oxygen (mg/l)	11.0	11.0	12.2	11.7	11.2	11.4	11.4	11.6	11.6	11.1		
pH	7.7	7.6	7.5	7.5	7.4	7.5	7.3	7.4	7.5	7.5		
Secchi Disc (cm)	40	66	117*	89	89	58	61	66	71	64		
River Stage (m)	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35		
Weather	Fog	Overcast	Fog	Fog	Fog	Fog	Overcast	Overcast	Overcast	Overcast		
No. of Specimens	754	20	70	1285	8	291	156	5	-	154	2743	
No. of Species	7	2	2	3	2	2	2	2	-	4	31	
No. of hauls	4	2	5	5	4	4	4	4	4	4	45	
Golden shiner	-	1	-	-	-	-	-	-	-	-	1	+
Cosely shiner	-	-	-	3	-	-	-	-	-	-	3	0.1
Spottail shiner	2	-	-	-	-	-	-	-	NO	-	2	0.1
Swallowtail shiner	7	-	-	2	-	-	-	2	-	-	9	0.3
Spotfin shiner	16	18	69	1280	7	290	155	4	-	37	2526	99.9
Mimic shiner	23	1	-	-	-	1	-	-	FISH	-	25	0.9
Rock bass	-	-	-	-	-	-	-	-	-	1	1	+
Redbreast sunfish	1	-	1	-	1	-	-	-	-	-	3	0.1
Pumpkinseed	1	-	-	-	-	-	-	-	TAKEN	14	15	0.5
Bluegill	4	-	-	-	-	-	1	-	-	102	107	3.9
Unassociated detrit	-	-	-	-	-	-	-	1	-	-	1	+

* Clear to bottom at indicated depth.

+ Less than 0.05%.

Table 6.2-22

Fishes taken by seine on 14 and 20 December 1982 near IMINS.

Station	TM-AQF-1385	TM-AQF-1085 ¹	TM-AQF-16A5	TM-AQF-1A2	TM-AQF-16A1	TM-AQF-10A2	TM-AQF-986 ¹	TM-AQF-9A1 ¹	TM-AQF-983 ¹	TM-AQF-9A2 ¹	Total	% Catch
Time	1521	1335	1452	1428	1354	1336	1449	1425	1405	1325		
Air Temp (C)	1.5	4.5	4.0	2.0	2.0	2.6	3.5	1.5	1.5	2.5		
Water Temp (C)	1.0	2.5	1.5	1.0	1.5	1.0	2.0	2.0	2.0	2.5		
Dissolved Oxygen (mg/l)	14.4	13.2	14.6	13.8	13.8	13.8	13.4	13.5	13.5	13.2		
pH	8.4	8.0	8.7	7.9	8.1	8.0	8.0	8.0	8.0	8.1		
Secchi Disc (cm)	142*	74	86*	173*	155*	15*	20	33	64	109		
River Stage (m)	1.13	1.35	1.13	1.13	1.13	1.13	1.35	1.35	1.35	1.35		
Weather	Clear	Overcast	Clear	Clear	Clear	Clear	Overcast	Overcast	Overcast	Overcast		
No. of Specimens	1221	47	131	-	4	27	397	234	18	24	2107	
No. of Species	3	1	1	-	1	1	4	3	4	4	9	
No. of hauls	3	6	5	4	4	4	4	4	4	4	41	
Muskellunge	-	-	-	-	-	-	-	-	1	-	1	+
Cosely shiner	-	-	-	NO	-	-	1	1	-	-	2	0.1
Spottail shiner	-	-	-	-	-	-	-	1	-	-	1	0.1
Swallowtail shiner	3	-	-	-	-	-	-	-	-	1	4	0.2
Spotfin shiner	1217	47	131	FISH	4	27	393	234	15	23	2091	99.2
Mimic shiner	1	-	-	-	-	-	1	-	-	-	2	0.1
Pumpkinseed	-	-	-	-	-	-	-	-	-	1	1	+
Bluegill	-	-	-	TAKEN	-	-	2	-	1	-	3	0.1
White crappie	-	-	-	-	-	-	-	-	-	1	1	+

¹ Sampling not attempted on 14 December due to ice; rescheduled and completed on 20 December.

* Clear to bottom at indicated depth.

+ Less than 0.05%.

Table 4.2-23

Summary of fishes taken at seine station TN-AOF-1085 in 1962.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Common shiner	-	-	-	-	-	-	-	-	-	-	-	-	25	0.1
Comely shiner	21	-	-	-	-	-	-	3	-	-	-	-	24	0.1
Spotail shiner	37	-	-	11	21	182	109	8	-	-	-	-	467	1.3
Swallowtail shiner	13	-	-	31	28	5	0	30	39	21	17	10	191	0.5
Spottail shiner	-	-	-	-	-	-	-	-	-	-	-	-	3	0.01
Spottail shiner	3301	NO	1801	3383	1716	1103	158	2625	3714	4817	3834	1933	27586	73.3
Nimble shiner	303	-	565	349	537	7	7	704	534	114	25	24	2764	7.3
Bluntnose minnow	25	-	64	74	8	8	3	80	73	17	6	-	360	1.0
Fallfish	-	-	-	-	-	-	13	-	-	-	-	-	13	0.04
Quillback	-	-	-	-	-	48	-	4	-	-	-	-	52	0.14
White sucker	-	-	-	-	-	178	10	-	-	-	-	-	188	0.5
Shorthead redhorse	-	-	-	-	-	3	-	-	-	-	-	-	3	0.01
Banded killifish	-	SAMPLES	-	-	-	14	-	-	-	-	-	-	14	0.04
Rock bass	-	-	-	-	-	-	-	-	-	-	-	-	1	0.003
Redbreast sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1	0.003
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1	0.003
Pumpkinseed	-	-	-	-	-	-	-	40	292	320	3	-	645	1.7
Pumpkinseed/Bluegill	-	TAKEN	-	-	-	-	-	6	347	219	10	-	572	1.5
Smallmouth bass	-	-	-	-	-	10	-	48	36	-	-	-	94	0.25
White crappie	-	-	-	-	-	1	-	-	-	-	-	-	1	0.003
Tessellated darter	-	-	-	-	-	43	15	12	-	-	-	-	70	0.19
Yellow perch	-	-	-	-	-	2	-	-	-	-	-	-	2	0.006
Walleye	-	-	-	-	-	7	2	-	-	-	-	-	9	0.024
No. of specimens	3700		2181	3832	1802	1828	318	3612	4868	5573	3906	1871	33130	
No. of species	3		5	8	11	16	10	12	9	9	9	7	25	
No. of hauls	2		6	5	6	6	6	7	5	3	6	7	60	
No./Haul	1850.00		363.50	642.00	300.33	271.33	53.00	517.43	973.60	1857.67	651.00	268.14	552.17	
Diversity Index	0.83		0.89	0.89	1.23	1.68	1.83	1.35	1.30	0.77	0.18	0.18	1.07	

* Less than 0.05%.

Table 4.2-24

Summary of fishes taken at seine station TN-AOF-1085 in 1962.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Common shiner	-	-	-	-	-	-	-	-	-	-	-	-	1	0.003
Comely shiner	-	-	-	-	-	-	-	1	-	-	-	-	1	0.003
Spotail shiner	-	-	-	-	-	-	-	4	10	29	118	1	165	0.4
Common shiner	-	-	3	12	4	-	-	-	-	-	-	-	19	0.05
Spotail shiner	-	-	-	-	-	-	1	-	-	-	-	-	1	0.003
Swallowtail shiner	-	-	-	-	-	935	269	2	-	-	-	-	1206	3.0
Spottail shiner	3	NO	1116	578	3216	773	487	2865	3249	2176	396	65	14978	38.0
Nimble shiner	-	-	-	6	58	3	-	401	64	14	7	1	549	1.4
Bluntnose minnow	-	-	2	8	32	19	13	46	7	-	2	-	127	0.3
Blacknose dace	-	-	-	-	-	-	1	-	-	-	-	-	1	0.003
Creek chub	-	-	-	-	-	-	-	1	-	-	-	-	1	0.003
Fallfish	-	-	-	-	-	-	-	-	-	-	1	-	1	0.003
Quillback	-	-	-	-	-	2	1	-	-	-	-	-	3	0.008
White sucker	-	SAMPLES	-	-	-	78	-	13	-	-	-	-	91	0.23
Shorthead redhorse	-	-	-	-	-	2	119	7	-	-	-	-	128	0.3
Banded killifish	-	-	-	-	-	10	-	-	-	-	-	-	10	0.03
Rock bass	-	-	-	-	-	1	-	1	-	1	3	-	6	0.016
Redbreast sunfish	-	-	-	-	-	-	-	-	-	-	1	-	1	0.003
Pumpkinseed	-	-	-	-	-	1	1	-	-	-	-	-	2	0.005
Bluegill	-	-	-	-	-	1	3	33	36	26	36	-	114	0.3
Pumpkinseed/Bluegill	-	TAKEN	-	-	-	-	-	15	2	27	103	-	147	0.4
Smallmouth bass	-	-	-	-	-	11	4	157	28	-	-	-	195	0.5
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	-	1	0.003
White crappie	-	-	-	-	-	1	-	-	-	-	-	-	1	0.003
Black crappie	-	-	-	-	-	1	-	-	-	-	-	-	1	0.003
Tessellated darter	-	-	-	-	-	7	15	2	-	2	-	-	26	0.07
Yellow perch	-	-	-	-	-	3	-	-	-	-	1	-	5	0.013
Walleye	-	-	-	-	-	2	-	-	-	-	-	-	2	0.005
No. of specimens			1122	608	3320	1807	748	3566	3383	2271	663	67	17806	
No. of species	1		4	7	10	21	9	13	8	8	10	3	28	
No. of hauls	4		9	9	8	9	11	12	11	12	10	13	108	
No./Haul	1.25		124.67	66.00	115.75	221.89	66.50	297.17	307.55	189.25	66.30	5.15	164.87	
Diversity Index	0.00		0.05	0.36	0.26	1.75	1.30	1.09	0.33	0.34	1.45	0.21	1.09	

* Less than 0.05%.

Table 4.2-25

Summary of fishes taken at seine Station TM-AQF-16A7 in 1962.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Golden shiner	-	-	-	-	-	1	-	-	-	-	-	-	1	+
Comely shiner	-	-	-	-	-	26	-	3	-	-	-	-	29	0.6
Spottail shiner	-	-	9	1	4	156	-	-	-	-	-	-	174	3.6
Swallowtail shiner	-	-	1	14	14	1	3	14	10	7	-	-	68	1.4
Koysface shiner	-	-	1	1	-	-	-	-	-	-	-	-	2	+
Spottin shiner	NO	NO	3	26	311	473	239	307	863	520	1202	200	4164	84.9
Miami shiner	-	-	1	77	38	8	25	92	19	47	-	-	303	6.2
Bluntnose shiner	-	-	3	13	7	3	1	-	-	-	-	-	28	0.6
Long-ear chub	-	-	-	-	1	-	-	-	-	-	-	-	1	+
Creek chub	-	-	-	-	1	-	-	-	-	-	-	-	1	+
Fallfish	-	-	-	-	9	10	-	2	-	-	-	-	31	0.6
White sucker	FISH	SAMPLED	-	-	33	3	-	-	-	-	-	-	36	0.7
Northern hog sucker	-	-	-	-	3	1	-	-	-	-	-	-	4	0.1
Shorthead redhorse	-	-	-	-	9	1	-	-	-	-	-	-	10	0.2
Rock bass	-	-	1	-	-	-	-	-	-	-	-	-	1	+
Redbreast sunfish	-	-	-	-	-	-	-	-	-	1	-	-	1	0.1
Pumpkinseed	-	-	1	-	-	-	-	-	-	-	-	-	1	+
Bluegill	TAKEN	TAKEN	-	-	-	-	-	-	-	-	3	-	3	0.1
Smallmouth bass	-	-	1	-	2	2	-	-	-	-	-	-	6	0.1
Teardrop darter	-	-	-	-	4	12	-	3	-	-	-	-	19	0.2
Banded darter	-	-	-	1	-	-	-	2	-	-	-	-	3	0.1
Shield darter	-	-	-	-	12	-	1	-	-	-	-	-	13	0.3
Wallers	-	-	-	-	1	-	-	-	-	-	-	-	1	+
No. of Specimens	-	-	3	43	421	414	462	357	475	550	1263	201	4891	
No. of Species	-	-	1	10	8	16	12	9	6	4	6	2	23	
No. of Hauls	-	-	8	8	71	8	10	11	11	10	10	10	101	
No./Haul	-	-	0.62	5.42	38.27	76.75	46.20	32.09	88.64	55.00	126.30	20.10	48.43	
Diversity Index	-	-	0.90	1.96	1.18	1.48	1.79	0.82	0.82	0.36	0.33	0.04	1.03	

+ Less than 0.05%.

Table 4.2-26

Summary of fishes taken at seine Station TM-AQF-16A7 in 1962.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Cizzard shad	-	-	-	-	-	-	1	-	-	-	-	-	1	+
Common carp	-	-	-	-	-	-	-	1	-	-	-	-	1	+
River chub	-	-	-	-	-	1	-	-	-	-	-	-	1	+
Golden shiner	-	-	-	-	18	2	3	4	1	-	-	-	28	0.6
Comely shiner	-	-	-	-	-	-	-	9	1	-	-	-	10	0.1
Common shiner	-	-	-	-	-	-	-	1	-	-	-	-	1	+
Spottail shiner	-	-	2	2	3	228	46	12	4	-	-	-	300	4.1
Swallowtail shiner	-	-	-	-	-	-	-	-	5	-	-	-	5	0.1
Koysface shiner	-	NO	-	1	1	-	-	-	-	-	-	-	2	+
Spottin shiner	8	-	3	13	1011	203	120	905	1208	574	58	1200	5383	74.3
Miami shiner	-	-	-	-	12	9	-	77	31	-	-	-	124	1.1
Bluntnose shiner	-	-	-	1	5	-	-	5	21	-	-	-	32	0.3
Creek chub	-	-	-	-	-	-	-	1	-	-	-	-	1	+
Fallfish	-	-	-	-	1	7	1	-	-	-	-	-	9	0.1
Oulliback	-	-	-	-	-	2	-	-	-	-	-	-	2	+
White sucker	-	-	-	-	-	163	14	21	1	-	-	-	24	0.3
Northern hog sucker	-	SAMPLED	-	-	-	25	1	-	-	-	-	-	26	0.4
Shorthead redhorse	-	-	-	-	-	32	-	-	-	-	-	-	32	0.4
Brown bullhead	-	-	-	-	-	-	-	3	-	-	-	-	3	+
Channel catfish	-	-	-	-	-	-	-	-	17	-	-	-	17	0.2
Rock bass	-	-	-	-	-	-	-	5	-	-	-	-	5	0.1
Redbreast sunfish	-	-	-	-	-	-	-	-	1	-	-	-	1	+
Pumpkinseed	-	-	-	-	1	-	-	-	303	226	61	17	608	6.4
Bluegill	-	TAKEN	-	-	-	-	-	43	14	13	1	-	71	1.0
Pumpkinseed/Bluegill	-	-	-	-	-	-	-	30	-	-	-	-	30	0.2
Smallmouth bass	-	-	-	-	-	9	2	-	1	-	-	-	12	0.2
Teardrop darter	-	-	-	-	-	33	10	7	2	4	1	-	57	0.9
Banded darter	-	-	-	-	-	-	-	1	-	-	-	-	1	+
Wallers	-	-	-	-	-	1	-	-	-	-	-	-	1	+
No. of Specimens	13	-	4	17	1033	715	198	1656	1751	244	77	1285	7246	
No. of Species	3	-	2	4	6	13	4	17	15	5	1	3	28	
No. of Hauls	4	-	6	9	10	9	10	10	11	10	3	9	98	
No./Haul	3.25	-	0.67	1.89	103.30	79.44	19.80	165.60	159.17	24.40	7.70	142.78	73.94	
Diversity Index	1.16	-	0.69	1.05	0.32	2.39	1.6	2.32	1.11	0.55	0.43	0.04	1.61	

+ Less than 0.05%.

Table 5. 2-27

Summary of fishes taken at seine Station TM-AOF-16A1 in 1982.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Common carp	-	-	-	-	-	-	-	-	-	-	-	-	1	4
River shad	-	-	-	1	-	-	-	-	-	-	-	-	1	4
Golden shiner	-	-	-	-	-	-	-	2	-	-	-	-	2	0.1
Longly shiner	-	-	-	-	-	1	2	3	-	-	-	-	6	0.2
Common shiner	-	-	-	-	-	-	1	1	-	-	-	-	2	0.1
Spottail shiner	2	-	-	4	-	84	18	3	10	-	2	-	123	3.4
Swallowtail shiner	1	NO	-	-	-	-	-	-	-	-	-	-	2	0.1
Spottin shiner	37	-	51	30	144	228	44	1241	211	1	17	11	2,446	66.6
Mimic shiner	1	-	3	1	5	-	-	47	2	-	2	-	61	1.7
Kiuninoo minnow	-	-	-	-	1	-	-	8	-	-	-	-	9	0.3
Fallfish	-	-	-	-	-	2	3	-	-	-	-	-	5	0.2
Quillback	-	-	-	-	-	-	1	-	-	-	-	-	1	4
White sucker	-	SAMPLES	-	-	2	99	-	-	-	-	-	-	101	2.9
Northern hog sucker	-	-	-	-	-	31	-	-	-	-	-	-	31	1.0
Shorthead redhorse	-	-	-	2	-	78	-	-	-	-	-	-	80	2.3
Rock bass	-	-	-	-	-	1	-	-	-	-	-	-	1	4
Redbreast sunfish	-	-	-	1	-	1	-	-	-	-	-	1	3	0.1
Pumpkinseed	-	-	-	-	-	4	1	1	-	1	-	-	7	0.2
Bluegill	-	TAKEN	-	-	-	-	-	13	16	1	-	-	30	0.9
Pumpkinseed/Bluegill	-	-	-	-	-	-	-	837	-	-	-	-	837	24.4
Smallmouth bass	-	-	-	3	-	-	1	-	2	-	-	-	6	0.2
Tessellated darter	5	-	2	2	-	7	3	1	-	3	-	-	23	0.7
Banded darter	-	-	-	-	-	1	-	-	-	-	-	-	1	4
Shield darter	-	-	-	-	-	1	-	-	-	-	-	-	1	4
Walleye	-	-	-	-	-	-	-	1	-	-	-	-	1	4
No. of Specimens	44	-	80	43	177	538	74	2208	241	6	21	12	3433	
No. of Species	3	-	3	4	4	13	10	11	5	4	3	2	24	
No. of Hauls	4	-	8	8	8	7	8	9	10	9	6	4	87	
No./Haul	11.00	-	7.50	5.62	22.12	76.86	9.88	245.33	24.10	0.67	3.52	1.50	39.46	
Diversity Index	0.99	-	0.48	1.76	0.32	1.28	1.85	1.32	0.72	1.54	0.85	0.37	1.86	

* Less than 0.05%.

Table 6. 2-28

Summary of fishes taken at seine Station TM-AOF-16A2 in 1982.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Gizzard shad	-	-	-	-	-	-	-	-	-	-	1	-	1	4
Golden shiner	-	-	-	-	-	-	-	2	-	-	1	-	3	4
Longly shiner	-	-	-	-	4	-	1	1	2	1	1	-	10	0.1
Common shiner	-	-	-	-	-	-	-	2	1	1	-	-	4	4
Spottail shiner	1	-	-	11	31	27	52	5	-	7	1	-	135	0.9
Swallowtail shiner	-	NO	1	1	6	-	-	10	8	25	3	-	62	0.4
Rockyface shiner	-	-	-	-	-	-	-	-	-	-	-	-	1	4
Spottin shiner	1	-	86	1	1335	3	55	1708	4855	1177	3736	317	13274	91.0
Mimic shiner	-	-	3	3	78	2	-	331	201	86	8	1	712	4.9
Notropis spp.	-	-	-	-	-	-	-	1	-	-	-	-	1	4
Kiuninoo minnow	-	-	-	-	11	2	-	53	2	20	1	-	93	0.6
Fallfish	-	-	-	-	-	3	6	-	-	-	-	-	9	0.1
Quillback	-	-	-	-	-	1	-	-	-	-	-	-	1	4
White sucker	-	SAMPLES	-	1	9	51	4	-	-	-	-	-	65	0.4
Northern hog sucker	-	-	-	-	-	6	-	-	-	-	-	-	6	4
Shorthead redhorse	-	-	-	-	-	29	-	-	-	-	-	-	29	0.2
Channel catfish	1	-	-	-	-	-	-	-	-	-	-	-	1	4
Redbreast sunfish	-	-	-	1	-	-	-	-	-	-	-	-	1	4
Pumpkinseed	-	-	-	-	1	3	-	-	-	2	3	-	9	0.1
Bluegill	-	-	-	-	-	-	-	-	-	3	2	-	5	4
Pumpkinseed/Bluegill	-	TAKEN	-	-	-	-	-	6	-	-	-	-	6	4
Smallmouth bass	-	-	-	1	-	3	1	4	4	-	-	-	13	0.1
White crappie	-	-	-	-	-	1	-	-	-	-	-	-	1	4
Black crappie	-	-	-	-	-	1	-	-	-	-	-	-	1	4
Tessellated darter	4	-	-	4	-	68	11	15	3	-	-	-	105	0.7
Banded darter	-	-	-	-	-	24	-	-	-	-	-	-	24	0.2
Shield darter	-	-	-	-	-	2	-	-	-	-	-	-	2	4
Walleye	-	-	-	-	-	1	-	-	-	-	-	-	1	4
No. of Specimens	7	-	95	23	1475	229	132	2148	5078	1320	3757	318	12540	
No. of Species	4	-	5	8	8	17	9	11	9	9	10	2	26	
No. of Hauls	4	-	8	9	8	8	8	8	5	8	8	8	82	
No./Haul	1.75	-	11.88	2.56	184.38	28.62	16.50	268.25	1015.60	165.00	469.62	39.75	177.80	
Diversity Index	1.45	-	0.60	2.16	0.63	2.85	1.39	1.01	0.29	0.69	0.85	0.63	0.66	

* Less than 0.05%.

Table 6.2-29

Summary of fishes taken at seine Station TM-AQF-986 in 1982.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Comely shiner	-	-	-	-	-	-	-	-	-	-	-	-	1	+
Common shiner	-	-	-	-	-	-	-	-	-	-	-	-	1	+
Spottail shiner	1	-	-	3	-	43	76	4	-	-	-	-	132	1.4
Swallowtail shiner	-	-	-	1	-	-	-	11	-	8	-	-	20	0.2
Spotfin shiner	2	NO	18	8	29	60	29	357	1889	3558	1896	548	8592	93.5
Mimic shiner	2	-	5	8	-	3	-	114	40	5	6	1	185	2.0
Bluntnose minnow	-	-	1	2	1	-	3	18	5	2	1	-	34	0.4
Fathead	-	-	-	-	-	1	9	-	-	-	-	-	10	0.1
Quillback	-	-	-	-	-	2	-	2	-	-	-	-	4	+
White sucker	-	SAMPLES	-	-	-	32	14	-	-	-	-	-	46	0.5
Northern hog sucker	-	-	-	-	-	1	-	-	-	-	-	-	1	+
Shorthead redhorse	-	-	-	-	-	33	-	-	-	-	-	-	33	0.4
Pumpkinseed	1	-	-	-	-	-	-	-	7	2	1	-	11	0.1
Bluegill	-	-	-	-	-	-	-	-	1	-	-	-	1	+
Pumpkinseed/Bluegill	-	TAKEN	-	-	-	-	-	29	-	-	-	-	29	0.3
Smallmouth bass	-	-	-	-	-	1	1	-	-	-	-	-	2	+
Tessellated darter	-	-	-	-	-	13	57	11	1	-	-	-	82	0.9
Shield darter	-	-	-	-	-	8	-	-	-	-	-	-	8	0.1
Walleye	-	-	-	-	-	3	-	-	-	-	-	-	3	+
No. of Specimens	4	-	25	22	34	200	189	507	1943	3875	1904	553	8798	
No. of Species	4	-	4	5	7	12	7	9	6	5	4	4	18	
No. of Hauls	4	-	8	8	8	8	8	8	7	8	8	8	83	
No./Haul	1.50	-	3.12	2.75	4.25	25.00	23.62	68.38	277.57	484.38	238.00	69.12	112.02	
Diversity Index	1.67	-	1.12	1.93	0.88	2.63	2.07	1.98	0.22	0.05	0.04	0.08	0.54	

+ Less than 0.05%.

Table 6.2-30

Summary of fishes taken at seine Station TM-AQF-9A1 in 1982.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Central stoneroller	-	-	-	-	-	-	-	-	1	-	-	-	1	0.1
Golden shiner	-	-	-	1	-	-	-	-	-	-	-	-	1	0.1
Comely shiner	-	-	5	-	2	1	-	-	-	-	-	-	9	0.5
Common shiner	-	-	-	-	-	1	-	-	-	-	-	-	1	0.1
Spottail shiner	-	-	1	9	3	65	91	1	9	-	-	-	180	8.4
Swallowtail shiner	-	-	1	1	-	-	-	-	-	-	-	-	2	0.1
Rosyface shiner	-	NO	2	-	-	-	-	-	-	-	-	-	2	0.1
Spotfin shiner	10	-	72	19	185	161	12	29	612	18	162	238	1494	77.8
Mimic shiner	-	-	9	7	9	2	-	2	5	-	3	-	37	1.9
Bluntnose minnow	-	-	1	5	5	1	-	-	3	-	-	-	15	0.8
Fathead	-	-	-	-	-	2	-	-	-	-	-	-	2	0.1
Quillback	-	-	-	-	-	1	-	-	-	-	-	-	1	0.1
White sucker	-	-	-	-	1	39	2	-	-	-	-	-	42	2.2
Northern hog sucker	-	SAMPLES	-	-	-	2	-	-	-	-	-	-	2	0.1
Shorthead redhorse	-	-	-	-	-	93	-	-	-	-	-	-	93	2.2
Brown bullhead	-	-	-	-	-	-	-	1	-	-	-	-	1	0.1
Channel catfish	-	-	-	-	-	-	1	-	-	-	-	-	1	0.1
Pumpkinseed	-	-	2	-	-	1	-	-	1	-	-	-	4	0.1
Bluegill	1	-	-	-	-	-	-	-	1	3	-	-	5	0.4
Pumpkinseed/Bluegill	-	-	-	-	-	-	-	10	-	-	-	-	10	0.5
Smallmouth bass	-	TAKEN	-	2	2	-	-	1	-	-	1	-	6	0.3
White crappie	-	-	-	1	-	-	-	-	-	-	-	-	1	0.1
Tessellated darter	-	-	-	2	1	19	9	5	11	1	5	1	54	2.8
Banded darter	-	-	-	-	-	1	-	-	-	-	-	-	1	0.1
Yellow perch	-	-	-	-	-	1	-	-	-	-	-	-	1	0.1
Shield darter	-	-	-	-	-	2	-	-	-	-	-	-	2	0.1
No. of Specimens	11	-	91	45	208	322	115	49	643	23	173	241	1921	
No. of Species	2	-	7	10	8	16	5	7	8	4	5	4	25	
No. of Hauls	4	-	8	8	8	8	8	8	8	8	9	8	85	
No./Haul	2.75	-	11.38	5.62	26.00	40.25	14.38	6.12	80.38	2.88	19.22	30.12	22.60	
Diversity Index	0.39	-	1.13	2.83	0.75	2.33	1.04	1.72	0.38	0.99	0.44	0.11	1.40	

+ Less than 0.05%.

Table 4-1-31

Summary of fishes taken at seine station TH-A01-983 in 1982.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Catch
Cizzard shad	-	-	-	-	-	-	-	-	-	-	-	-	1	*
Muskellunge	-	-	-	-	-	-	-	-	-	-	-	-	1	*
Central stoneroller	-	-	-	-	-	1	-	-	-	-	-	-	1	*
River shub	-	-	-	-	-	-	-	1	-	-	-	-	1	*
Common shiner	-	-	-	-	18	-	-	-	-	-	-	-	18	0.4
Spotail shiner	1	-	2	-	11	435	88	6	6	-	3	1	757	40.2
Shallowtail shiner	-	NO	-	1	2	1	-	-	-	-	-	-	4	0.1
Roxface shiner	-	-	-	-	1	-	-	-	-	-	-	-	1	*
Spotfin shiner	-	-	2	67	664	248	-	21	431	11	52	15	1544	41.2
Mimic shiner	-	-	-	2	2	-	-	-	15	-	-	-	20	1.0
Bluntnose minnow	-	-	5	2	-	1	1	3	2	-	-	-	15	0.4
Fallsnail	-	-	-	-	-	31	1	-	-	-	-	-	32	0.9
Quillback	-	-	-	-	-	-	-	1	-	-	-	-	1	*
White sucker	-	SAMPLED	-	-	-	209	6	-	-	-	-	-	215	1.7
Shorthead redhorse	-	-	-	-	-	15	-	-	-	-	-	-	15	0.4
Brown holbrock	-	-	-	-	-	-	262	-	-	-	1	-	263	7.0
Channel catfish	-	-	-	-	-	-	-	8	-	-	-	-	8	0.2
Pumpkinseed	1	-	2	-	-	2	-	-	6	2	-	-	15	0.3
Bluegill	-	-	2	-	-	-	-	-	-	-	-	-	2	0.1
Pumpkinseed/Bluegill	-	-	-	-	-	-	-	404	-	-	-	-	404	10.8
Smallmouth bass	-	TAKEN	-	-	-	1	-	-	-	-	-	-	1	0.2
Black crappie	-	-	-	-	-	-	2	-	-	-	-	-	2	0.1
Emoxia sp.	-	-	-	-	-	-	1	-	-	-	-	-	1	*
Tessellated darter	-	-	4	4	1	283	58	25	26	-	9	-	404	10.8
Yellow perch	-	-	1	-	-	-	-	-	-	-	-	-	1	*
Walleye	-	-	-	-	-	-	1	-	-	-	-	-	1	*
No. of Specimens	6	27	104	704	1434	420	475	485	13	58	18	3748		
No. of Species	3	6	8	7	7	12	9	10	6	2	4	25		
No. of Hauls	4	8	8	8	8	8	8	8	9	9	8	8	86	
No./Haul	1.50	3.38	13.00	88.00	179.25	52.50	59.38	61.12	1.44	6.44	2.25	43.58		
Diversity Index	1.08	2.28	1.53	0.47	2.08	1.49	0.93	0.71	0.58	0.57	0.83	2.52		

* Less than 0.05.

Table 4-1-32

Summary of fishes taken at seine station TH-A01-982 in 1982.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total	Catch
Central stoneroller	-	-	-	-	-	1	-	-	-	-	-	-	1	*
Shiny shiner	-	35	8	2	-	-	-	-	-	-	-	-	45	0.7
Spotail shiner	2	-	15	3	290	93	-	-	-	-	-	-	405	5.9
Shallowtail shiner	-	-	51	59	103	35	-	-	-	-	-	1	259	3.8
Roxface shiner	-	-	-	2	-	-	-	-	-	-	-	-	2	*
Spotfin shiner	-	NO	2232	714	631	301	49	11	37	-	12	60	4048	59.2
Mimic shiner	-	-	261	52	33	2	1	1	-	-	-	-	350	5.1
Bluntnose minnow	2	-	63	63	253	27	18	22	45	19	-	-	512	7.5
Facehead minnow	-	-	-	-	1	-	1	-	-	-	-	-	2	*
Creek shub	-	-	-	-	-	-	3	-	-	-	-	-	3	*
Fallsnail	-	-	-	-	-	13	10	-	-	-	-	-	23	0.3
Quillback	-	SAMPLED	-	-	-	1	-	-	-	-	-	-	1	*
White sucker	-	-	1	-	1	96	10	-	-	-	-	-	108	1.6
Rock bass	-	-	-	-	-	-	-	-	-	-	-	1	1	*
Redbreast sunfish	-	-	-	-	-	1	-	1	7	1	2	-	12	0.2
Pumpkinseed	2	-	2	8	4	1	1	20	50	143	4	15	250	3.7
Bluegill	1	TAKEN	-	-	-	-	-	13	129	219	3	102	467	6.8
Pumpkinseed/Bluegill	-	-	-	-	-	-	-	47	-	-	-	-	67	1.0
Smallmouth bass	-	-	-	-	-	48	3	6	-	-	-	-	57	0.8
Largemouth bass	-	-	-	-	-	2	1	2	-	-	-	-	5	0.1
White crappie	1	-	-	-	-	-	-	-	-	-	-	1	2	*
Tessellated darter	-	-	-	1	6	115	34	27	19	8	12	-	217	3.2
Walleye	-	-	-	-	-	2	-	-	-	-	-	-	2	*
No. of Specimens	8	2657	922	1037	635	374	166	267	267	390	33	180	6634	
No. of Species	5	8	9	10	15	12	10	6	5	5	6	22		
No. of Hauls	3	5	6	8	8	8	9	9	8	8	8	8	81	
No./Haul	2.67	531.40	153.67	129.62	116.88	24.89	18.44	35.88	43.33	41.12	22.50	84.43		
Diversity Index	2.00	0.89	1.28	1.55	2.48	2.35	2.57	2.14	1.34	1.93	1.40	1.30		

* Less than 0.05.

Table 6.2-33

Monthly summary of fishes taken by seine in 1982.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	% Catch
Gizzard shad	-	-	-	-	-	-	1	1	-	-	1	-	3	+
Muskellunge	-	-	-	-	-	-	-	-	-	-	-	1	1	+
Central stoneroller	-	-	-	-	1	2	-	-	1	-	-	-	4	+
Common carp	-	-	-	1	-	1	1	1	-	-	-	-	5	+
River chub	-	-	-	2	2	2	-	26	15	33	129	1	210	0.2
Golden shiner	20	51	23	4	32	4	1	11	6	1	1	5	205	0.2
Comely shiner	-	-	-	1	1	1	2	11	2	2	1	-	20	+
Common shiner	48	8	74	74	95	2523	998	82	40	7	10	4	3889	3.8
Spottail shiner	15	-	67	97	156	55	4	89	72	55	27	13	650	0.6
Rosyface shiner	-	80	3	4	5	-	-	-	1	-	-	-	13	+
Spotfin shiner	3368	5199	4852	433	8869	3533	1195	9869	17075	13152	11365	4667	83145	80.8
Misic shiner	306	850	433	433	618	68	12	1750	782	236	89	27	5171	5.0
Notropis spp.	-	-	-	-	401	65	41	236	149	58	11	-	1	+
Bluntnose minnow	27	-	79	149	401	65	1	236	149	58	11	-	1216	1.2
Fathead minnow	-	-	-	-	1	1	1	1	-	-	-	-	2	+
Blacknose dace	-	-	-	-	-	1	-	-	-	-	-	-	2	+
Longnose dace	-	-	-	-	-	1	-	-	-	-	-	-	1	+
Creek chub	-	-	-	-	-	1	3	1	-	-	1	-	6	+
Fallfish	-	-	-	-	1	76	56	8	2	-	2	-	145	0.1
Quillback	-	-	-	-	-	131	1	41	1	-	-	-	174	0.2
White sucker	-	-	1	1	15	1019	70	2	-	-	-	-	1108	1.1
Northern hog sucker	-	-	-	2	-	261	1	-	-	-	-	-	264	0.3
Shorthead redhorse	-	-	-	-	-	-	262	4	-	-	-	-	266	0.3
Brown bullhead	-	-	-	1	-	-	1	8	17	-	-	-	28	+
Channel catfish	1	-	-	1	1	1	-	1	-	1	3	-	9	+
Banded killifish	-	-	-	1	-	1	-	5	-	-	1	-	9	+
Rock bass	-	-	-	3	-	4	-	1	8	2	2	3	23	+
Redbreast sunfish	-	-	-	-	-	-	-	-	-	1	-	-	1	+
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	-	+
Pumpkinseed	4	3	17	17	6	12	4	197	598	569	1	16	1690	1.6
Bluegill	2	1	1	-	1	3	-	90	595	472	124	110	1314	1.3
Pumpkinseed/Bluegill	-	-	-	-	-	-	-	1862	66	-	-	-	1926	1.9
Smallmouth bass	-	-	-	7	2	94	14	14	8	-	1	-	140	0.1
Largemouth bass	-	-	-	-	-	3	1	2	-	-	-	-	6	+
White crappie	1	-	-	1	-	3	1	-	1	-	-	1	7	+
Black crappie	-	-	-	-	-	2	2	-	-	-	-	-	4	+
Pomoxis spp.	-	-	-	-	-	1	1	-	-	-	-	-	1	+
Tessellated darter	10	6	13	13	10	592	224	100	69	18	25	1	1068	1.0
Banded darter	-	-	-	-	1	28	-	3	-	1	-	-	33	+
Yellow perch	-	-	-	1	-	6	-	-	-	-	-	-	7	+
Shield darter	-	-	-	-	-	25	-	1	-	-	-	-	26	+
Walleye	-	-	-	-	-	17	4	1	-	-	-	-	22	+
No. of Specimens	3802	6268	5683	10237	8610	2933	14621	19417	14614	11857	4850	102892		
No. of Species	11	11	19	19	32	25	29	20	15	18	13	13	40	
No. of Hauls	37	75	78	82	79	89	90	82	86	86	86	87	871	
No./Haul	102.76	83.57	72.86	124.84	108.99	32.96	162.46	236.79	169.93	137.87	55.75	118.13		
Diversity Index	0.69	0.86	0.92	0.85	2.40	2.21	1.65	0.84	0.68	0.36	0.31	1.35		

+ Less than 0.001.

Table 6.2-34

Summary of fishes taken at seine stations in 1982. Station prefix TM-AOF- deleted from table.

Station	1985	1985	1985	1A2	1A1	1A2	986	9A1	9B3	4A2	Total	% Total
Cizzard shad	-	-	-	1	-	1	-	-	1	-	3	*
Muskellunge	-	-	-	-	-	-	-	-	1	-	1	*
Central stoneroller	-	1	-	-	-	-	-	1	1	1	4	*
Common carp	-	-	-	1	1	-	-	-	-	-	2	*
River chub	-	1	-	2	1	-	-	-	1	-	5	*
Golden shiner	23	185	2	10	2	7	-	1	-	-	210	0.2
Common shiner	39	19	29	31	6	10	1	9	16	45	25.5	0.2
Common shiner	10	1	-	1	2	4	1	1	-	-	20	*
Spottail shiner	427	1238	174	300	123	133	132	180	737	403	3889	3.8
Swallowtail shiner	191	34	88	8	2	61	20	2	4	259	650	0.6
Kowface shiner	2	-	2	3	-	1	-	2	1	2	13	*
Spottail shiner	27588	14928	4146	5383	2046	13274	8692	1494	1346	4048	83145	80.8
Mini shiner	2764	549	303	174	111	712	185	37	26	350	5171	5.0
Notropis spp.	-	-	-	-	-	1	-	-	-	-	1	*
Bluntnose minnow	360	122	28	23	9	93	34	15	15	512	1216	1.2
Fathead minnow	-	-	-	-	-	-	-	-	-	2	2	*
Blacknose dace	-	2	-	-	-	-	-	-	-	-	2	*
Long eye dace	-	-	1	-	-	-	-	-	-	-	1	*
Creeper chub	-	1	1	1	-	-	-	-	-	3	6	*
Fall fish	19	3	31	9	7	9	10	2	32	23	145	0.1
Quillback	50	91	-	24	1	1	4	1	1	1	174	0.2
White sucker	188	128	36	179	101	65	48	42	215	108	1108	1.1
Northern hog sucker	3	-	6	26	33	6	1	2	-	-	77	0.1
Shorthead redhorse	14	10	10	32	78	29	33	43	15	-	264	0.3
Brown d'head	-	-	-	3	-	-	-	1	262	-	266	0.3
Channel catfish	1	-	-	17	-	1	-	1	8	-	28	*
Banded killifish	1	6	-	-	-	-	-	-	-	-	7	*
Rock bass	-	1	1	5	1	-	-	-	-	1	9	*
Redbreast sunfish	2	1	3	1	3	1	-	-	-	12	23	*
Green sunfish	1	-	-	-	-	-	-	-	-	-	1	*
Pumpkinseed	670	714	1	608	7	9	11	7	13	250	1690	1.6
Bluegill	581	146	3	71	10	5	-	5	2	467	1314	1.3
Pumpkinseed/Bluegill	82	185	-	304	837	6	74	10	406	67	1926	1.9
Smallmouth bass	10	19	9	12	6	13	7	6	6	57	140	0.1
Largemouth bass	-	1	-	-	-	-	-	-	-	5	6	*
White crappie	1	2	-	-	-	1	-	1	-	2	7	*
Black crappie	-	1	-	-	-	1	-	-	2	-	4	*
Pomoxis spp.	-	-	-	-	-	-	-	-	1	-	1	*
Lesseledated darter	72	27	20	66	23	105	82	54	404	217	1068	1.0
Banded darter	-	-	3	2	1	26	-	1	-	-	33	*
Yellow perch	2	2	-	-	-	-	-	1	1	-	7	*
Shield darter	-	-	13	-	1	2	8	2	-	-	26	*
Walleye	-	7	1	1	1	2	3	-	1	2	22	*
No. of Specimens	33130	17806	4891	7246	3431	16580	9298	1621	3748	6839	102802	
No. of Species	25	28	27	28	24	26	18	25	25	22	40	
No. of Hauls	60	108	101	98	87	82	83	85	86	81	871	
No./Haul	52.17	164.87	48.43	73.94	39.46	177.80	112.02	22.60	43.58	84.43	118.13	
Diversity Index	1.07	1.09	1.03	1.61	1.86	0.66	0.54	1.40	1.52	2.30	1.35	

* Less than 0.05%.

Table 6.2-35

Monthly summary of fish biomass (g) at seine stations in 1982. Station prefix TM-AOF- deleted from table.

Station	1985	1985	1985	1A2	1A1	1A2	986	9A1	9B3	4A2	Total	
Jan	669.9	1.0	-	25.6	20.3	9.5	116.5	1.5	35.4	43.4	971.1	
Feb	NO SAMPLES TAKEN											
Mar	292.4	143.0	0.9	4.0	5.7	16.2	14.3	19.1	22.3	346.1	551.0	
Apr	581.0	190.3	286.2	24.3	167.0	227.0	23.0	358.2	161.4	344.2	2363.2	
May	522.3	798.8	185.4	441.5	43.0	427.5	22.1	95.8	176.3	522.1	3234.8	
Jun	590.5	843.7	305.2	236.9	591.2	391.4	66.2	144.0	270.7	420.0	3656.1	
Jul	109.7	192.9	336.8	112.6	77.2	45.8	47.9	24.7	32.1	103.6	983.3	
Aug	385.5	372.1	224.0	370.5	203.5	105.4	59.4	38.9	38.5	90.4	1938.2	
Sep	681.5	580.0	290.2	483.2	189.8	541.2	444.4	185.7	90.4	171.8	3659.0	
Oct	925.7	370.3	140.8	135.4	5.4	189.7	342.9	3.9	1.6	296.5	2112.7	
Nov	703.0	206.7	276.6	17.8	10.4	552.3	234.8	38.9	35.4	23.7	2099.6	
Dec	350.4	14.1	37.6	262.7	4.9	44.5	77.2	42.8	5.3	236.2	1083.6	
TOTAL	5820.2	3512.9	1943.7	2114.5	1318.4	2601.5	1449.0	953.5	668.6	2597.8	23220.1	

Table 4.2-26

Monthly summary of biomass (g) of fishes taken by seine in 1982.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Gizzard shad	-	-	-	-	-	-	0.8	-	-	0.8	-	-	1.6
Central stoneroller	-	-	-	1.3	0.3	-	-	1.2	-	-	-	-	2.8
Common carp	-	-	-	-	-	-	-	-	-	-	-	-	0.0
River chub	-	-	-	-	-	-	2.2	-	-	-	-	-	2.2
Golden shiner	-	-	0.6	-	1.1	-	0.4	0.8	-	-	-	-	2.9
Common shiner	8.2	-	8.8	5.7	11.2	0.7	5.1	4.6	2.1	0.7	0.1	1.5	83.2
Spot-tail shiner	-	-	-	0.9	0.1	-	1.5	0.9	1.1	0.4	-	-	4.4
Swallowtail shiner	210.0	-	31.8	287.5	318.4	133.9	191.2	61.4	59.2	22.3	27.4	10.9	1364.2
Rockface shiner	8.2	-	11.2	16.6	31.0	23.3	2.9	9.6	18.0	11.8	8.4	3.0	138.2
Spottail shiner	-	-	8.7	5.4	5.5	-	-	-	0.8	-	-	-	16.4
Mimic shiner	418.4	-	576.2	817.7	2062.7	1920.3	375.2	1289.4	2735.2	1753.6	1716.0	831.5	14698.2
Mimic shiner	93.3	-	191.6	16.5	191.3	34.7	4.0	147.7	120.5	35.7	15.9	4.5	915.5
<i>Nuttallia</i> spp.	-	-	-	-	-	-	-	0.1	-	-	-	-	0.1
Bluntnose minnow	11.1	-	27.1	85.2	425.2	103.1	35.8	52.2	45.2	25.7	5.7	-	846.9
Fathead minnow	-	-	-	-	1.0	-	0.9	-	-	-	-	-	1.9
Longnose dace	-	-	-	-	-	0.1	-	-	-	-	-	-	0.1
Creek chub	-	-	-	-	-	1.5	1.3	-	-	-	-	-	2.8
Fallfish	-	-	-	2.6	8.8	21.0	13.7	1.6	-	1.3	-	-	43.3
Quillback	-	-	-	-	4.5	-	18.9	1.5	-	-	-	-	23.6
White sucker	-	SAMPLES	0.3	1.6	3.2	83.2	43.3	6.1	-	-	-	-	136.1
Northern hog sucker	-	-	-	-	-	3.8	13.6	-	-	-	-	-	17.4
Shorthead redbreast	-	-	37.3	-	6.8	0.7	-	-	-	-	-	-	44.8
Brown bullhead	-	-	-	-	-	18.2	6.0	-	-	-	-	-	24.2
Channel catfish	0.9	-	1.6	-	-	0.2	18.2	36.6	-	-	-	-	57.5
Banded killifish	-	-	-	1.2	2.3	-	0.1	-	0.5	2.4	-	-	6.5
Rock bass	-	-	125.0	-	80.9	-	1.5	-	-	3.9	1.3	-	212.6
Redbreast sunfish	-	-	91.6	-	174.4	-	0.5	7.2	2.7	1.0	3.7	-	281.1
Green sunfish	-	-	-	-	-	-	-	1.0	-	-	-	-	1.0
Pumpkinseed	163.8	-	3.0	414.5	149.8	493.0	32.2	72.3	227.5	225.9	147.9	90.7	2040.4
Bluegill	0.6	TAKEN	2.7	-	0.7	223.9	-	29.4	203.2	302.0	42.3	126.2	951.0
Pumpkinseed/Bluegill	-	-	-	-	-	-	-	82.5	5.1	-	-	-	87.6
Smallmouth bass	-	-	216.8	17.9	40.6	16.3	34.7	43.1	-	7.9	-	-	294.8
Largemouth bass	-	-	-	-	0.6	0.4	8.6	-	-	-	-	-	9.6
White crappie	6.1	-	84.3	-	180.3	-	-	53.1	-	-	-	3.0	318.8
Black crappie	-	-	-	-	103.8	0.1	-	-	-	-	-	-	104.0
Tessellated darter	8.7	-	4.5	12.4	9.8	36.9	37.2	44.6	46.9	16.0	33.3	0.9	249.7
Banded darter	-	-	-	0.3	1.9	-	0.4	-	-	0.4	-	-	2.8
Yellow perch	-	-	19.7	-	0.6	-	-	-	-	-	-	-	20.3
Shield darter	-	-	-	-	2.4	-	-	0.7	-	-	-	-	3.1
Walleye	-	-	-	-	6.1	5.3	10.3	-	-	-	-	-	21.7
TOTAL	923.1	-	864.0	1363.2	3232.8	2619.7	940.3	1938.2	3659.0	2412.1	2099.6	1083.2	13220.1

Table 4.2-27

Summary of biomass (g) of fishes taken at seine stations in 1982. Station prefix TM-A01- deleted from table.

Station	186	188	1845	1A	1A1	10A	986	9A1	983	482	Total
Gizzard shad	-	-	-	-	-	0.8	-	-	0.8	-	1.6
Central stoneroller	-	1.3	-	-	-	-	-	1.2	0.2	0.1	2.8
Common carp	-	-	-	2.2	-	-	-	-	-	-	2.2
River chub	-	0.2	-	1.9	0.6	-	-	-	0.2	-	2.9
Golden shiner	6.1	64.2	2.7	0.9	0.2	0.6	-	44.4	-	-	119.3
Common shiner	8.1	3.4	6.1	6.4	0.8	1.3	0.4	3.1	4.7	8.7	83.2
Spot-tail shiner	3.1	-	-	0.1	0.1	0.9	0.1	0.1	-	-	4.4
Swallowtail shiner	351.7	120.1	71.6	97.0	69.4	292.5	69.9	80.3	138.2	73.3	1364.2
Rockface shiner	53.8	4.4	24.2	2.5	0.4	7.1	1.6	0.5	1.2	4.4	138.2
Spottail shiner	2.3	-	2.3	2.1	-	1.5	-	4.2	1.6	2.4	16.4
Mimic shiner	4196.1	2642.7	1475.3	1551.6	593.5	1433.6	1203.8	465.4	313.9	820.7	14698.2
Mimic shiner	170.3	37.6	70.9	30.5	9.3	90.2	21.7	8.3	5.0	11.7	915.5
<i>Nuttallia</i> spp.	-	-	-	-	-	-	-	-	-	-	0.1
Bluntnose minnow	134.0	85.4	13.9	19.3	1.2	24.4	4.7	9.3	7.1	524.5	846.9
Fathead minnow	-	-	-	-	-	-	-	-	-	-	1.9
Longnose dace	-	-	0.1	-	-	-	-	-	-	-	0.1
Creek chub	-	1.3	1.3	-	-	-	-	-	-	-	2.6
Fallfish	6.8	0.6	33.8	4.2	1.1	3.9	3.0	-	2.4	3.8	43.3
Quillback	3.8	13.4	-	6.1	-	-	-	-	-	-	23.6
White sucker	20.3	14.7	4.2	32.3	4.4	6.2	9.1	4.6	26.7	18.6	136.1
Northern hog sucker	0.1	-	19.2	2.0	1.5	0.4	0.1	0.1	-	-	17.4
Shorthead redbreast	0.3	0.4	0.9	0.9	39.2	0.8	0.7	0.9	0.5	-	44.8
Brown bullhead	-	-	-	3.4	-	-	-	0.6	14.2	-	22.2
Channel catfish	1.6	-	-	36.6	-	0.9	-	0.2	18.2	-	57.5
Banded killifish	1.2	3.3	-	-	-	-	-	-	-	-	4.5
Rock bass	-	3.9	125.0	1.3	80.9	-	-	-	-	1.3	212.6
Redbreast sunfish	3.0	6.3	31.3	0.7	89.3	46.9	-	-	-	103.4	281.1
Green sunfish	1.0	-	-	-	-	-	-	-	-	-	1.0
Pumpkinseed	202.9	77.6	27.7	217.0	262.7	297.7	113.1	190.0	336.8	414.9	2040.4
Bluegill	190.7	287.1	2.9	32.3	17.0	2.7	1.7	2.7	3.1	410.8	951.0
Pumpkinseed/Bluegill	6.2	8.8	-	27.3	28.8	0.3	1.0	0.3	11.8	3.1	87.6
Smallmouth bass	1.7	3.2	84.1	10.5	96.3	158.6	1.1	28.0	0.7	30.3	294.8
Largemouth bass	-	0.2	-	-	-	-	-	-	-	-	0.4
White crappie	13.4	103.8	-	-	-	100.2	-	84.3	-	9.1	318.8
Black crappie	-	0.1	-	-	-	103.8	-	-	0.1	-	104.0
Tessellated darter	13.8	8.9	7.1	22.0	11.0	23.7	34.2	24.3	38.6	85.8	249.7
Banded darter	-	-	0.7	0.6	-	1.4	-	0.1	-	-	2.8
Yellow perch	0.3	0.2	-	-	-	-	-	0.1	19.7	-	20.3
Shield darter	-	-	1.7	-	0.1	0.1	1.1	0.1	-	-	3.1
Walleye	3.8	0.9	0.5	0.4	10.3	1.7	1.3	-	0.7	0.3	21.7
TOTAL	5820.7	3512.9	1983.7	2115.5	1318.5	2601.3	1449.0	955.5	808.6	2397.8	13220.1

Table 6.2-33

Mean, minimum, and maximum percent frequencies of family composition at seine stations sampled 1974 through 1981 vs. 1982 frequencies. Berring, pike, and killifish families not included due to low numbers.

	TM-AQF-13B5			TM-AQF-10B5			TM-AQF-16A5			TM-AQF-1A7			TM-AQF-16A1							
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max					
Minnows	87.8	75.0	99.2	96.9	91.7	82.2	97.7	95.8	85.5	69.4	97.7	97.8	82.2	67.5	94.8	81.1	77.2	56.7	91.6	67.6
Suckers	9.2	0.1	22.7	0.8	3.4	0.2	7.5	1.3	7.3	1.5	16.9	1.0	6.8	0.8	15.6	3.6	13.9	2.1	36.2	6.2
Catfishes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.1	0.0
Sunfishes	1.7	0.4	3.6	4.0	3.4	1.9	6.2	2.5	3.5	0.3	10.5	0.4	7.2	0.9	17.6	13.9	5.6	1.9	9.6	25.8
Perches	1.3	0.1	3.1	0.2	1.4	0.1	4.1	0.2	3.6	0.3	7.7	0.8	3.8	1.4	10.2	0.9	3.3	0.6	7.8	0.7

Table 6.2-38 continued.

	TM-AQF-10A2			TM-AQF-9B6			TM-AQF-9A1			TM-AQF-9B2			TM-AQF-4A2							
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max					
Minnows	81.1	72.6	95.3	98.0	74.8	68.8	95.9	97.6	75.1	29.6	93.4	91.0	69.2	41.4	67.4	64.2	59.5	40.7	81.1	82.7
Suckers	12.4	3.2	19.9	0.6	11.5	2.6	31.7	0.9	11.0	0.6	40.4	4.6	15.4	2.1	36.1	6.1	8.7	0.4	15.6	1.6
Catfishes	0.5	0.0	3.8	0.0	3.5	0.1	11.2	0.0	0.6	0.0	4.0	0.2	4.0	0.0	15.2	7.2	0.0	0.0	0.1	0.0
Sunfishes	3.3	0.7	8.4	0.2	1.4	0.7	7.4	0.4	3.9	1.8	8.6	1.6	2.7	1.3	4.6	11.5	26.4	8.0	62.2	12.6
Perches	2.7	0.7	6.4	0.9	6.7	0.6	16.0	1.0	9.5	1.4	24.8	3.1	8.7	2.8	14.8	10.8	5.3	1.1	11.8	3.2

Table 6.2-39

Percent similarity indices of species composition between seine stations in 1982. Station prefix TM-AQF- deleted from table.

	13B5	10B5	16A5	1A2	16A1	10A2	9B6	9A1	9B3
10B5	91.4								
16A5	93.1	92.6							
1A2	82.2	84.5	82.2						
16A1	66.9	70.0	69.0	75.2					
10A2	91.0	89.6	93.0	79.0	65.8				
9B6	88.7	89.0	90.1	80.1	65.5	96.0			
9A1	54.0	90.1	86.5	86.3	72.4	83.1	86.0		
9B3	65.6	52.3	48.9	56.0	61.9	45.3	66.4	59.3	
4A2	72.3	72.6	72.3	74.3	71.5	67.5	65.1	74.4	55.2

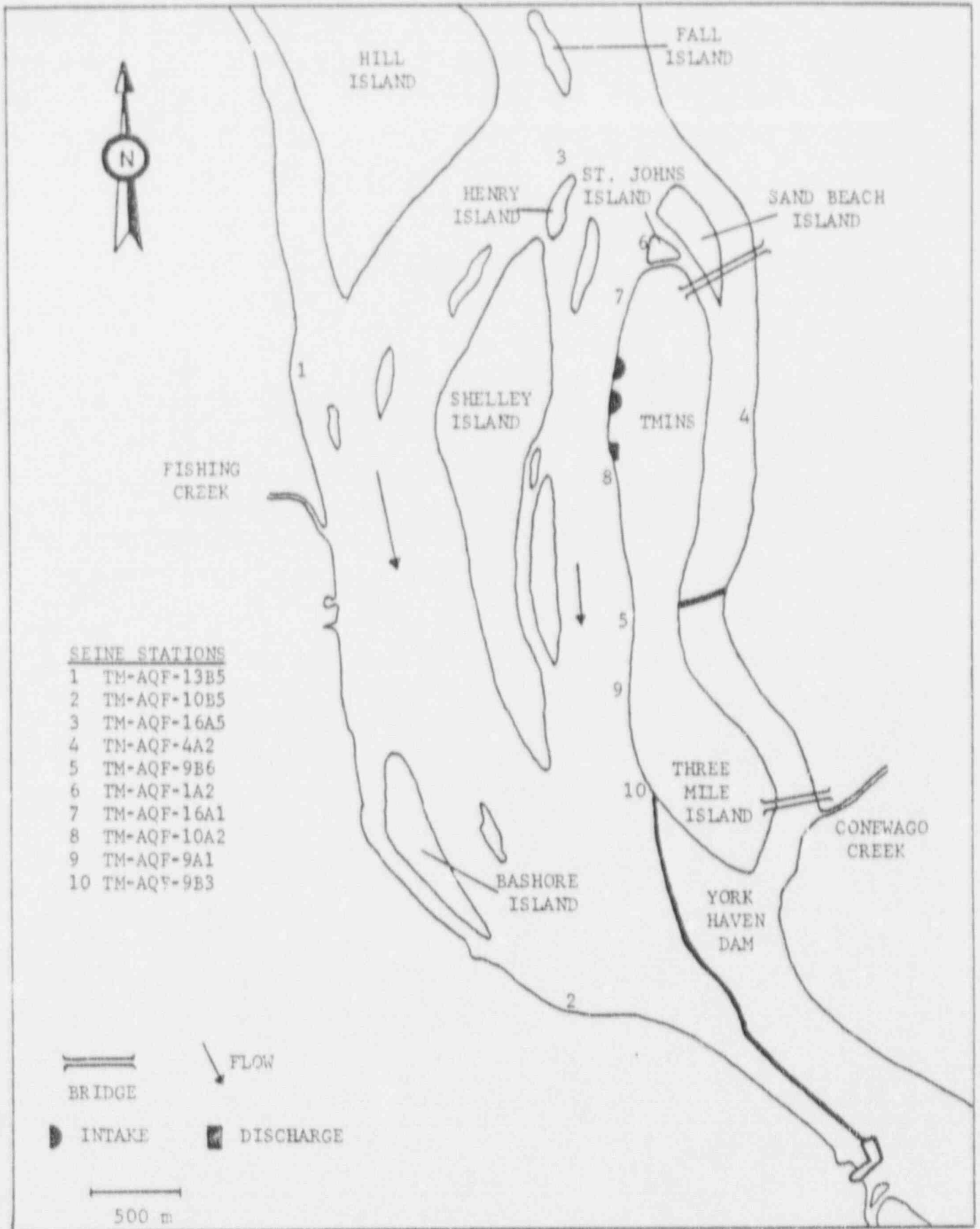


Figure 6.2-1. Location of seine stations sampled in York Haven Pond.

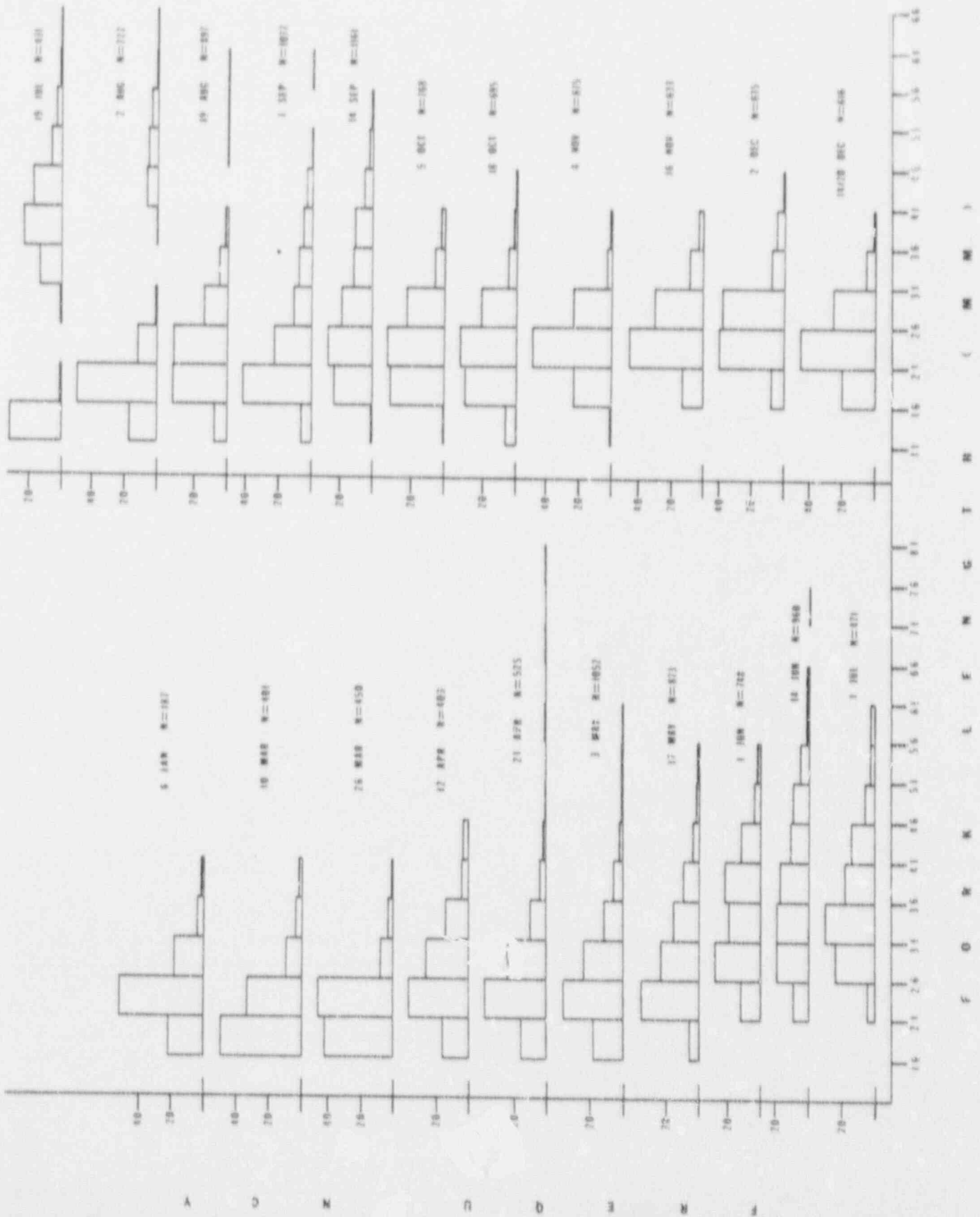


Figure 6.3-2. Frequency distributions for monthly collections of spotfin shiner taken by seine and gill net in 1962.

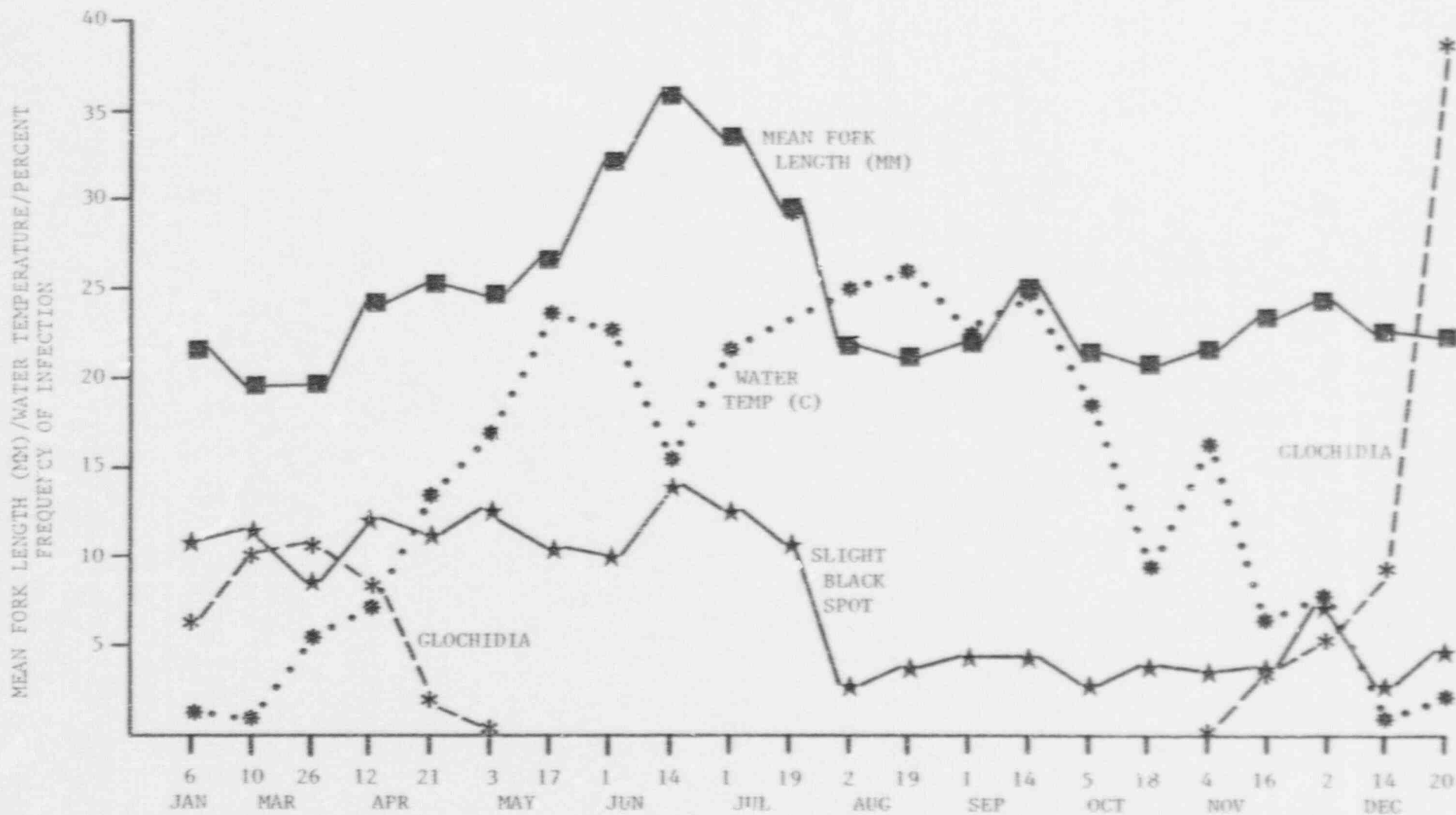


Figure 6.2-3. Relationship of mean fork length (■) and water temperature (●) to frequencies (%) of glochidia (*) and slight black spot (★) on spotfin shiner taken by seine in 1982.

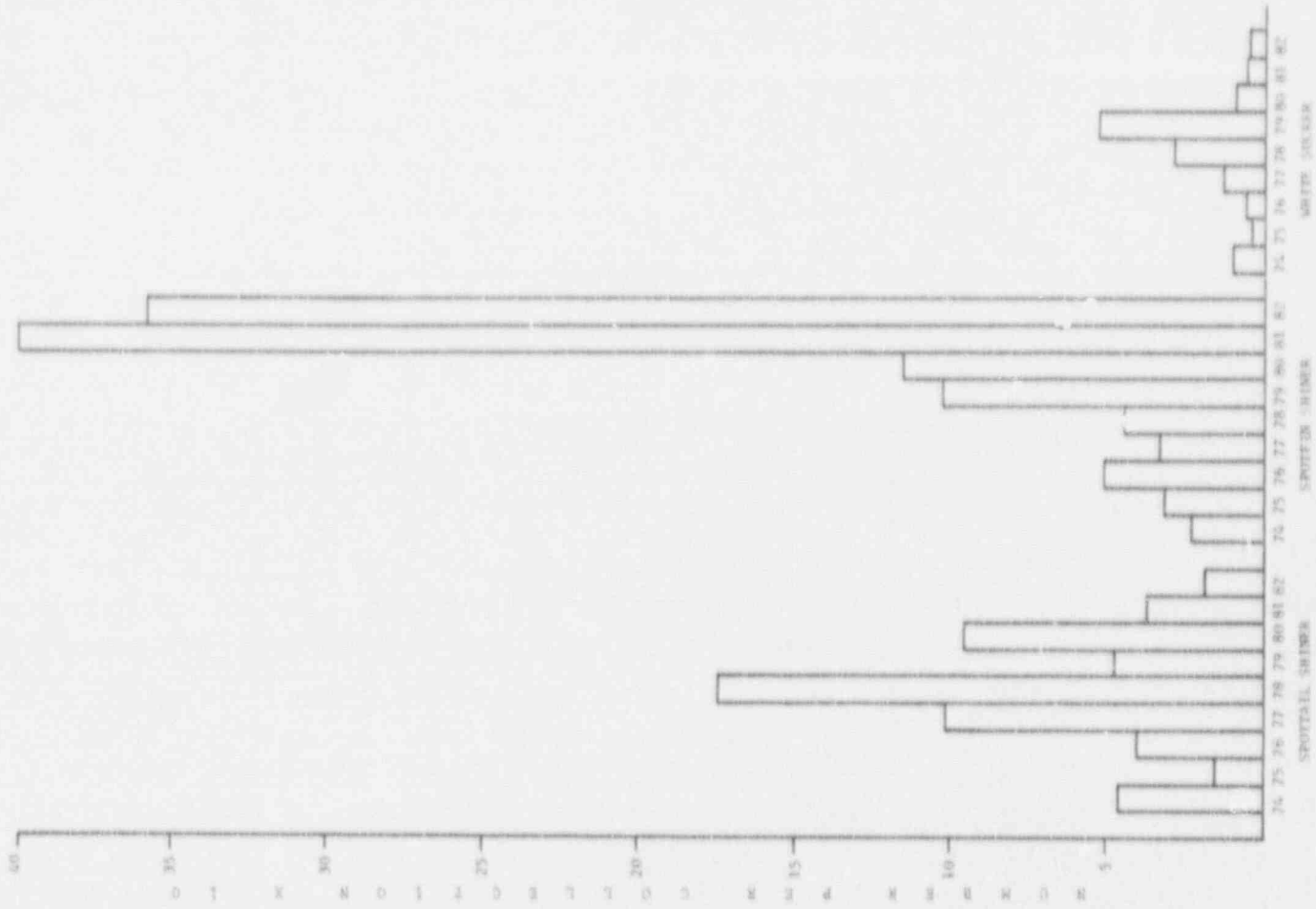


Figure 6.2-5. Yearly netow catches (number per collection) of spottail shiner, white shiner, and white sucker, 1974 through 1982.

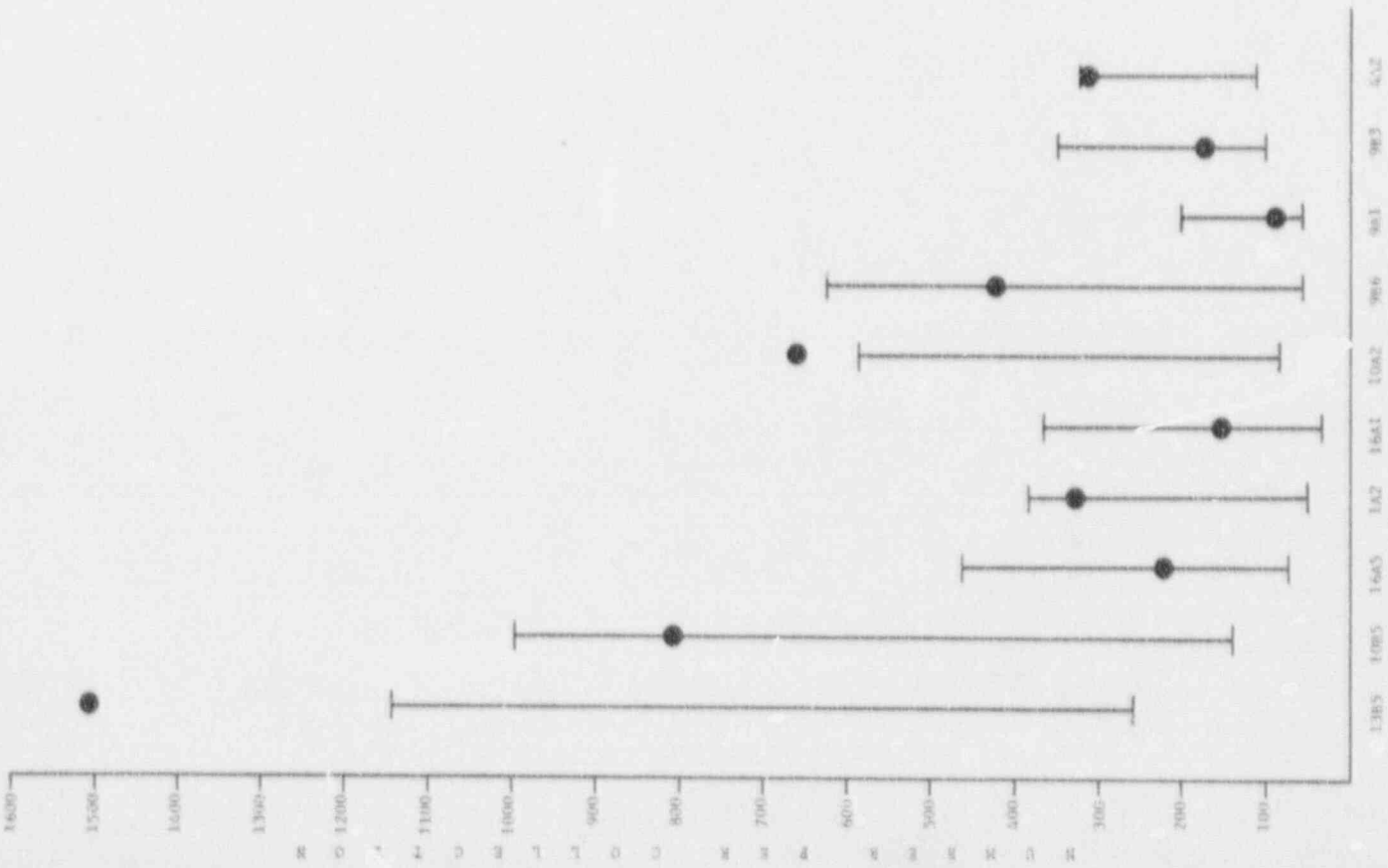


Figure 6.2-4. Range of yearly catches (number per collection) at seven stations 1976 through 1983 compared to 1985 catches. Sampling at 1385, 1665, 1841, 1983, and 1985 began in 1976.

Table 6.3-1

Location and description of AC electrofishing zones sampled in York Haven Pond in 1982.

Zone Number	Location and Description
TM-AQF-172*	Along west shore of York Haven Pond, riffles to 500 m downstream. Characterized by many large boulders, rubble, and gravel on the bottom; some emergent vegetation (water willow, <i>Justicia americana</i>) along shore. An eddy is present in the upper 100 m of the zone at low to moderate river flow.†
TM-AQF-16B8	Along east and west shores of Fall Island, riffles to south tip. Many large boulders, rubble, and gravel on the bottom; several fallen trees along the east shore; and swift current, except when river flow is low.
TM-AQF-4A1	Along east shore of TMI, north bridge to 500 m downstream. Mud bottom and a few fallen trees along the length of the zone. When the water ceases to flow over Red Hill Dam (<435 m ³ /s) the current reverses and flows north in the zone. Extensive plankton blooms were present during the summer months.
TM-AQF-15A1	Along west shore of Shelley Island, north tip to 500 m downstream. Many large boulders, rubble, and gravel on the bottom. Some patches of water willow were present at the north end of the zone; swift current, except when river flow is low.
TM-AQF-15A2	Along east shore of Shelley Island, north tip to 500 m downstream. Many fallen trees, a few boulders, and a mud bottom; swift current, except during low river flow.
TM-AQF-16A2	Along west shore of TMI, north tip to 500 m downstream. Characterized by many large boulders, rubble, and gravel on the bottom. Emergent vegetation (water willow) common along shore. Swift current, except when river flow is low.
TM-AQF-13A1	Along west shore of TMI, 500 m downstream from north tip to Discharge. Many boulders and rip rap above Unit 2 Intake, below Unit 2 Intake shallow, with a mud bottom, a few boulders, and some patches of water willow. Swift current, except when river flow is low.
TM-AQF-10A3	Along west shore of TMI, Discharge to 500 m downstream. The upper 200 m is shallow with a mud bottom and some patches of emergent vegetation (water willow). There is an eddy along shore due to the Discharge. The lower 300 m has some boulders, and fallen trees, with rubble and gravel on the bottom.
TM-AQF-9B5	Along west shore of TMI, 1500 to 2000 m upstream of Discharge. Shallow with a mud bottom, a few boulders, and fallen trees, there is usually an eddy in the lower 100 m downstream of Haven Dam.
TM-AQF-10B1	Along east shore of Shelley Island from a point opposite the south tip of Beech Island to 500 m downstream. There are shallow mud flats close to shore, and a few fallen trees; many floating docks are present during summer and early fall.
TM-AQF-10B3	Along west shore of Shelley Island, 500 m upstream to south tip. There are a few fallen trees and boulders, the bottom consists of mud and gravel. There are extensive beds of water weed (<i>Elodea</i> sp.) along the length of the zone with many floating docks present during the summer and fall months.
TM-AQF-11B1	Along west shore of York Haven Pond from a small unnamed creek 500 m below the mouth of Fishing Creek to 500 m downstream. Shallow, with a mud bottom and a few fallen trees. There are extensive beds of wild celery (<i>Vallisneria spiralis</i>) and curly pondweed (<i>Potamogeton crispus</i>) in summer and fall.

* Prefix TM-AQF- deleted from zone number for discussion in text.

† River flow was defined as low (<170 m³/s) or moderate (170 to 1,000 m³/s).

Table 6.3-2

Fishes captured by the AC electrofisher near IMINS in March 1982.

Zone	11B1	10B3	10B1	13A1	10A3	985	13B2	16B8	4A1	16A2	15A2	15A1
Date	10 Mar	10 Mar	10 Mar	10 Mar	10 Mar	10 Mar	23 Mar	23 Mar	23 Mar	23 Mar	23 Mar	23 Mar
Time	1839	1904	1933	2003	2026	2049	1842	1923	1948	2007	2031	2052
Duration (min)	16	14	12	17	13	13	13	12	#	13	12	10
Air Temp (C)	2.0	2.0	2.0	2.0	1.5	1.5	5.5	4.0	4.0	3.5	3.5	3.0
Water Temp (C)	3.0	2.5	2.0	2.5	2.0	2.0	6.0	5.5	5.0	5.0	5.0	5.0
Dissolved Oxygen (mg/l)	13.0	13.1	14.0	12.4	12.1	12.8	11.5	11.7	11.7	11.8	11.8	12.0
pH	8.0	8.3	8.4	8.4	8.5	8.5	9.5	9.4	9.4	9.2	9.3	9.2
Conductivity (micromhos/cm)	300	325	240	300	310	300	165	126	157	150	132	130
Secchi Disc (cm)	96*	122	127*	63	66	63	46	63	31	56	56	58
Volts	205	205	210	200	205	205	205	215	215	215	215	210
AMPS	2.0	2.0	4.0	3.0	2.0	2.0	2.5	2.0	2.0	2.0	2.0	2.0
Gizzard shad	1	-	-	-	-	-	-	-	-	-	-	-
Muskellunge	-	1	-	-	-	-	-	-	-	-	-	-
Common carp	-	-	-	-	-	-	3	-	-	-	2	-
Fallfish	-	-	-	NO	-	NO	-	-	NO	-	NO	NO
Quillback	-	-	-	-	-	-	14	1	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	1	1	-	FISH	-	FISH	2	-	FISH	1	FISH	FISH
Rock bass	-	-	4	-	-	-	7	-	-	-	-	-
Redbreast sunfish	-	-	2	-	-	-	-	-	-	-	-	-
Pumpkinseed	5	1	2	TAKEN	2	TAKEN	-	-	TAKEN	-	TAKEN	TAKEN
Bluegill	2	-	-	-	-	-	-	-	-	-	-	-
Smallmouth bass	-	-	1	-	-	-	3	3	-	1	-	-
Walleye	-	-	-	-	2	-	-	-	-	-	2	-
No. of Specimens	9	3	9	0	4	0	29	4	0	6	0	0
No. of Species	4	3	4	0	2	0	5	2	0	6	0	0

* Clear to bottom at indicated depth.

Table 6.3-2 continued.

Zone	13A1	10A3	985	10B1	10B3	11B1	15B2	16B8	4A1	16A2	15A2	15A1	Total
Date	30 Mar	30 Mar	30 Mar	30 Mar	30 Mar	30 Mar	31 Mar	31 Mar	31 Mar	31 Mar	31 Mar	31 Mar	
Time	1851	1913	1941	2005	2032	2101	1858	1941	2005	2030	2052	2113	
Duration (min)	16	14	13	16	19	16	13	14	14	12	12	12	
Air Temp (C)	14.5	12.0	9.5	8.0	11.0	7.0	12.5	12.0	10.0	14.0	9.0	10.0	
Water Temp (C)	5.5	5.5	5.5	6.0	6.0	7.0	8.5	7.5	6.5	7.3	7.0	7.0	
Dissolved Oxygen (mg/l)	12.0	11.8	11.8	11.8	11.6	11.4	11.8	12.1	12.1	12.1	12.0	12.0	
pH	8.3	8.7	8.6	8.6	8.6	8.6	8.5	8.6	8.5	8.4	8.4	8.4	
Conductivity (micromhos/cm)	136	131	132	112	110	170	181	110	162	142	116	114	
Secchi Disc (cm)	30	36	36	41	46	66	61	89	58	56	66	54	
Volts	215	220	220	220	210	205	205	210	220	220	210	210	
AMPS	2.0	2.0	2.0	2.0	1.0	2.5	4.0	1.0	2.0	2.0	1.0	1.0	
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-	1
Muskellunge	-	-	-	1	-	1	-	-	-	-	-	-	3
Common carp	-	-	3	1	4	2	1	3	-	-	2	-	21
Fallfish	2	1	-	-	-	-	1	-	NO	-	-	NO	4
Quillback	-	2	1	2	1	4	17	1	-	-	-	-	43
Shorthead redhorse	-	6	-	-	-	-	-	-	-	-	-	-	6
Channel catfish	-	-	-	-	-	-	-	1	FISH	-	-	FISH	6
Rock bass	1	-	-	-	-	-	17	1	-	-	-	-	30
Redbreast sunfish	-	-	-	-	-	-	1	1	-	-	-	-	3
Pumpkinseed	-	-	-	-	-	-	-	1	TAKEN	-	-	TAKEN	11
Bluegill	-	-	-	-	-	6	-	-	-	-	-	-	8
Smallmouth bass	1	-	-	-	-	-	1	-	-	1	-	-	11
Walleye	-	1	-	-	-	-	-	-	-	-	-	-	6
No. of Specimens	4	10	4	4	3	13	38	8	0	1	2	0	153
No. of Species	3	4	2	3	2	4	6	6	0	1	1	0	13

Table 6.3-1

Fishes captured by the AC electrofisher near TWINS in April 1982.

	1981	1984	4A1	16A2	15A2	15A1	15A1	10A3	9B5	10B1	10B3	11B1
Date	17 Apr	17 Apr	12 Apr	12 Apr	12 Apr	11 Apr	13 Apr	13 Apr	13 Apr	13 Apr	13 Apr	13 Apr
Time	1905	1954	2055	2120	2145	2205	1905	1917	1955	2017	2053	2114
Duration (min)	15	14	13	16	12	14	12	14	13	14	12	16
Air Temp (C)	7.5	7.0	8.0	6.0	6.5	6.0	15.0	15.0	14.0	12.7	12.0	10.0
Water Temp (C)	9.0	8.5	7.0	7.0	6.5	7.0	8.3	8.0	8.0	8.7	9.0	8.0
Dissolved Oxygen (mg/l)	11.6	11.7	11.6	11.7	11.6	11.6	11.3	11.2	11.2	11.2	11.0	10.9
pH	8.1	8.9	8.8	8.4	8.4	8.5	8.7	8.4	8.5	8.5	8.9	8.8
Conductivity (microhm/cm)	230	187	185	184	152	147	184	183	189	184	153	225
Secchi Disc (cm)	91	97	96	69	84	89	76	71	61	91	81	76
Volts	190	205	205	205	210	210	210	215	220	220	220	215
amps	3.0	2.0	4.0	3.5	2.0	2.0	3.0	3.5	2.5	2.5	2.0	5.0
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-
Brown trout	-	-	-	-	-	-	-	-	-	-	-	-
Common carp	2	3	-	1	-	1	-	-	1	2	-	4
Fallfish	-	1	-	4	-	1	-	-	-	-	-	-
Quillback	5	4	-	-	-	-	-	-	-	-	-	-
White sucker	-	1	1	1	NO	1	1	3	-	1	NO	33
Northern hog sucker	-	-	-	1	-	-	-	-	-	-	-	-
Shorthead redhorse	-	-	-	1	-	-	1	1	-	1	-	1
Channel catfish	8	2	-	1	-	1	-	-	-	-	-	-
Rock bass	34	19	-	-	FISH	-	3	1	-	1	FISH	-
Redbreast sunfish	-	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	2	-	-	-	-	-	1	-	-	-	-	1
Bluegill	-	-	-	-	-	-	-	-	-	-	-	-
Smallmouth bass	1	3	-	-	-	1	-	-	-	1	-	-
Largemouth bass	-	1	-	-	TAKEN	-	-	-	-	-	TAKEN	-
White crappie	-	-	-	-	-	-	-	1	-	-	-	-
Black crappie	1	-	-	-	-	-	-	-	-	-	-	-
Walleye	-	1	-	-	-	-	3	10	1	1	-	-
No. of Specimens	66	32	1	5	0	4	10	17	3	16	0	40
No. of Species	7	8	1	3	0	4	6	6	3	7	0	8

Table 6.3-1 continued.

Zone	15B2	16B8	4A1	16A2	15A2	15A1	15A1	10A3	9B5	10B1	10B3	11B1	Total
Date	21 Apr	21 Apr	21 Apr	21 Apr	21 Apr	21 Apr	22 Apr	22 Apr	22 Apr	22 Apr	22 Apr	22 Apr	
Time	1920	2008	2037	2054	2124	2152	1928	1944	2009	2033	2106	2131	
Duration (min)	15	12	13	16	11	11	9	11	12	13	9	17	
Air Temp (C)	11.0	11.0	10.0	10.0	10.0	10.0	9.0	10.0	10.0	10.0	11.0	6.0	
Water Temp (C)	13.5	13.0	13.0	13.0	13.0	13.0	12.0	12.0	12.0	12.0	13.0	13.0	
Dissolved Oxygen (mg/l)	10.2	10.0	9.8	9.8	9.8	9.8	10.7	9.7	9.8	9.5	9.6	6.7	
pH	8.6	8.6	8.5	8.4	8.5	8.5	8.5	8.5	8.5	8.4	8.5	8.5	
Conductivity (microhm/cm)	192	130	168	167	145	142	167	166	166	143	141	225	
Secchi Disc (cm)	71	36	28	30	30	30	36	36	41	38	41	86	
Volts	200	215	215	215	220	220	210	205	215	220	220	210	
amps	4.5	2.5	4.0	4.0	3.0	3.0	4.0	5.0	4.0	3.0	3.0	5.0	
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	1	3
Brown trout	-	-	-	-	-	-	-	-	-	-	-	1	1
Common carp	-	-	-	-	-	2	-	-	-	-	-	-	16
Fallfish	-	-	-	1	-	-	-	-	-	-	-	-	4
Quillback	3	-	1	1	-	-	1	-	2	6	2	1	69
White sucker	-	-	-	-	-	1	-	1	-	-	-	-	31
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	-	-	1
Shorthead redhorse	6	8	-	1	-	4	2	1	1	1	1	-	29
Channel catfish	-	-	-	-	-	-	-	-	-	-	-	-	2
Rock bass	27	10	-	-	-	-	2	-	1	-	-	2	40
Redbreast sunfish	6	1	-	1	-	-	-	-	-	-	-	2	10
Pumpkinseed	4	1	-	-	-	-	-	-	-	8	-	76	93
Bluegill	-	-	-	-	-	-	-	-	-	-	-	16	10
Smallmouth bass	8	2	-	5	-	-	-	1	-	2	1	-	25
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	1	2
White crappie	-	-	-	-	-	-	-	-	-	-	-	2	3
Black crappie	-	-	-	-	-	-	-	-	-	-	-	-	1
Walleye	8	2	-	-	1	-	-	1	-	2	-	4	31
No. of Specimens	59	24	1	9	1	7	5	4	2	21	4	100	453
No. of Species	8	6	1	5	1	3	3	4	3	5	3	10	18

Table 8.3-4

Fishes captured by the AC electrofisher near TMINF in May 1982.

Zone	1587	1588	4A1	16A2	15A2	13A1	11B1	10B3	10B1	13A1	10A3
Date	3 May	3 May	3 May	3 May	3 May	4 May	5 May	5 May	5 May	5 May	5 May
Time	2040	2131	2222	2256	2351	0012	2044	2120	2200	2240	2317
Duration (min)	20	16	16	14	9	14	16	18	17	20	17
Air Temp (C)	15.0	14.0	16.0	15.5	15.0	15.0	15.0	16.0	15.0	15.0	14.5
Water Temp (C)	18.0	18.0	18.0	18.0	17.0	17.0	18.0	19.0	19.0	19.0	19.0
Dissolved Oxygen (mg/l)	10.2	10.8	10.4	10.2	11.4	11.5	13.2	11.6	11.8	10.1	10.0
pH	8.5	8.5	8.5	8.4	8.6	8.6	8.8	8.4	8.3	8.9	8.6
Conductivity (micromhos/cm)	280	269	260	260	194	195	275	225	225	275	275
Secchi Disc (cm)	91	152	76	71	66	66	79	94	91	71	86
Volts	205	215	205	205	210	215	200	195	195	195	205
Amps	5.5	4.0	6.0	6.0	5.5	5.0	6.5	5.5	6.0	7.0	7.0
Cizzard shad	-	-	-	-	-	-	-	-	-	-	-
Common carp	-	2	4	-	-	1	-	1	-	-	-
Golden shiner	-	-	-	-	-	-	3	-	-	-	-
Fallfish	-	1	4	2	1	2	-	-	-	-	-
Quillback	7	1	3	-	-	-	1	8	1	2	3
White sucker	-	8	1	4	1	3	-	-	1	-	2
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	-
Shorthead redhorse	-	9	-	4	-	1	-	-	-	-	-
Yellow bullhead	-	-	-	-	-	-	1	-	-	-	-
Brown bullhead	-	-	2	-	-	-	-	1	-	-	-
Channel catfish	-	-	-	-	-	-	-	-	-	-	-
Rock bass	3	5	-	9	-	2	-	-	-	-	-
Redbreast sunfish	3	8	-	7	1	5	1	2	4	4	7
Green sunfish	2	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	10	1	7	19	-	-	-	-	-	-	-
Bluegill	3	1	2	2	-	1	24	37	33	7	21
Lepomis hybrid	-	-	-	-	-	-	-	-	-	-	-
Smallmouth bass	12	26	4	14	-	3	-	7	3	11	11
Largemouth bass	2	1	-	-	-	-	2	-	-	-	-
White crappie	1	1	-	-	-	-	12	1	-	-	-
Black crappie	-	-	-	-	-	-	2	2	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	-
Walleye	2	1	1	2	-	1	3	6	2	1	5
No. of Specimens	19	64	24	63	3	16	57	75	48	26	58
No. of Species	0	12	8	9	3	11	11	10	7	6	10

Table 8.3-4 continued.

Zone	11B1	10B3	10B1	13A1	10A3	9B5	15B2	16B8	4A1	16A2	15A2	13A1	Total
Date	17 May	17 May	17 May	17 May	17 May	17 May	25 May	25 May	25 May	25 May	25 May	26 May	
Time	2041	2111	2145	2215	2249	2328	2100	2151	2230	2258	2334	0007	
Duration (min)	15	18	15	17	15	13	18	15	15	17	16		
Air Temp (C)	21.0	20.0	20.0	21.0	20.0	20.0	18.0	17.0	16.0	16.5	16.5		16.0
Water Temp (C)	25.0	25.0	25.0	24.0	24.0	24.0	19.0	18.0	18.5	18.5	18.5		18.0
Dissolved Oxygen (mg/l)	13.4	10.9	10.4	13.0	5.8	9.4	8.1	8.4	8.8	9.2	10.0		10.6
pH	8.4	9.3	9.0	8.6	8.7	8.7	8.3	8.2	8.3	8.2	8.5		8.6
Conductivity (micromhos/cm)	275	240	250	325	325	340	310	188	350	340	240		225
Secchi Disc (cm)	63	97	91	81	91	91	51	86	54	58	63		79
Volts	190	200	200	190	190	185	190	200	185	180	185		190
Amps	6.5	6.5	7.0	7.5	7.5	7.5	6.5	4.0	7.0	7.0	5.0		5.0
Cizzard shad	-	-	-	-	-	-	-	-	-	-	-		1
Common carp	-	-	-	-	-	-	-	-	-	-	-		3
Golden shiner	1	-	-	-	-	-	-	-	-	-	3		4
Fallfish	-	-	-	-	-	-	-	1	-	-	-		4
Quillback	-	-	5	2	1	-	1	4	2	1	4		10
White sucker	-	-	-	1	2	3	-	1	-	1	4		16
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	-		32
Shorthead redhorse	-	-	-	-	1	-	-	-	-	-	-		1
Yellow bullhead	1	-	-	-	-	-	-	-	-	-	1		21
Brown bullhead	-	-	-	-	-	-	-	-	-	-	-		2
Channel catfish	-	-	-	3	-	-	-	-	-	-	-		3
Rock bass	-	-	2	5	10	3	-	3	-	-	4		10
Redbreast sunfish	1	1	-	7	10	2	31	11	-	2	14		141
Green sunfish	-	-	-	-	-	-	-	-	-	-	-		2
Pumpkinseed	6	5	1	6	15	10	33	1	8	10	2		17
Bluegill	3	6	-	-	6	13	5	2	-	-	5		65
Lepomis hybrid	-	-	-	-	-	-	1	-	-	-	-		1
Smallmouth bass	-	2	1	6	8	1	6	14	1	8	3		14
Largemouth bass	2	-	-	-	-	-	-	-	-	-	-		6
White crappie	-	-	-	-	-	1	-	-	-	-	-		16
Black crappie	-	-	-	-	-	-	-	2	-	-	-		8
Yellow perch	-	-	-	-	-	-	-	-	-	-	-		1
Walleye	-	2	1	4	4	1	-	-	-	-	-		1
No. of Specimens	14	16	10	34	37	34	81	43	11	32	43		477
No. of Species	4	5	5	8	9	8	6	10	3	7	11		55

Table 6.3-5

Fishes captured by the AC electrofisher near TMIHS in June 1982.

Time	1582	1688	16A1	16A2	15A2	15A1	11B1	10B3	10B1	13A1	10A3	9B3
Date	2 Jun	2 Jun	4 Jun	2 Jun	2 Jun	3 Jun	14 Jun	14 Jun	14 Jun	14 Jun	14 Jun	14 Jun
Time	2110	2149	2234	2304	2345	0007	2107	2131	2203	2230	2305	2342
Duration (min)	14	12	18	14	10	12	13	13	13	14	14	14
Air Temp (C)	17.5	17.5	17.5	18.1	15.5	15.2	15.0	16.0	16.0	16.0	16.0	15.0
Water Temp (C)	21.0	21.0	21.0	20.0	22.0	22.0	17.0	18.0	18.0	18.0	18.0	17.5
Dissolved Oxygen (mg/l)	7.1	8.3	8.2	8.3	8.5	8.7	9.3	9.6	9.8	9.8	9.6	9.4
pH	8.0	8.8	8.8	8.8	8.8	8.8	8.1	8.2	8.1	8.1	8.1	8.1
Conductivity (micromhos/cm)	275	148	240	250	154	154	225	137	140	191	190	190
Secchi Disc (cm)	23	63	18	25	61	61	25	61	46	26	18	20
Volts	185	195	190	190	200	195	200	205	210	210	205	210
Amps	6.0	3.0	6.0	6.0	4.0	6.0	5.0	3.0	4.0	3.0	3.0	3.0
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-
Common carp	-	-	-	-	-	-	-	-	-	-	-	-
Fallfish	-	-	-	-	-	-	-	-	-	-	-	-
Quillback	-	-	1	1	-	-	1	3	2	-	1	1
White sucker	-	2	-	1	1	-	-	-	-	-	2	-
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	5	-	4	3	1
Channel catfish	-	-	-	-	-	-	-	-	-	-	-	-
Margined madtom	-	-	-	-	-	-	-	-	-	-	-	-
Rock bass	3	6	-	1	-	3	-	-	-	-	-	-
Redbreast sunfish	-	16	-	2	-	2	-	-	-	-	-	-
Pumpkinseed	5	2	3	5	-	-	-	1	-	-	-	-
Bluegill	2	2	-	1	-	-	-	-	-	-	-	-
Smallmouth bass	10	22	2	18	1	10	2	12	-	13	11	1
Largemouth bass	-	1	-	-	-	-	-	-	-	-	-	-
White crappie	-	-	-	-	-	-	-	-	-	-	-	-
Black crappie	-	-	-	-	-	1	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	-	-
Walleye	-	1	-	4	1	4	-	-	-	-	1	-
No. of Specimens	20	52	7	31	4	22	4	21	7	23	22	8
No. of Species	4	8	4	8	4	7	3	4	1	5	6	6

Table 6.3-5 continued.

Time	15B2	16B8	16A1	16A2	15A2	15A1	11B1	10B3	10B1	13A1	10A3	9B3	Total
Date	17 Jun	17 Jun	17 Jun	17 Jun	17 Jun	17 Jun	21 Jun	21 Jun	23 Jun	21 Jun	21 Jun	22 Jun	
Time	2105	2155	2239	2256	2330	2359	2117	2149	2225	2301	2336	0019	
Duration (min)	13	11	11	14	15	16	14	15	14	14	16	16	
Air Temp (C)	20.0	20.5	21.0	21.0	20.0	20.0	19.0	20.0	19.0	20.0	19.5	18.5	
Water Temp (C)	20.0	20.5	20.5	20.5	20.5	20.5	21.0	21.5	21.0	21.0	21.0	21.0	
Dissolved Oxygen (mg/l)	7.9	8.5	9.0	8.9	9.1	8.9	8.1	8.3	8.2	7.8	7.7	7.6	
pH	8.5	8.6	8.6	8.4	8.5	8.3	8.4	8.6	8.5	8.3	8.3	8.1	
Conductivity (micromhos/cm)	230	151	225	225	154	153	250	172	172	225	225	225	
Secchi Disc (cm)	15	61	36	36	71	69	38	33	23	20	15	18	
Volts	200	200	195	195	200	205	200	200	205	205	205	205	
Amps	5.5	4.0	5.5	5.5	3.5	3.5	6.0	5.0	5.0	6.0	6.0	6.0	
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-	2
Common carp	-	-	4	1	-	-	1	2	-	1	2	1	21
Fallfish	-	-	-	-	2	-	-	-	-	-	-	-	3
Quillback	-	-	7	9	1	-	-	2	0	-	2	2	37
White sucker	-	7	-	9	1	1	-	-	-	1	3	-	32
Northern hog sucker	-	-	-	-	-	1	-	-	-	-	-	-	1
Shorthead redhorse	-	-	-	4	1	8	-	-	-	8	5	-	29
Channel catfish	-	1	-	-	-	-	-	-	-	-	-	-	1
Margined madtom	-	-	-	-	-	-	-	-	-	-	-	-	1
Rock bass	12	8	-	2	2	9	-	1	-	-	-	3	50
Redbreast sunfish	8	3	-	-	5	7	-	3	-	1	-	-	47
Pumpkinseed	15	-	-	1	-	-	10	11	6	2	5	3	69
Bluegill	-	-	-	-	-	-	1	4	-	-	-	-	17
Smallmouth bass	10	10	2	12	3	10	1	25	-	21	19	18	231
Largemouth bass	-	-	-	-	-	-	3	1	-	-	-	-	0
White crappie	-	-	-	-	-	-	1	-	-	-	-	-	1
Black crappie	-	-	-	-	-	1	-	-	-	-	1	-	3
Yellow perch	1	1	-	-	-	-	-	-	-	-	-	-	2
Walleye	-	-	-	2	1	1	-	1	-	-	3	3	22
No. of Specimens	46	30	8	40	16	38	18	50	15	34	40	27	378
No. of Species	5	6	3	8	8	8	6	6	2	6	8	6	19

Table 6.3a

Fishes captured by the AC electrofisher near TMINS in July 1982.

Zone	1582	1688	441	16A2	15A2	15A1	1381	10A3	1181	1083	1081	985
Date	7 Jul	7 Jul	7 Jul	7 Jul	8 Jul	8 Jul	13 Jul	13 Jul	14 Jul	14 Jul	16 Jul	14 Jul
Time	2125	2112	2259	2331	0010	0040	2251	2328	2057	2130	2207	2355
Duration (min)	17	14	17	19	17	17	18	18	18	18	18	20
Air Temp (C)	25.0	25.0	25.0	24.5	25.5	26.0	23.5	24.0	23.0	26.0	25.5	24.5
Water Temp (C)	25.3	25.3	26.0	25.5	25.5	25.5	27.5	28.0	27.5	28.5	28.5	28.0
Dissolved Oxygen (mg/l)	10.2	9.9	10.0	10.0	10.1	10.0	NA	NA	14.8	11.0	11.0	10.8
pH	8.6	8.8	8.4	8.3	8.6	8.6	9.7	9.2	9.1	9.2	9.3	8.5
Conductivity (micromhos/cm)	300	175	275	275	181	178	375	360	300	250	260	330
Secchi Disc (cm)	86	112	46	41	46	51	63	58	51	58	61	69
Volts	185	195	180	175	180	185	165	170	185	185	160	165
Amps	6.5	4.5	6.5	6.5	5.0	5.0	7.0	7.5	6.5	7.0	6.5	7.5
Cizzard shad	-	-	2	-	-	-	-	-	-	-	-	-
Common carp	-	1	-	-	-	-	-	-	-	-	-	-
Fallfish	-	-	-	-	-	-	1	-	-	-	-	-
Quillback	7	3	2	1	2	-	3	1	1	4	9	2
White sucker	-	8	-	1	-	2	3	1	-	-	-	-
Shorthead redhorse	-	1	-	4	-	2	-	-	-	-	-	-
Channel catfish	-	1	-	-	-	-	-	-	-	-	-	-
Rock bass	1	13	-	5	-	3	4	3	-	-	1	3
Redbreast sunfish	2	39	-	4	5	19	7	10	-	-	3	5
Green sunfish	1	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	18	-	5	9	1	1	11	9	2	6	5	11
Bluegill	1	-	-	7	-	1	-	1	1	20	2	3
Smallmouth bass	6	13	2	9	2	4	9	4	-	-	1	3
Largemouth bass	2	-	-	-	-	-	-	-	1	2	-	-
White crappie	-	-	1	-	-	-	1	-	-	-	-	1
Black crappie	-	-	-	1	-	-	-	1	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	-	-
Walleye	1	1	-	1	-	-	1	-	-	-	-	-
No. of Specimens	60	78	12	16	10	32	40	31	5	32	23	8
No. of Species	9	9	5	10	4	7	9	9	4	4	6	7

Table 6.3-b continued.

Zone	441	1582	1688	16A2	15A1	15A2	15A1	1181	1083	1081	10A3	985	Total
Date	19 Jul	21 Jul	21 Jul	21 Jul	21 Jul	21 Jul	22 Jul	22 Jul	22 Jul	22 Jul	22 Jul	23 Jul	
Time	2117	2104	2151	2230	2304	2344	0015	2122	2151	2221	2251	0000	
Duration (min)	14	18	15	18	18	18	13	15	15	14	16	16	
Air Temp (C)	27.5	22.0	27.5	20.5	20.0	19.5	18.0	25.0	26.0	26.0	24.0	21.0	
Water Temp (C)	30.5	27.5	27.5	27.7	27.0	27.5	27.0	28.0	30.0	29.0	27.0	27.0	
Dissolved Oxygen (mg/l)	10.8	13.6	11.8	10.2	10.0	10.2	10.0	15.4	10.2	10.6	10.0	9.7	
pH	8.9	9.0	9.2	8.1	8.2	9.0	8.7	8.9	8.7	8.9	8.5	8.4	
Conductivity (micromhos/cm)	400	325	250	400	400	290	275	290	290	300	390	390	
Secchi Disc (cm)	61	38	58	51	46	66	63	38	69	56	36	41	
Volts	175	185	195	165	175	175	175	170	170	170	170	170	
Amps	9.0	7.0	4.5	7.0	7.0	6.0	5.0	6.0	4.5	5.5	7.0	7.0	
Cizzard shad	-	2	-	-	-	-	-	-	-	-	-	1	3
Common carp	-	1	1	-	-	-	1	2	5	-	-	-	11
Fallfish	-	-	-	-	-	-	1	-	-	-	-	-	2
Quillback	-	12	2	10	1	1	4	13	4	7	3	16	110
White sucker	-	-	-	-	-	-	-	-	-	-	-	-	13
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-	7
Channel catfish	-	-	-	-	-	-	-	-	-	-	1	-	2
Rock bass	-	2	1	1	6	-	3	-	-	-	6	-	54
Redbreast sunfish	3	2	6	2	8	9	13	-	-	-	10	-	168
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1
Pumpkinseed	12	13	2	5	6	6	1	1	1	2	7	-	132
Bluegill	-	3	1	1	2	1	-	1	4	-	6	1	50
Smallmouth bass	2	1	6	3	2	4	9	-	-	-	2	2	84
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	-	5
White crappie	-	-	-	1	1	-	-	-	-	-	-	-	5
Black crappie	-	-	-	-	1	-	-	-	-	-	-	-	3
Yellow perch	-	3	-	-	-	-	-	-	-	-	-	-	3
Walleye	-	-	1	-	1	-	-	-	-	-	1	-	8
No. of Specimens	17	39	20	23	9	21	32	17	14	4	16	20	663
No. of Species	3	9	8	7	9	5	7	4	4	2	8	4	18

Table 1.3-7

Fishes captured by the AC electrofisher near TMIN3 4- August 1952.

	1582	1688	181	1632	15A1	1502	1301	10A3	981	1081	1083	1181
Date	9 Aug	9 Aug	9 Aug	9 Aug	12 Aug	12 Aug	12 Aug	12 Aug	12 Aug	12 Aug	12 Aug	13 Aug
Time	2052	2136	2215	2250	2036	2111	2227	2202	2224	2204	2332	0008
Duration (min)	17	14	18	14	14	14	17	17	17	16	19	17
Air Temp (C)	21.0	21.0	21.5	21.0	20.5	19.5	19.5	19.0	17.5	17.0	18.0	16.5
Water Temp (C)	28.0	26.5	25.0	25.0	24.0	24.0	23.5	22.5	22.5	24.0	24.0	23.5
Dissolved Oxygen (mg/l)	10.8	10.4	8.0	7.8	12.0	11.9	7.8	7.4	8.5	11.8	11.8	8.2
pH	8.9	9.0	8.8	8.5	9.1	8.6	8.1	7.8	7.7	8.8	8.0	8.4
Conductivity (micromhos/cm)	340	325	440	340	350	340	240	240	240	275	340	330
Secchi Disc (cm)	35	61	25	5	61	34	33	30	38	61	38	63
Volts	175	185	170	190	195	190	200	200	195	190	190	195
Amperes	6.5	7.0	7.0	5.0	7.0	7.3	3.2	3.5	3.3	3.0	3.0	7.0
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-
Common carp	-	-	2	1	-	-	-	-	-	1	1	-
Quillback	11	3	8	1	5	7	4	4	8	2	2	5
White sucker	-	-	-	-	-	-	-	-	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	-	-	-	-	1	-	1	-	-	-	-	1
Rock bass	-	-	3	3	2	-	1	-	1	-	-	-
Redbreast sunfish	1	4	-	2	18	1	4	4	-	1	1	1
Green sunfish	1	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	3	5	4	8	5	2	2	2	3	3	5	1
Bluegill	2	1	2	-	-	1	-	-	5	2	5	2
<i>Lepomis</i> hybrid	-	-	-	-	-	-	-	-	-	-	-	-
Smallmouth bass	1	5	4	10	5	2	-	2	4	-	2	-
Largemouth bass	1	-	-	-	-	-	-	-	-	-	-	1
Black crappie	-	3	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	-	1
Walleye	-	-	4	-	-	-	1	3	2	-	-	1
No. of Specimens	23	21	23	27	37	15	15	15	25	9	18	21
No. of Species	8	6	7	6	7	5	8	5	6	5	7	6

Table 1.3-7 continued.

	1582	1688	15A1	15A1	1083	1181	4A1	1662	13A1	10A3	985	1081	Total
Date	23 Aug	23 Aug	23 Aug	23 Aug	23 Aug	24 Aug	25 Aug	25 Aug	25 Aug	25 Aug	25 Aug	25 Aug	
Time	2030	2119	2206	2242	2326	0002	2029	2102	2130	2214	2205	2325	
Duration (min)	18	16	16	14	18	19	18	14	17	17	17	15	
Air Temp (C)	21.5	21.0	20.0	20.0	20.0	18.0	22.5	22.5	22.0	20.5	20.5	19.0	
Water Temp (C)	24.0	23.5	23.0	23.0	22.0	21.5	23.5	23.5	23.5	23.0	23.5	23.5	
Dissolved Oxygen (mg/l)	17.4	10.8	12.8	10.5	10.4	10.7	11.4	11.0	10.5	10.6	9.4	9.3	
pH	8.0	9.1	9.3	9.1	9.0	8.9	8.8	8.8	8.9	8.4	8.6	9.0	
Conductivity (micromhos/cm)	275	290	350	329	310	310	360	360	380	400	410	340	
Secchi Disc (cm)	63	69	61	51	46	28	53	33	33	28	41	61	
Volts	190	200	185	195	190	190	185	175	175	185	165	175	
Amperes	6.0	5.0	6.5	6.5	8.0	6.0	7.5	8.0	7.0	7.5	7.5	7.5	
Gizzard shad	14	-	-	-	-	-	-	-	-	-	-	-	15
Common carp	1	2	1	1	3	3	-	-	1	1	1	-	22
Quillback	11	7	8	5	2	2	1	1	2	1	5	1	102
White sucker	-	-	-	-	-	-	-	1	-	-	-	-	2
Shorthead redhorse	-	2	-	-	-	-	-	-	-	-	-	-	2
Channel catfish	-	1	-	1	-	-	-	-	1	-	-	-	4
Rock bass	2	4	-	8	1	1	1	4	6	3	-	-	40
Redbreast sunfish	-	3	3	22	-	-	1	2	12	9	-	-	90
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1
Pumpkinseed	4	8	9	1	4	1	10	2	4	16	2	1	107
Bluegill	-	7	1	5	1	-	-	1	2	3	2	3	47
<i>Lepomis</i> hybrid	-	1	-	-	-	-	-	-	-	-	-	-	2
Smallmouth bass	9	12	2	2	2	-	-	2	4	1	-	1	70
Largemouth bass	1	-	-	-	-	2	-	-	-	-	-	-	5
Black crappie	-	-	-	-	-	1	-	-	-	-	-	1	5
Yellow perch	2	-	-	-	-	-	-	-	-	-	-	-	3
Walleye	3	1	-	1	-	2	-	8	-	4	-	1	25
No. of Specimens	46	48	25	42	17	11	13	17	32	38	11	7	344
No. of Species	9	10	6	9	6	8	5	8	8	8	5	5	16

Table 8.3-8

Fishes captured by the AC electrofisher near TMIN5 in September 1982.

Zone	1081	1083	1081	13A1	10A3	985	1582	1688	4A1	16A2	15A2	15A1
Date	8 Sep	8 Sep	8 Sep	8 Sep	8 Sep	8 Sep	8 Sep	9 Sep	9 Sep	9 Sep	9 Sep	9 Sep
Time	2008	2041	2123	2200	2247	2322	1944	2036	2119	2200	2237	2314
Duration (min)	18	19	22	22	18	20	19	16	16	16	18	18
Air Temp (C)	17.5	18.5	17.5	17.5	17.5	16.5	18.0	18.5	18.5	17.0	17.0	17.0
Water Temp (C)	20.0	20.0	20.0	19.5	20.0	20.0	22.0	21.0	21.5	20.0	21.5	20.0
Dissolved Oxygen (mg/l)	8.9	9.7	10.2	9.0	8.5	9.2	12.1	11.0	11.1	10.6	11.6	11.2
pH	8.5	8.6	8.7	8.0	8.0	7.9	8.8	8.9	8.8	8.5	8.6	8.9
Conductivity (micromhos/cm)	325	375	400	425	440	450	310	325	410	425	390	390
Secchi Disc (cm)	61	71	61	66	66	51	66	91	46	61	63	63
Volts	190	175	180	175	160	165	200	200	195	180	190	180
Apps	6.5	7.5	8.0	7.0	7.5	8.0	6.5	5.0	8.0	9.0	7.0	8.5
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-
Muskellunge	-	-	-	-	-	-	1	-	-	-	-	-
Common carp	1	4	1	-	1	1	-	4	-	1	-	-
Quillback	2	2	6	3	2	9	10	10	3	9	14	1
White sucker	-	-	-	-	-	-	-	-	-	1	-	1
Northern hog sucker	-	-	-	2	-	-	-	-	-	-	-	-
Shorthead redhorse	-	-	-	1	-	-	-	3	-	-	-	-
Yellow bullhead	-	-	-	-	-	-	-	1	-	-	-	-
Channel catfish	-	-	-	1	-	-	-	3	-	-	1	-
Rock bass	-	-	-	1	1	-	5	5	6	1	3	8
Redbreast sunfish	-	-	4	3	11	1	4	3	7	4	10	4
Pumpkinseed	5	15	9	6	11	2	10	3	17	6	20	-
Bluegill	2	4	2	-	-	1	-	1	5	-	-	-
Smallmouth bass	-	2	1	5	-	1	4	12	6	6	1	9
Largemouth bass	2	1	-	-	-	-	1	-	1	-	-	-
White crappie	1	-	-	-	-	-	1	1	-	-	-	-
Black crappie	-	-	-	-	-	-	-	2	-	-	-	-
Yellow perch	-	-	1	-	-	-	3	-	-	-	-	-
Walleye	-	-	3	6	2	4	1	3	0	4	4	2
No. of Specimens	16	28	37	28	28	19	40	31	53	32	53	23
No. of Species	7	6	8	9	6	7	10	13	8	8	7	6

Table 8.3-8 continued.

Zone	1181	1083	1081	13A1	10A3	985	1582	1688	4A1	16A2	15A2	15A1	Total
Date	21 Sep	21 Sep	21 Sep	21 Sep	21 Sep	21 Sep	23 Sep	27 Sep	23 Sep	23 Sep	23 Sep	23 Sep	
Time	1933	2008	2048	2131	2206	2238	1940	1734	2113	2145	2226	2303	
Duration (min)	20	19	18	18	15	19	12	16	15	19	17	18	
Air Temp (C)	17.5	17.0	17.5	17.0	16.5	15.5	14.5	13.0	12.5	12.0	12.0	11.0	
Water Temp (C)	19.0	18.5	18.5	19.0	18.5	18.0	18.0	16.5	17.0	16.5	16.5	16.0	
Dissolved Oxygen (mg/l)	9.7	10.4	11.2	9.6	9.2	8.6	9.9	10.0	8.5	8.3	9.9	9.7	
pH	8.7	8.4	8.3	8.2	8.1	7.9	8.3	8.7	8.2	8.2	8.8	8.7	
Conductivity (micromhos/cm)	340	410	430	460	490	480	310	350	410	410	450	440	
Secchi Disc (cm)	61	63	69	61	58	61	66	91*	56	51	71	66	
Volts	190	180	180	180	170	170	190	200	190	185	180	185	
Apps	5.5	8.0	8.0	7.0	8.5	9.0	5.5	5.0	7.0	8.0	7.5	7.5	
Gizzard shad	2	2	-	-	-	-	10	-	-	-	-	-	14
Muskellunge	-	-	-	-	-	-	-	-	-	-	-	-	1
Common carp	1	-	-	-	-	-	1	3	-	5	1	3	27
Quillback	2	5	5	-	1	7	18	2	1	2	7	3	126
White sucker	-	-	-	-	-	-	-	-	-	3	1	1	7
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	-	-	2
Shorthead redhorse	-	-	-	-	-	-	-	1	-	-	-	-	5
Yellow bullhead	-	-	-	-	-	-	-	1	-	-	-	-	2
Channel catfish	-	-	-	1	-	-	-	2	-	-	-	3	11
Rock bass	-	-	2	3	1	-	9	4	4	1	5	5	59
Redbreast sunfish	-	-	2	1	-	3	9	3	3	12	30	116	
Pumpkinseed	4	13	2	6	7	1	2	9	9	7	18	3	185
Bluegill	-	7	-	-	-	-	1	3	1	1	2	-	30
Smallmouth bass	-	1	1	7	2	1	2	10	-	5	5	11	92
Largemouth bass	1	3	-	-	-	-	-	-	1	-	-	-	10
White crappie	-	1	-	-	-	-	-	-	-	-	-	-	4
Black crappie	-	-	-	-	-	1	-	1	2	-	3	-	9
Yellow perch	-	1	-	-	-	-	1	-	-	-	-	-	6
Walleye	2	-	1	5	4	2	3	3	1	2	4	3	68
No. of Specimens	12	33	9	22	19	13	43	53	32	32	54	62	774
No. of Species	6	8	4	5	7	6	9	12	8	9	10	9	39

Table 2. (cont.)

Fishes captured in the AC electrofisher near TMSK in October 1992.

Zone	4A1	16A2	10A3	11B1	10B3	10B1	13A1	9B5	15B2	16B6	15A2	15A1
Date	4 Oct	4 Oct	4 Oct	5 Oct	5 Oct	5 Oct	5 Oct	5 Oct	7 Oct	7 Oct	7 Oct	7 Oct
Time	1932	2006	2047	1917	1956	2032	2106	2146	1905	2006	2049	2119
Duration (min)	16	17	19	16	17	16	19	18	17	15	22	15
Air Temp (C)	20.0	19.0	20.0	19.5	18.5	19.0	19.0	17.5	21.0	23.0	23.0	22.0
Water Temp (C)	19.0	20.0	21.0	20.0	20.0	20.0	20.0	20.0	23.0	22.0	22.0	21.5
Dissolved Oxygen (mg/l)	11.2	11.8	11.5	10.4	10.2	10.6	10.6	10.2	8.8	8.8	10.4	10.1
pH	8.4	8.5	8.2	8.3	8.7	8.8	8.4	8.3	8.4	8.4	8.4	8.4
Conductivity (micromhos/cm)	400	400	450	340	390	400	440	450	750	350	410	410
Secchi Disc (cm)	46	51	41	91*	86	69	46	63	51	157	61	61
Volts	195	190	185	190	185	180	185	175	185	200	200	200
Amps	8.0	8.5	9.0	5.5	8.5	8.5	8.5	9.0	6.1	9.1	7.0	8.3
American shad	-	-	-	-	-	-	-	-	-	-	-	-
Gizzard shad	-	4	-	-	-	-	-	-	-	-	-	-
Muskellunge	-	-	-	-	-	-	-	-	-	-	-	-
Chain pickerel	-	-	-	-	-	-	-	-	-	-	-	-
Common carp	-	-	-	2	1	-	-	-	-	-	1	2
Golden shiner	-	-	-	-	-	1	-	-	-	-	-	-
Quillback	-	2	1	-	2	10	-	4	0	-	8	2
White sucker	1	-	1	-	-	1	1	-	-	-	3	-
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	-	-	1	-	1
Yellow bullhead	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	-	-	-	1	-	-	-	-	-	2	-	-
Rock bass	2	1	2	3	-	2	5	3	8	5	-	6
Redbreast sunfish	1	2	5	1	4	2	9	-	2	8	1	1
Pumpkinseed	9	10	5	14	16	7	3	4	5	3	2	-
Bluegill	3	2	1	-	1	1	-	-	1	4	-	-
Smallmouth bass	1	3	-	1	2	1	3	-	-	16	3	10
Largemouth bass	1	-	-	5	-	-	-	-	1	-	-	-
White crappie	-	-	-	1	-	-	-	-	-	-	-	-
Black crappie	-	-	-	-	1	-	-	-	1	1	-	-
Yellow perch	-	-	-	-	-	-	-	-	1	-	-	-
Walleye	-	2	4	4	1	2	6	6	1	-	1	1
No. of Specimens	18	26	19	33	28	27	25	18	29	42	18	28
No. of Species	7	8	7	10	8	9	6	5	9	10	8	11

* Clear to bottom at indicated depth.

Table 2. (cont.)

Zone	4A1	16A2	10A3	11B1	10B3	10B1	13A1	9B5	15B2	16B6	15A2	15A1	Total
Date	18 Oct	18 Oct	18 Oct	20 Oct	20 Oct	20 Oct	20 Oct	20 Oct	21 Oct	21 Oct	21 Oct	21 Oct	
Time	1915	2006	2050	1848	1918	1955	2023	2105	1850	1944	2035	2127	
Duration (min)	16	18	18	15	15	12	20	13	19	15	18	16	
Air Temp (C)	9.5	8.0	8.0	18.0	18.0	16.0	16.5	16.0	9.0	6.0	7.0	7.5	
Water Temp (C)	11.0	11.5	12.0	13.0	15.0	15.5	15.5	15.0	10.0	8.0	9.0	9.0	
Dissolved Oxygen (mg/l)	10.4	10.4	10.6	12.4	11.8	11.4	12.4	10.8	11.2	10.9	10.2	10.0	
pH	8.0	7.8	7.5	8.4	8.2	8.2	8.2	8.0	8.5	8.5	7.6	8.2	
Conductivity (micromhos/cm)	375	360	440	340	400	425	410	400	350	340	410	410	
Secchi Disc (cm)	97	63	91	97	94	81	36	63	30	91*	107	91*	
Volts	200	195	190	195	190	185	190	180	195	200	195	195	
Amps	5.0	6.5	7.1	6.0	6.0	8.0	7.0	7.5	6.0	5.0	7.0	7.0	
American shad	-	-	-	-	-	-	-	-	-	-	-	-	2
Gizzard shad	-	1	-	-	-	-	1	-	-	-	-	-	8
Muskellunge	-	-	-	-	-	-	-	-	-	-	-	-	1
Chain pickerel	-	-	-	-	-	-	-	-	-	-	1	1	2
Common carp	1	-	-	1	1	1	2	1	1	5	4	4	26
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	-	1
Quillback	1	-	10	-	4	9	1	4	13	2	11	6	98
White sucker	-	-	-	-	-	-	1	-	3	-	1	-	11
Northern hog sucker	-	-	-	1	-	-	-	-	-	-	-	2	3
Shorthead redhorse	2	1	-	1	-	-	-	2	-	-	1	-	9
Yellow bullhead	-	-	-	1	-	-	-	-	1	1	1	-	3
Channel catfish	-	-	-	-	-	-	-	-	-	-	-	-	1
Rock bass	3	9	4	1	-	2	-	4	11	6	7	7	82
Redbreast sunfish	2	-	-	-	-	-	-	-	-	10	23	7	80
Pumpkinseed	20	14	8	7	10	-	4	-	1	17	3	3	164
Bluegill	-	-	-	-	-	-	-	-	3	-	-	-	18
Smallmouth bass	2	8	12	1	3	-	7	-	6	32	6	20	144
Largemouth bass	1	-	-	4	1	-	-	-	2	-	-	-	15
White crappie	1	-	-	3	-	-	-	-	-	-	-	-	3
Black crappie	1	-	1	-	-	-	-	-	2	-	-	1	8
Yellow perch	1	-	-	-	-	-	-	-	-	-	1	1	3
Walleye	-	2	3	-	3	1	5	1	1	7	2	2	52
No. of Specimens	35	35	38	15	27	11	24	7	38	61	80	55	738
No. of Species	11	8	6	6	9	3	9	3	10	9	12	12	22

Table 6.3-10

Fishes captured by the AC electrofisher near TMINS (6 November 1981).

Zone	1588	1589	16A2	15A1	10A3	985	1582	15A1	15A2	10B1	10B3	118
Date	1 Nov	1 Nov	1 Nov	1 Nov	1 Nov	1 Nov	2 Nov	2 Nov	2 Nov	2 Nov	2 Nov	2 Nov
Time	1732	1834	1524	2008	2044	2129	1746	1837	1913	1952	2033	2122
Duration (min)	16	17	17	20	17	17	19	17	16	16	18	17
Air Temp (C)	16.0	15.0	14.0	14.0	14.0	14.0	14.0	16.5	17.0	15.0	15.0	14.0
Water Temp (C)	14.0	12.5	13.0	14.0	14.0	13.5	16.0	15.5	16.0	17.0	15.0	14.0
Dissolved Oxygen (mg/l)	12.4	13.8	14.1	13.6	13.4	12.0	19.0	11.9	12.0	12.3	12.0	10.8
pH	7.9	8.2	7.8	7.8	7.8	7.5	9.0	8.9	8.7	8.9	8.3	8.1
Conductivity (micromhos/cm)	390	390	580	450	450	450	280	425	430	440	410	350
Secchi Disc (cm)	91*	76	61	61	63	61	61	66	61	61	76	102*
Volts	195	190	185	175	185	175	195	195	185	185	185	195
Amps	5.0	6.5	5	7.0	8.0	7.5	5.0	7.0	7.5	8.5	9.0	6.0
Gizzard shad	-	-	-	1	-	-	-	-	1	-	1	-
Muskellunge	-	-	-	-	-	-	-	-	1	-	-	-
Common carp	-	2	2	1	1	-	-	-	-	-	2	-
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	2
Quillback	-	1	-	1	7	14	7	4	17	5	1	2
White sucker	-	-	-	-	-	-	-	-	2	-	-	-
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	-	-
Shorthead redhorse	1	-	-	-	-	-	1	-	1	-	1	-
Yellow bullhead	-	-	-	-	-	-	-	-	-	-	-	2
Channel catfish	-	1	3	-	-	-	-	1	-	-	-	-
Rock bass	24	6	3	6	9	2	4	1	4	-	1	1
Redbreast sunfish	11	5	-	11	1	-	5	3	7	7	3	1
Green sunfish	-	-	-	-	-	-	1	-	-	-	-	-
Pumpkinseed	1	62	6	1	1	5	11	3	-	9	59	43
Bluegill	1	5	-	-	1	-	6	-	-	1	-	8
Smallmouth bass	30	4	5	10	8	3	2	9	1	1	4	-
Largemouth bass	1	9	-	-	-	-	2	-	-	-	1	9
White crappie	-	2	-	-	-	-	1	-	-	-	2	8
Black crappie	2	2	-	-	-	-	2	-	-	-	1	1
Yellow perch	-	1	-	-	-	-	-	-	2	-	10	-
Walleye	9	2	1	3	6	6	4	2	3	5	9	-
No. of Specimens	84	100	20	34	37	30	51	23	37	28	89	77
No. of Species	10	13	6	8	8	5	13	7	10	6	13	10

* Clear to bottom at indicated depth.

Table 6.3-10 continued.

Zone	1582	10B8	4A1	16A2	15A2	15A1	11B1	10B3	10B1	13A1	10A3	985	Total
Date	16 Nov	16 Nov	16 Nov	16 Nov	16 Nov	16 Nov	18 Nov	18 Nov	18 Nov	18 Nov	18 Nov	18 Nov	
Time	1742	1833	1726	2004	2038	-	1734	1811	1845	1923	1956	2028	
Duration (min)	18	14	17	18	14	15	19	19	16	16	17	16	
Air Temp (C)	1.0	1.0	0.0	0.0	1.0	0.0	5.0	6.0	7.0	7.0	7.0	7.0	
Water Temp (C)	4.0	4.0	4.0	4.0	4.0	3.5	6.0	6.5	7.0	7.0	7.5	7.0	
Dissolved Oxygen (mg/l)	14.4	13.0	11.7	11.5	12.8	12.7	13.2	12.6	12.7	12.0	12.0	12.0	
pH	8.2	8.3	7.9	7.8	8.3	8.3	8.1	7.9	7.6	7.5	7.4	7.4	
Conductivity (micromhos/cm)	350	310	260	260	350	350	325	310	310	290	300	300	
Secchi Disc (cm)	152*	112*	76	81	112	107	107*	152	130	122	122	137	
Volts	190	195	200	195	195	190	200	200	205	210	205	205	
Amps	5.5	4.5	5.0	5.0	5.0	5.0	5.0	6.0	5.5	5.0	5.5	5.5	
Gizzard shad	-	-	2	-	-	-	-	-	-	1	-	-	6
Muskellunge	-	-	1	-	-	-	-	-	-	-	-	1	3
Common carp	-	-	-	-	-	-	-	-	-	-	-	-	13
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	-	2
Quillback	-	-	-	-	-	-	-	-	-	-	-	2	61
White sucker	-	2	3	-	-	-	-	-	-	-	-	-	11
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	1	-	1
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-	4
Yellow bullhead	-	-	1	-	-	-	-	-	-	-	-	-	3
Channel catfish	-	-	-	-	-	-	-	-	-	-	-	-	5
Rock bass	15	22	-	6	12	1	-	2	5	3	2	1	126
Redbreast sunfish	1	14	-	1	4	4	2	3	6	13	-	1	103
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1
Pumpkinseed	4	1	7	1	1	-	5	4	11	1	1	-	240
Bluegill	1	-	-	-	-	-	3	-	-	-	1	-	25
Smallmouth bass	-	1	-	2	1	9	3	1	1	6	3	-	120
Largemouth bass	-	-	-	-	-	-	3	-	-	-	-	-	25
White crappie	-	-	-	-	-	-	6	-	2	-	-	-	21
Black crappie	-	-	-	-	-	-	2	-	-	1	-	-	11
Yellow perch	-	-	-	-	-	-	-	1	-	-	-	1	15
Walleye	1	-	2	2	3	-	-	-	-	-	-	1	54
No. of Specimens	22	56	16	12	21	14	24	11	23	26	8	7	850
No. of Species	5	5	6	5	5	3	7	5	5	7	5	6	21

Table 4. (cont.)

* Collected by 41' Al electrofisher near TRINS on December 1982.

	1982	1989	4A1	16A2	13A7	15A1	13A7	15A3	9B3	10B3	10B3	11B1
Zone	2 Dec	6 Dec	6 Dec	6 Dec	8 Dec	8 Dec	7 Dec	7 Dec	7 Dec	7 Dec	7 Dec	7 Dec
Time	1723	1733	1828	1800	1951	2034	1726	1800	1838	1916	1932	2036
Duration (min)	19	14	17	18	14	14	18	17	18	16	20	15
Air Temp (C)	10.0	12.5	10.0	9.0	9.0	9.0	7.0	6.0	6.0	6.0	6.0	4.0
Water Temp (C)	7.5	11.7	12.0	12.0	11.7	11.0	10.0	10.0	10.0	9.5	9.0	10.0
Dissolved Oxygen (mg/l)	11.3	10.6	10.4	9.8	11.0	17.8	10.3	10.7	10.4	11.9	11.8	10.0
pH	8.7	8.1	8.1	8.1	7.8	8.1	8.3	8.3	8.3	8.8	8.8	7.8
Conductivity (microhm/cm)	300	183	260	260	225	197	211	271	171	225	193	300
Secchi Disc (cm)	2A	1A	91	76	122	91	86	76	76	132	151	91
Volts	200	210	205	205	210	210	195	195	195	200	200	190
Ampe	5.5	4.0	5.5	4.0	5.0	4.0	4.3	5.5	5.5	4.5	4.5	5.5
izzard shad	-	-	-	-	-	-	-	-	-	-	-	-
Muskellunge	-	-	-	2	1	-	-	-	1	-	-	-
Common carp	5	-	-	-	1	-	-	-	-	-	-	3
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	8
Fatfish	-	-	-	-	-	1	-	-	-	-	-	-
Quillback	2	2	1	-	3	2	-	-	3	-	-	1
White sucker	-	2	3	-	-	1	-	-	-	-	-	-
Northern hog sucker	-	-	-	-	-	2	-	-	-	-	-	-
Shorthead redhorse	-	-	-	1	-	-	-	-	-	-	-	-
Channel catfish	-	-	-	-	1	1	-	-	1	-	-	-
Rock bass	13	32	-	13	13	14	2	2	4	6	4	-
Redbreast sunfish	4	14	1	9	27	11	4	2	2	13	-	1
Green sunfish	-	-	-	-	1	-	-	-	-	-	-	-
Pumpkinseed	11	-	6	8	7	2	4	2	7	17	8	73
Bluegill	17	-	1	-	1	-	-	-	-	-	-	5
Smallmouth bass	-	18	1	15	5	5	6	7	2	-	-	-
Largemouth bass	1	-	-	-	-	-	-	-	-	-	-	2
White crappie	-	-	-	-	-	-	-	-	-	2	-	3
Black crappie	4	-	-	1	-	-	-	-	-	-	-	7
Yellow perch	1	-	-	-	-	-	-	-	1	-	-	-
Walleye	1	2	1	25	8	-	14	24	71	1	1	-
No. of specimens	61	72	15	74	89	39	38	98	5	47	20	110
No. of Species	9	8	8	8	11	9	5	5	4	5	5	8

* Clear to bottom at indicated depth.

* 3-11 continued:

	13A1	16A3	9B3	10B1	10B3	11B1	15B2	18B4	4A1	16A2	15A2	13A1	Total
Zone	15 Dec	15 Dec	13 Dec	15 Dec	15 Dec	15 Dec	20 Dec	20 Dec	20 Dec	20 Dec	20 Dec	20 Dec	
Time	1719	1741	1808	1837	1905	1935	1726	1801	1831	1855	1920	1939	
Duration (min)	15	16	18	15	19	13	14	10	13	11	11	11	
Air Temp (C)	5.0	5.0	5.0	4.5	4.0	5.5	2.0	2.0	2.5	2.0	2.0	2.0	
Water Temp (C)	2.0	2.0	2.0	1.0	1.0	2.0	2.5	1.5	2.0	2.0	1.5	1.5	
Dissolved Oxygen (mg/l)	14.2	14.0	14.2	14.8	14.8	14.8	13.1	14.0	13.0	13.2	14.1	14.4	
pH	8.4	8.3	8.3	8.7	8.5	8.5	8.5	7.8	7.3	7.9	7.8	7.9	
Conductivity (microhm/cm)	290	300	300	225	192	310	260	156	230	260	167	160	
Secchi Disc (cm)	172*	188*	183	193*	193*	91*	81	117	61	61	76	91	
Volts	195	200	200	205	210	200	195	210	200	205	210	210	
Ampe	5.5	5.0	5.0	3.5	3.0	3.0	4.5	2.0	4.0	4.0	2.0	2.0	
izzard shad	-	-	-	-	-	-	1	-	-	-	-	-	1
Muskellunge	-	-	-	-	-	-	-	-	-	-	-	-	1
Common carp	-	-	-	-	-	-	-	-	-	-	-	-	9
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	-	6
Fatfish	-	NO	-	NO	NO	-	-	NO	NO	-	NO	-	1
Quillback	-	-	-	-	-	-	-	-	-	-	-	-	14
White sucker	-	-	-	-	-	-	-	-	-	-	-	-	6
Northern hog sucker	-	-	-	-	-	-	-	-	-	1	-	-	3
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-	1
Channel catfish	-	FISH	-	FISH	FISH	-	-	FISH	FISH	-	FISH	-	5
Rock bass	-	-	-	-	-	-	-	-	-	-	-	-	104
Redbreast sunfish	-	-	-	-	-	-	-	-	-	-	-	-	95
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1
Pumpkinseed	1	-	-	-	-	2	2	-	-	-	-	-	150
Bluegill	-	TAKEN	-	TAKEN	TAKEN	-	2	TAKEN	TAKEN	-	TAKEN	-	34
Smallmouth bass	-	-	-	-	-	-	1	-	-	-	-	-	60
Largemouth bass	-	-	1	-	-	-	-	-	-	-	-	-	4
White crappie	-	-	-	-	-	-	-	-	-	-	-	-	3
Black crappie	-	-	-	-	-	-	1	-	-	-	-	-	15
Yellow perch	-	-	1	-	-	-	-	-	-	-	-	-	2
Walleye	2	-	-	-	-	-	1	-	-	-	-	-	96
No. of specimens	3	0	2	0	0	2	8	0	0	1	1	1	41
No. of Species	2	0	2	0	0	1	6	0	0	1	0	1	21

Table 6.3-12

Summary of fishes captured by the AC electrofisher at 12 zones near TMINS in 1982.

Zones	TM-AQF-15B2		TM-AQF-16B8		TM-AQF-4A1		TM-AQF-15A1		TM-AQF-15A2		TM-AQF-16A2		TM-AQF-13A1		TM-AQF-10A3		TM-AQF-9B5		TM-AQF-10B1		TM-AQF-10B3		TM-AQF-11B1		Total			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
American shad	-	-	-	-	-	-	-	-	2	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	+
Gizzard shad	29	3.4	-	-	6	1.6	-	-	2	0.4	5	1.0	4	0.9	-	-	2	0.6	-	-	3	0.6	6	1.0	57	0.9		
Brown trout	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.2	1	+		
Muskellunge	1	0.1	-	-	1	0.3	1	0.2	2	0.4	2	0.4	-	-	-	-	2	0.6	1	0.3	1	0.2	2	0.3	13	0.2		
Chain pickerel	-	-	-	-	-	-	1	0.2	1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	+		
Common carp	21	2.5	21	2.5	13	3.5	21	3.7	16	3.4	15	2.9	8	1.8	7	1.3	11	3.3	6	1.8	24	4.9	18	3.1	181	2.9		
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.3	-	-	-	-	14	2.4	15	0.2	
Fallfish	1	0.1	4	0.5	-	-	6	1.1	5	1.1	3	0.6	4	0.9	1	0.2	-	-	-	-	-	-	-	-	-	24	0.4	
Quillback	14	16.5	38	4.5	23	6.1	39	6.9	83	17.6	38	7.3	27	5.9	42	8.1	88	26.7	85	25.4	42	8.6	70	11.9	716	11.3		
White sucker	-	-	38	4.5	9	2.4	11	2.0	10	2.1	22	4.2	11	2.4	17	3.3	3	0.9	3	0.9	-	-	-	1	0.2	125	2.0	
Northern hog sucker	-	-	-	-	-	-	6	1.1	-	-	2	0.4	2	0.4	1	0.2	-	-	-	-	-	-	-	1	0.2	12	0.2	
Shorthead redhorse	9	1.1	26	3.1	2	0.5	18	3.2	4	0.8	15	2.9	16	3.5	20	3.9	2	0.6	2	0.6	7	1.4	2	0.3	123	1.9		
Yellow bullhead	-	-	3	0.4	1	0.3	-	-	1	0.2	-	-	-	-	-	-	-	-	-	-	1	0.2	4	0.7	10	0.2		
Brown bullhead	-	-	-	-	2	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.2	-	3	+	
Channel catfish	2	0.2	13	1.5	1	0.3	8	1.4	2	0.4	5	1.0	6	1.3	2	0.4	1	0.3	-	-	1	0.2	3	0.5	44	0.7		
Margined madtom	-	-	-	-	-	-	-	-	-	-	-	1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	1	+	
Rock bass	187	22.0	178	21.1	25	6.6	82	14.7	43	9.1	71	13.6	52	11.4	48	9.2	23	7.0	19	5.7	10	2.0	7	1.2	745	11.7		
Redbreast sunfish	100	11.8	162	19.2	23	6.1	165	29.4	122	25.9	41	7.9	90	19.7	70	13.5	12	3.6	46	13.8	17	3.5	9	1.5	817	13.5		
Green sunfish	5	0.6	-	-	-	-	-	-	1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	0.1	
Pumpkinseed	152	17.9	39	4.6	179	47.6	40	7.1	85	18.0	111	21.3	65	14.3	115	22.2	62	18.8	116	34.7	196	39.9	284	48.3	1444	22.8		
Bloegill	51	6.0	23	2.7	17	4.5	8	1.4	12	2.5	9	1.7	4	0.9	21	4.0	35	10.6	15	4.5	71	14.5	56	9.5	322	5.3		
Lepomis hybrid	1	0.1	1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.2	-	-	3	+		
Smallmouth bass	90	10.6	251	29.8	31	8.2	131	23.3	39	8.3	125	23.9	111	24.3	91	17.5	38	11.5	15	4.5	64	13.0	9	1.5	995	15.7		
Largemouth bass	13	1.5	2	0.4	13	3.5	-	-	-	-	-	-	-	-	-	-	1	0.3	-	-	9	1.8	38	6.5	77	1.2		
White crappie	3	0.4	2	0.2	4	1.1	-	-	-	-	1	0.2	2	0.4	1	0.2	2	0.6	4	1.2	7	1.4	34	5.8	60	0.9		
Black crappie	11	1.3	11	1.3	5	1.3	5	0.9	3	0.6	2	0.4	2	0.4	3	0.6	2	0.6	-	-	6	1.2	13	2.2	62	1.0		
Yellow perch	10	1.2	1	0.1	2	0.5	1	0.2	3	0.6	-	-	-	-	1	0.2	3	0.9	1	0.3	13	2.6	-	-	35	0.6		
Walleye	22	2.6	29	3.4	10	5.1	19	3.4	35	7.4	55	10.5	51	11.2	79	15.2	43	13.0	20	6.0	17	3.5	16	2.7	605	8.4		
No. of Specimens	849		843		376		562		471		522		456		519		330		334		491		588		6341			
No. of Species	18		17		19		17		20		17		17		16		17		14		18		20		27			
Catch/Effort	42.4		42.1		18.8		28.1		23.6		28.1		22.8		25.9		16.5		16.7		24.6		29.4		28.4			
Diversity Index	3.19		2.97		2.88		2.99		3.11		3.13		3.09		3.09		3.05		2.87		2.92		2.75		3.35			
Mean No. fish/min	1.46		2.91		2.17		1.82		1.46		1.59		1.33		1.59		0.87		1.06		1.42		1.79		1.64			

+ Less than 0.05%.

Table 6.3-13
 Monthly summary of fishes captured by the AC electrofisher near THIRU, March through December 1962. Numbers in parentheses denote ranks.

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
No. of Collections	26	24	26	26	26	26	26	26	26	26	260
American shad	-	-	-	-	-	-	-	2	-	-	2
Gizzard shad	1	3	1	2	5	15(9)	16(9)	8	6	2	57
Brown trout	-	1	-	-	-	-	-	-	-	-	1
Muskellunge	3	-	-	-	-	-	1	1	3	5	13
Chain pickerel	-	-	-	-	-	-	-	2	-	-	2
Common carp	21(3)	16(7)	15	21(9)	11(8)	22(8)	27(8)	26(7)	13	1(9)	181(8)
Golden shiner	-	-	4	-	-	-	-	1	2	8(10)	15
Fallfish	4(10)	6	10	3	2	-	-	-	-	1	26
Quillback	43(1)	69(3)	56(6)	37(6)	110(3)	102(2)	126(2)	98(3)	61(5)	16(8)	716(5)
White sucker	-	11(8)	32(8)	32(7)	13(7)	2	7	11(10)	11	6	125(9)
Northern hog sucker	-	1	1	1	-	-	2	3	1	3	12
Shorthead redhorse	6(7)	29(5)	21(9)	39(5)	7(10)	2	5	3	4	1	123(10)
Yellow bullhead	-	-	2	-	-	-	2	-	3	-	10
Broom bullhead	-	-	3	1	-	-	-	-	-	-	3
Channel catfish	6(7)	4	3	1	2	6(10)	11(10)	3	5	3	64
Margined madtom	-	-	-	1	-	-	-	-	-	-	1
Rock bass	30(2)	120(1)	75(5)	50(3)	54(5)	60(6)	59(6)	82(6)	126(2)	109(2)	765(4)
Redbreast sunfish	3	10(9)	16(3)	6(4)	68(1)	90(3)	116(3)	80(5)	103(4)	99(3)	657(3)
Green sunfish	11(4)	93(2)	293(1)	69(2)	132(2)	107(1)	185(1)	166(1)	260(1)	150(1)	1644(1)
Pumpkinseed	8(6)	10(9)	85(6)	11(10)	50(6)	67(5)	30(7)	18(8)	25(7)	35(6)	372(7)
Bluegill	-	-	1	-	-	2	-	-	-	-	3
Lepomis hybrid	11(4)	25(6)	158(2)	231(1)	86(4)	70(4)	92(4)	144(2)	120(3)	60(5)	995(2)
Swainson's bass	-	2	6	5	5	5	10	15(9)	25(7)	4	77
Largemouth bass	-	3	16(10)	1	5	-	4	5	21(9)	5	60
White crappie	-	1	8	3	3	5	9	8	11	15(7)	63
Black crappie	-	-	1	2	3	3	6	3	15(10)	2	35
Yellow perch	5(2)	31(4)	43(7)	22(8)	8(9)	25(7)	68(5)	52(6)	56(5)	96(4)	405(6)
Walleye	153	433	977	578	663	544	7%	738	850	631	6361
No. of Specimens	13	18	22	19	18	16	19	22	21	21	27
Diversity Index	3.09	3.07	3.18	2.96	2.99	3.08	3.26	3.27	3.26	3.14	3.35

Table 6.3-14

Results of the two factor analysis of variance test for monthly mean condition factor (K) for rock bass, redbreast sunfish, pumpkinseed, smallmouth bass, and walleye taken by the AC electrofisher at 12 zones near TMINS, April through November 1976 through 1982.

Rock bass	Source of Variation	df	SS	MS	F
	Subgroups	55	151.12	2.75	
	Years	6	70.14	11.69	142.05*
	Months	7	70.14	10.02	121.75*
	Interaction	42	10.83	0.26	3.13*
	Error	4618	380.07	0.08	
	Total	4673	531.19		
Redbreast sunfish	Source of Variation	df	SS	MS	F
	Subgroups	55	237.93	4.33	
	Years	6	37.03	6.17	54.57*
	Months	7	162.91	23.27	205.77*
	Interaction	42	37.99	0.90	7.99*
	Error	5646	638.55	0.11	
	Total	5701	876.48		
Pumpkinseed	Source of Variation	df	SS	MS	F
	Subgroups	55	253.90	4.62	
	Years	6	149.32	24.89	197.20*
	Months	7	56.96	8.14	64.48*
	Interaction	42	47.62	1.13	8.99*
	Error	7831	988.24	0.13	
	Total	7886	1242.14		
Smallmouth bass	Source of Variation	df	SS	MS	F
	Subgroups	55	62.76	1.14	
	Years	6	26.86	4.48	83.81*
	Months	7	12.02	1.72	32.12*
	Interaction	42	23.86	0.57	10.63*
	Error	8675	463.76	0.05	
	Total	8730	526.52		
Walleye	Source of Variation	df	SS	MS	F
	Subgroups	55	6.68	0.12	
	Years	6	1.29	0.27	18.52*
	Months	7	1.99	0.28	24.53*
	Interaction	42	3.40	0.08	6.97*
	Error	3008	34.93	0.01	
	Total	3063	41.61		

* Significant at $P < 0.05$.

Table 6.3-12

Results of Duncan's new multiple range test for differences in yearly mean condition factor (K) for rock bass, redbreast sunfish, pumpkinseed, smallmouth bass, and walleye taken by the AC electrofisher at 12 zones near TMINS, April through November 1976 through 1982. Years are ranked from lowest to highest mean K. Means underlined were not significantly different ($P \leq 0.05$).

Rock bass							
Year	1981	1978	1982	1976	1977	1980	1979
Mean K	2.20	2.21	2.28	2.29	2.29	2.38	2.56
Redbreast sunfish							
Year	1981	1977	1978	1980	1982	1976	1979
Mean K	2.36	2.48	2.50	2.52	2.53	2.55	2.76
Pumpkinseed							
Year	1981	1978	1976	1982	1977	1980	1979
Mean K	2.40	2.48	2.52	2.55	2.57	2.63	2.91
Smallmouth bass							
Year	1978	1981	1982	1977	1976	1980	1979
Mean K	1.42	1.49	1.50	1.50	1.51	1.58	1.62
Walleye							
Year	1981	1978	1982	1979	1976	1980	1977
Mean K	0.97	0.97	0.98	1.00	1.00	1.01	1.03

Table 6.3-16

Results of Duncan's new multiple range test for differences in monthly mean condition factor (K) for rock bass, redbreast sunfish, pumpkinseed, smallmouth bass, and walleye taken by the AC electrofisher at 12 zones near TMINS, April through November 1976 through 1982. Months are ranked from lowest to highest mean K. Means underlined are not significantly different ($P \leq 0.05$).

Rock bass								
Month	Oct	Sep	Nov	Apr	Aug	Jul	May	Jun
Mean K	2.19	2.21	2.24	2.28	2.34	2.41	2.42	2.57
Redbreast sunfish								
Month	Apr	Nov	Oct	Sep	Aug	Jul	May	Jun
Mean K	2.33	2.36	2.39	2.44	2.45	2.58	2.63	2.90
Pumpkinseed								
Month	Oct	Nov	Jul	Apr	Aug	Sep	May	Jun
Mean K	2.47	2.52	2.52	2.54	2.56	2.57	2.58	2.85
Smallmouth bass								
Month	Apr	May	Oct	Nov	Jun	Sep	Aug	Jul
Mean K	1.45	1.48	1.48	1.50	1.53	1.53	1.55	1.56
Walleye								
Month	Apr	May	Nov	Oct	Aug	Sep	Jun	Jul
Mean K	0.94	0.98	0.99	1.00	1.01	1.02	1.03	1.03

Table 6.3-17

Index of percentage similarity for species composition collected at the electrofishing zones in York Haven Pond, 1982.

	15B2	16B8	4A1	15A1	15A2	16A2	13A1	10A3	9B5	10B1	10B3	11B1
15B2 ⁺	-											
16B8	63.9	-										
4A1	60.6	44.1	-									
15A1	60.1	81.4	46.4	-								
15A2	74.3	58.8	60.9	70.9	-							
16A2	67.1	71.2	63.0	73.8	67.7	-						
13A1	62.4	78.6	53.8	81.6	72.4	85.3	-					
10A3	67.9	64.6	63.8	67.0	72.5	84.3	81.1	-				
9B5	70.4	42.7	60.8	46.9	71.4	66.6	59.3	70.0	-			
10B1	66.8	42.8	71.6	46.5	71.9	58.1	65.4	67.1	72.9	-		
10B3	60.1	40.0	77.7	43.9	52.8	58.2	47.9	60.2	65.8	65.4	-	
11B1	49.9	24.5	76.5	27.7	44.8	43.1	32.7	44.4	53.4	62.1	73.9	-

* Prefix TM-AQF- deleted from table.

Table 6.3-18

Kendall's tau correlation coefficients for the species composition collected at the electrofishing zones in York Haven Pond, 1982.

	15B2	16B8	4A1	15A1	15A2	16A2	13A1	10A3	9B5	10B1	10B3	11B1
15B2 ⁺	-											
16B8	.43	-										
4A1	.66	.58	-									
15A1	.39	.68	.45	-								
15A2	.50	.60	.53	.69	-							
16A2	.43	.69	.56	.74	.65	-						
13A1	.42	.70	.53	.75	.60	.84	-					
10A3	.46	.72	.58	.71	.65	.71	.73	-				
9B5	.55	.48	.64	.46	.61	.53	.47	.60	-			
10B1	.46	.47	.57	.47	.59	.48	.46	.58	.69	-		
10B3	.60	.38**	.58	.35**	.42	.37**	.35**	.48	.61	.50	-	
11B1	.39	.26*	.42	.17*	.22*	.15*	.18*	.27*	.34**	.36**	.51	-

⁺ Prefix TM-AQF- deleted from table.

* No correlation at $P \leq 0.05$.

** No correlation at $P \leq 0.01$.

Table 6.3-19

Results of the three factor analysis of variance test for mean numbers of fish per minute taken by the AC electrofisher at 12 zones near TMINS during 15 sampling periods, 1977 through 1982.

Source of Variation	df	SS	MS	F
Years	5	42.43	8.49	8.23*
Sampling periods	14	289.75	20.69	20.08*
Zones	11	157.02	14.27	13.85*
Interactions				
Years X sampling periods	70	225.69	3.22	3.13*
Years X zones	55	146.61	2.67	2.59*
Sampling periods X zones	154	353.90	2.29	2.23*
Residual	770	793.51	1.03	
Total	1079	2008.92		

* Significant at $P \leq 0.05$.

Table 6.3-20

Results of Duncan's new multiple range test for differences among yearly mean numbers of fish per minute taken by the AC electrofisher at 12 zones near TMINS, 1977 through 1982. Years are ranked from lowest to highest mean number of fish per minute. Means underlined are not significantly different ($P \leq 0.05$).

Year	1980	1982	1977	1979	1978	1981
Mean	1.59	1.83	1.96	2.00	2.15	2.18

Table 6.3-21

Results of Duncan's new multiple range test for differences among mean numbers of fish per minute captured by the AC electrofisher on 15 sampling dates, April through November 1977 through 1982. Dates are ranked from lowest to highest mean number of fish per minute. The numerals 1 and 2 after the month refers to the first or second sample period during the month. Means underlined are not significantly different ($P \leq 0.05$).

Date	Jul 2	Jul 1	Aug 1	Jun 2	Jun 1	Apr 1	Aug 2	May 2	Sep 1	Sep 2	Nov 1	May 1	Apr 2	Oct 2	Oct 1
Mean	1.15	1.35	1.41	1.43	1.51	1.60	1.79	1.93	2.09	2.19	2.23	2.52	2.62	2.64	2.81

Table 6.3-22

Results of Duncan's new multiple range test for differences among mean numbers of fish per minute captured by the AC electrofisher at 12 zones near TMINS, 1977 through 1982. Zones are ranked from lowest to highest mean number of fish per minute. Means underlined are not significantly different ($P \leq 0.05$).

Zones	15A2*	10B1	9B5	4A1	10B3	15A1	15B2	11B1	13A1	16B8	16A2	10A3
Mean	1.31	1.33	1.63	1.73	1.85	1.89	2.13	2.14	2.16	2.27	2.47	2.50

* Prefix TM-AQF- deleted from table.

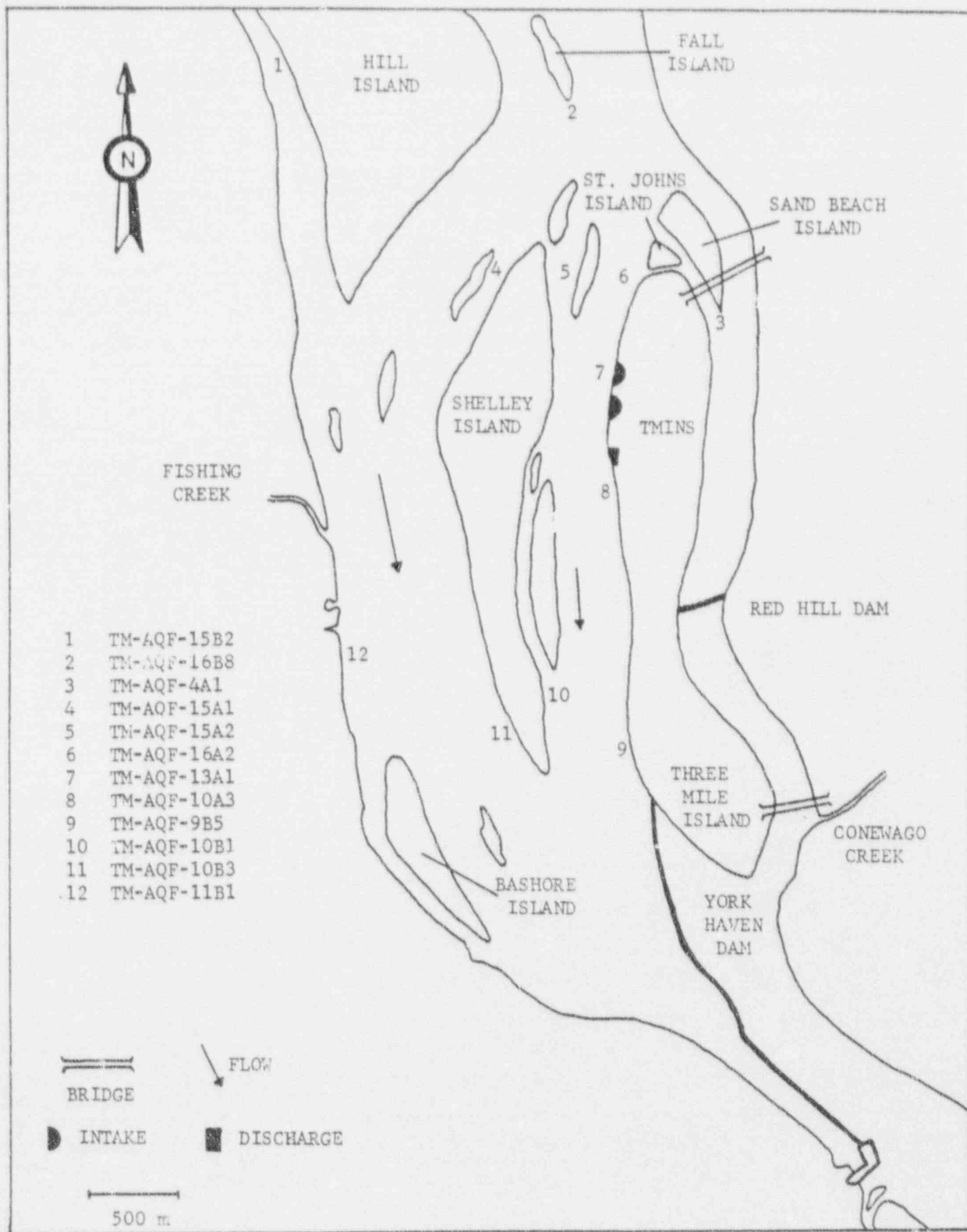


Figure 6.3-1. Location of the AC electrofishing zones sampled in York Haven Pond.

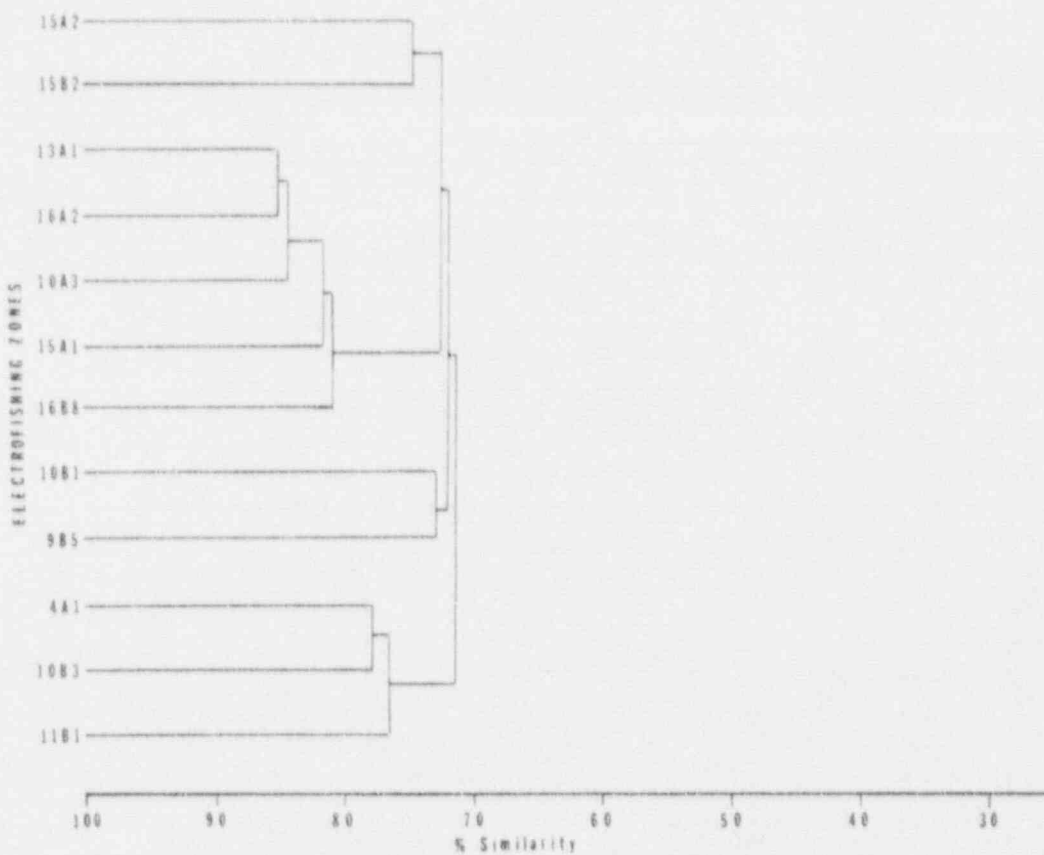


Figure 6.3-2. Single linkage dendrogram classification for the relationship of the 12 electrofishing zones sampled in York Haven Pond, by percent (%) similarity values, 1982.

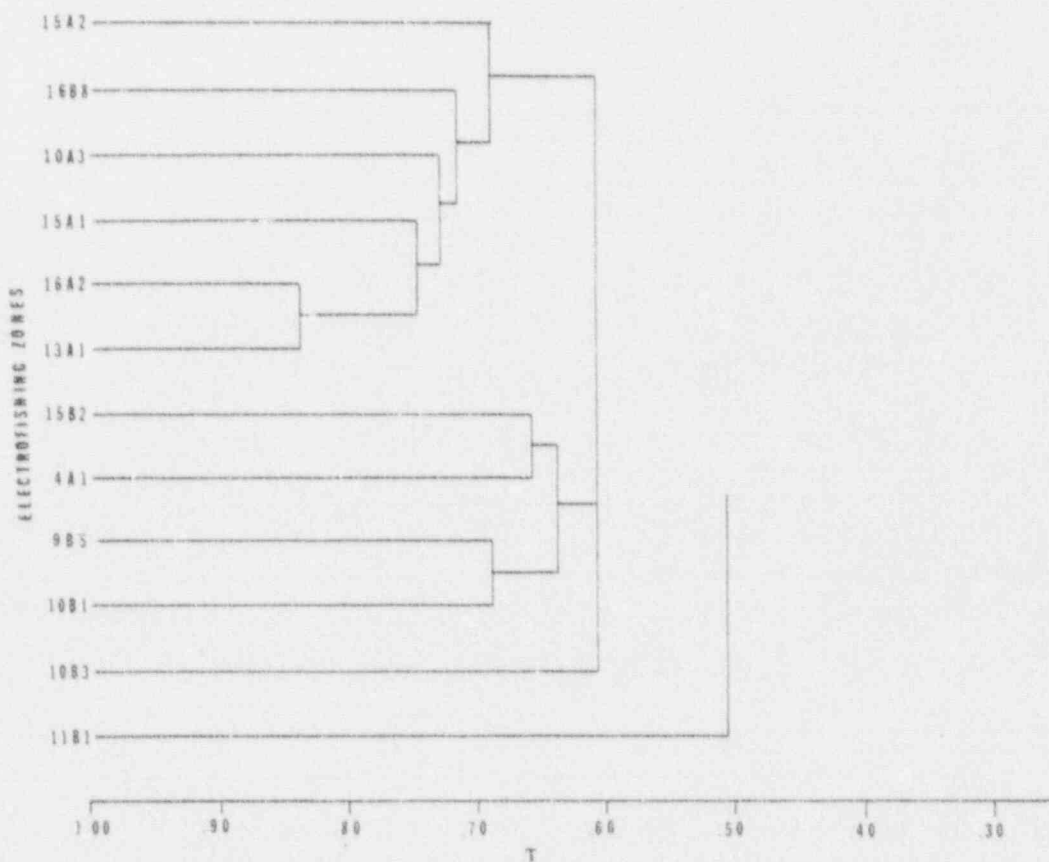


Figure 6.3-3. Single linkage dendrogram classification for the relationship of the 12 electrofishing zones sampled in York Haven Pond, by Kendall's tau (τ) correlations, 1982.

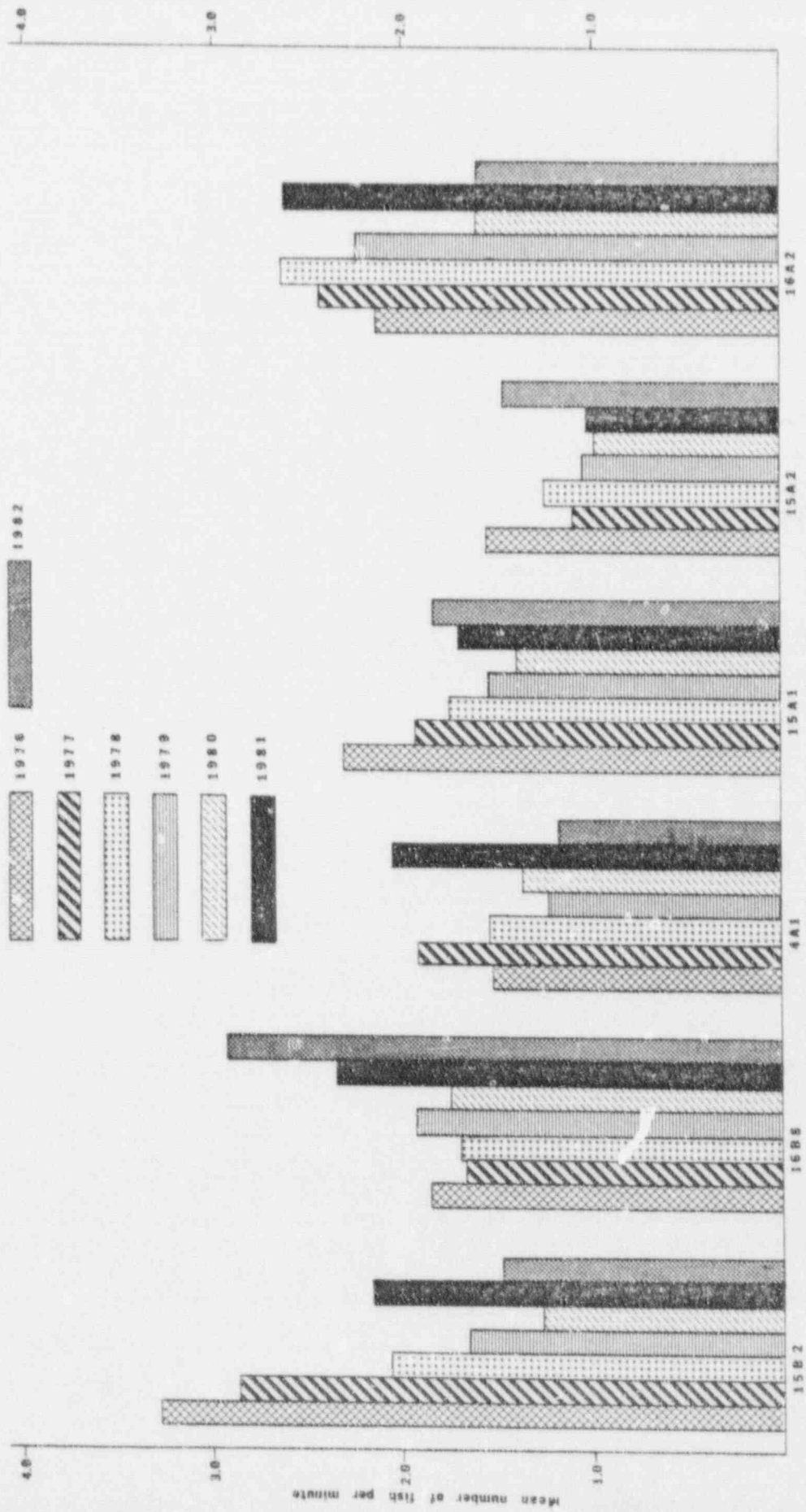


Figure 6.3-4. Mean number of fish per minute at the 12 electrofishing zones near THING, 1976 through 1982.

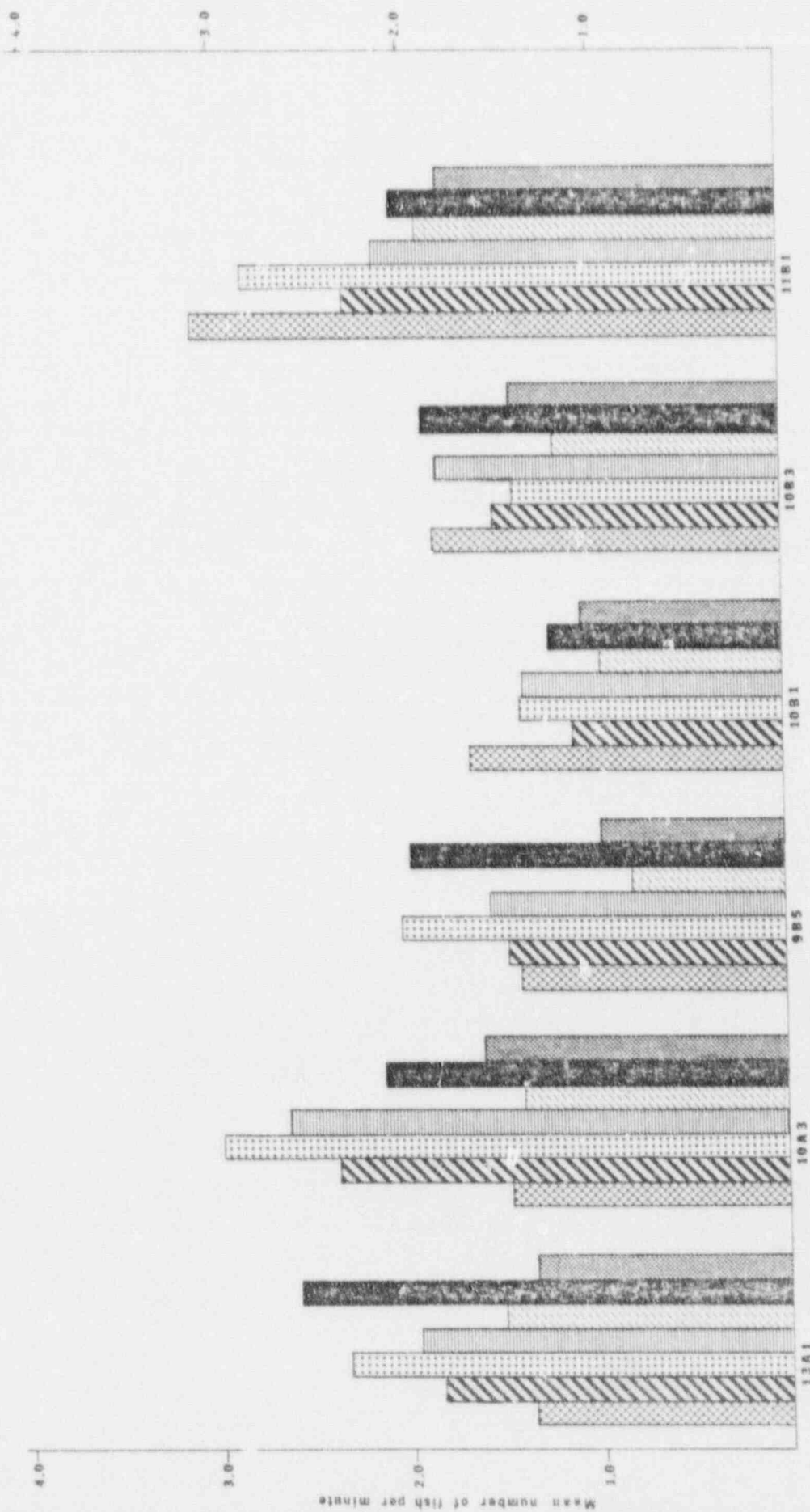


Figure 6.3-4. cont. (inset)

7.0 MOVEMENTS OF FISHES

Studies of the movements of the brown bullhead, channel catfish, rock bass, and smallmouth bass began in 1974. The walleye and largemouth bass were added to the program in 1975 and 1976, respectively. Studies were made to (1) determine the distance and direction traveled by tagged fish; and (2) if movement was affected by TMINS.

7.1 METHODS

Some specimens captured by IA during the electrofishing, trapnet, and population estimate programs (described in Sections 6.3, 6.1, and 8.0, respectively) were tagged. Each tagged fish was measured (to the nearest mm fork length, FL) and weighed (to the nearest 1.0 g) in the field. Healthy specimens of the brown bullhead (>235 mm FL), channel catfish (>225 mm FL), rock bass (>155 mm FL), smallmouth bass (>200 mm FL), largemouth bass (>200 mm FL), and walleye (>300 mm FL) were tagged with sequentially numbered "spaghetti" tags (FD67, Floy Tag and Mfg. Co., Seattle, Washington) inscribed with the laboratory address. To help elicit angler response, a fishing lure and a chance for a cash prize were given as rewards for each tag returned. Posters that explained the purpose of the program were displayed in public places and local establishments near York Haven Pond.

Fishes captured in the electrofishing and trapnet programs were tagged and released near the point of capture (Tables 7.1-1 and 7.1-2 and Figures 7.1-1 and 7.1-2).

Metropolitan Edison Company personnel from the York Haven Generating Station conducted shocking operations to remove fishes trapped in the isolated pools below York Haven Dam on 19, 20, and 26 July 1982. Shocked fish were measured by IA personnel and healthy specimens of the species under study were tagged. All fish captured below the Dam were released into York Haven Pond (Figure 7.1-1).

Tagged fish were recaptured in 1982 by anglers and personnel of Metropolitan Edison Company, Philadelphia Academy of Natural Sciences, and IA. Angler recaptures are listed in Table 7.1-3 and located in Figures 7.1-3 and 7.1-4.

Movement by fish was classified as: no movement, upstream, downstream, and complex. Complex movement involved movement across channels in York Haven Pond, sometimes coupled with upstream or downstream movement. Movement out of the main stem of the Susquehanna River into tributaries was also considered complex.

The chi-square test for independence was applied to test the hypotheses that type of movement and distance moved was independent of season. Contingency tables (10 by 3) were arranged for all rock bass and smallmouth bass that moved (1974 through 1982). Chi-square analysis could not be done for other fishes because of the low numbers of recaptures. The tables were arranged first with rows equal to season of movement and columns equal to type of movement and then with rows equal to season of movement and columns equal to distance moved (all directions combined). Seasons were defined as: winter (21 December to 20 March),

spring (21 March to 20 June), summer (21 June to 20 September), and fall (21 September to 20 December). Movements which took place over two seasons were assigned to separate categories of winter-spring, spring-summer, summer-fall, and fall-winter. Movements occurring over more than two seasons or more than a year were also assigned separate categories. Distance moved was arranged into three categories: 0.0 to 0.3 km, 0.6 to 2.0 km, and greater than 2.1 km.

Chi-square was computed by the method of Conover (1971):

$$\chi^2 = \sum_{i=1}^R \sum_{j=1}^C \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where $E_{ij} = R_i C_j / N$, and E_{ij} = the expected number in cell ij ; O_{ij} = the observed number in cell ij ; R_i = the total of the i^{th} row; C_j = the total of the j^{th} column; and N = the sum of the numbers in all the cells.

Conover (1971) states that if and E_{ij} values are less than 1.0, or if more than 20% of the E_{ij} 's are less than 5.0, the chi-square approximation may be poor. After the original computation of the E_{ij} 's, those seasons with zero totals were eliminated; some seasons were combined to meet the criteria of the test.

The chi-square test for independence also was applied to a 6 by 3 contingency table with rows equal to species and columns equal to type of movement for all fish that moved (1974 through 1982) to test the hypothesis that type of movement was independent of species.

To test for possible effects of TMINS on movements, the chi-square test for differences of probabilities was used to compare combined rock bass and smallmouth bass movements from the areas upstream of the Discharge (electrofishing Zones 16A2 and 13A1 and trapnet Station 1A3) to three areas downstream of the Discharge (electrofishing Zone 10A3 and trapnet Stations 11A2 and 11A3). Two analyses were performed; first on a 2 by 4 contingency table with rows equal to the upstream and downstream areas and columns equal to type of movement. The second analysis was on a 2 by 3 contingency table with rows equal to the upstream and downstream areas and columns equal to distance moved.

A nonparametric binomial test (Conover 1971) was used to test the hypotheses that the proportions ($p = 1/2$) of mobile and sedentary individuals of each species were similar among yearly and total numbers; and that the proportions ($p = 1/3$) of individuals of each species that made various types of movements were similar; a significance level of $P \leq 0.05$ was used.

7.2 RESULTS

A total of 1,165 fish was tagged in 1982: 16 brown bullhead, 158 channel catfish, 476 rock bass, 426 smallmouth bass, 54 largemouth bass, and 35 walleye (Table 7.2-1).

A total of 106 tagged specimens was recaptured in 1982; eight of these were recaptured twice and one was recaptured three times. The total number of recaptures, including multiple recaptures, was 116: 5 brown bullhead, 9 channel catfish, 60 rock bass, 37 smallmouth bass, 3 largemouth bass, and 2 walleye (Table 7.2-2). Tag and recapture histories of all fish recaptured in 1982 appear in Table 7.2-3.

Of 106 fish recaptured in 1982, 61 were tagged in 1982, 43 in 1981, 1 in 1980, and 1 in 1978 (Table 7.2-4).

Most 1982 recaptures (3 brown bullhead, 7 channel catfish, 48 rock bass, 28 smallmouth bass, 3 largemouth bass, and 1 walleye) were taken within York Haven Pond (Table 7.2-5); the area bounded by York Haven and Red Hill dams to the south, and the north ends of Hill and Fall islands to the north (Figure 7.1-3). The three brown bullhead were recaptured within areas where they were tagged and were free an average of 157.7 days. Two channel catfish, free an average of 113.5 days, did not move; two moved upstream (average days free 27.0, average distance traveled 4.6 km); two moved downstream (73.5 days, 0.4 km); and one made a 2.1 km complex movement in 176 days. Movements by rock bass were no movement (66.7%, 91.8 days), upstream (8.3%, 397.8 days, 1.5 km), downstream (18.8%, 141.8 days, 0.8 km), and complex (6.3%, 190.7 days, 0.6 km). Smallmouth bass movements were no movement (75.0%, 77.9 days), upstream (3.6%, 151 days, 5.2 km), downstream (7.1%, 31.0 days, 2.2 km), and complex (14.3%, 34.8 days, 1.5 km). Two largemouth bass, free an average of 134.0 days, did not move; one moved 1.6 km downstream in 24 days. The walleye was found dead by an angler on the day of its release above York Haven Dam during Metropolitan Edison Company's shocking operations.

Twenty-six fish moved out of York Haven Pond in 1982 (2 brown bullhead, 2 channel catfish, 12 rock bass, 9 smallmouth bass, and 1 walleye) (Table 7.2-6). The brown bullhead moved downstream distances of 3.0 and 15.3 km and were free for 648 and 164 days, respectively

(Table 7.2-3). The channel catfish, free 101 and 45 days, moved downstream distances of 8.2 and 5.6 km, respectively. Movements by rock bass were upstream (33.3%, average days free 99.5, average distance traveled 25.8 km), downstream (15.7%, 221 days, 2.3 km), and complex (50.0%, 147.3 days, 4.3 km). Most rock bass making complex movements moved up Swatara Creek. Movements by smallmouth bass were upstream (33.3%, 218.3 days, 12.6 km), downstream (22.2%, 185.5 days, 3.4 km), and complex (44.4%, 157.8 days, 3.6 km). The walleye moved 1.5 km downstream in 248 days.

7.3 DISCUSSION: SPECIES

Since 1974, a total of 9,172 fish was tagged: 294 brown bullhead, 1,129 channel catfish, 2,646 rock bass, 4,048 smallmouth bass, 258 largemouth bass, and 797 walleye.

Brown bullhead

Since 1974, a total of 294 brown bullhead was tagged and 32 were recaptured (recovery rate 10.9%) (Table 7.3-1). No movement accounted for 43.8% of the returns, 3.1% traveled upstream (average distance traveled 1.0 km), 15.6% moved downstream (4.5 km), and 37.5% made complex movements (1.5 km). The proportions of mobile (18) and sedentary (14) individuals were not significantly different from one-half ($P \leq 0.05$).

Channel catfish

A total of 1,129 channel catfish was tagged since 1974 and 42 were recaptured (recovery rate 3.7%) (Table 7.3-1). No movement

accounted for 19.0% of the returns, 31.0% moved upstream (average distance traveled 8.0 km), 33.3% moved downstream (2.4 km), and 16.7% made complex movements (4.3 km). The proportions of channel catfish that moved (34) and did not move (8) were significantly different from one-half ($P \leq 0.05$).

Rock bass

A total of 2,646 rock bass was tagged since 1974 and 455 were recaptured (recovery rate 17.2%) (Table 7.3-1). No movement accounted for 54.1% of the returns, 18.0% moved upstream (average distance traveled 11.2 km), 11.6% moved downstream (1.4 km), and 16.3% made complex movements (6.8 km). The proportions of sedentary (246) and mobile (209) individuals were not significantly different from one-half ($P \leq 0.05$).

The chi-square test was applied to 6 by 3 contingency tables to determine if type of movement and distance moved were independent of season (Tables 7.3-2 and 7.3-3). The calculated chi-square for type of movement and season (10.39) was below the critical value (18.31; $P \leq 0.05$; degrees of freedom, d.f. = 10), thus the null hypothesis that type of movement was independent of season was accepted. The calculated chi-square value comparing distances moved and season (27.53) was larger than the critical value; the null hypothesis that distance moved was independent of season of movement was rejected.

Of rock bass that moved (124) 59.3% were recaptured within 2.0 km of the tagging site (Table 7.3-3).

Smallmouth bass

A total of 4,048 smallmouth bass was tagged since 1974 and 295 were recaptured (recovery rate 7.3%) (Table 7.3-1). No movement comprised 55.6% of all smallmouth bass recaptured; 14.9% traveled upstream (average distance traveled 10.1 km), 12.9% moved downstream (1.3 km), and 16.6% made complex movements (1.6 km). The proportions of sedentary (164) and mobile (131) smallmouth bass were not significantly different from one-half ($P \leq 0.05$).

The chi-square test was applied to 5 by 3 contingency tables to determine if type of movement and distance moved were independent of season (Tables 7.3-4 and 7.3-5). The calculated chi-square comparing type of movement and season (8.98) was below the critical value (15.51; $P \leq 0.05$; d.f. = 8), thus the null hypothesis that type of movement was independent of season was accepted. The calculated chi-square comparing distance moved and season (19.92) was larger than the critical value; the null hypothesis that distance moved was independent of season of movement was rejected.

Of the smallmouth bass that moved (75) 57.3% were recaptured within 2.0 km of the tagging site (Table 7.3-5).

Largemouth bass

A total of 258 largemouth bass was tagged and 28 were recaptured since 1976 (recovery rate 10.9%) (Table 7.3-1). No movement accounted for 46.4% of the returns, 14.3% moved upstream (average distance traveled 6.2 km), 21.4% traveled downstream (16.8 km), and 17.9% made

complex movements (2.3 km). The proportions of sedentary (13) and mobile (15) individuals were not significantly different from one-half ($P \leq 0.05$).

Walleye

A total of 797 walleye was tagged and 43 were recaptured since 1975 (recover rate 5.4%) (Table 7.3-1). Only three walleye did not move; most (83.7%) moved upstream an average of 121.9 km, two moved downstream (2.6 km), and two made complex upstream movements out of the main stem of the Susquehanna River traveling an average of 318.1 km. The proportion of mobile (40) individuals was significantly different from one-half ($P \leq 0.05$).

7.4 DISCUSSION: DISTRIBUTION

The chi-square test was applied to a 6 by 3 contingency table (Table 7.3-6) to determine if the direction a fish moved was independent of species. The calculated chi-square (61.52) was much larger than the critical value (10.31, $P \leq 0.05$, d.f. = 10), leading to rejection of the hypothesis. Inspection of the observed and expected numbers in the cells indicated that the portion of chi-square contributed by upstream walleye movements (24.44) was enough to reject the null hypothesis. Large contributions to chi-square also were made by complex (9.66) and downstream (6.96) walleye movements and upstream (5.79) and complex (5.97) brown bullhead movements.

The 95% confidence limits (L_1 and L_2) for the nonparametric binomial test (Table 7.3-6) were used to test the hypothesis that

the proportions of each species making various movements were similar ($p = 1/3$). If the number of individuals of a species was less than L_1 or greater than L_2 , the proportions of individuals making that type of movement was significantly different from one-third ($P \leq 0.05$). Upstream and complex movements by brown bullhead; downstream movements by rock bass; and upstream, downstream, and complex movements by walleye were significantly different from one-third. For all species combined, the number of fish moving upstream was significantly greater than one-third, while the number moving downstream was significantly less than one-third. Apparently, fish tagged in York Haven Pond have a tendency to move upstream.

All rock bass and smallmouth bass recaptured since 1974 (including sedentary fish) were further tested by chi-square to determine if type of movement and distance moved were independent of species. The calculated chi-square in both instances (1.31: type of movement, 0.09: distance moved) were below the appropriate critical values leading to acceptance of the null hypothesis. This indicated that rock bass and smallmouth bass could be combined to determine if the probabilities of fish making various types of movement or moving various distances were similar for fish tagged in areas upstream and downstream of the TMINS Discharge. The chi-square test for differences in probabilities applied to a 2 by 4 contingency table (Table 7.3-7) comparing types of movements to upstream and downstream areas resulted in a chi-square value (3.67) less than the critical value (7.82, $P \leq 0.05$, d.f. = 3), leading to

acceptance of the null hypothesis. Similarly, the chi-square test applied to a 2 by 3 contingency table (Table 7.3-8) comparing distance moved to upstream and downstream areas resulted in a calculated chi-square value (2.24) less than the critical value (5.99, $P \leq 0.05$, d.f. = 2), leading to acceptance of the null hypothesis.

7.5 CONCLUSION

The majority of mobile brown bullhead recaptured since 1974 made complex movements; most walleye moved upstream. The proportions of fish that moved were not similar; there was a tendency for fish tagged in York Haven Pond to move upstream. This may be due to the presence of York Haven and Red Hill dams which act as partial barriers to downstream movements. Analysis of movements made by rock bass and smallmouth bass tagged in areas upstream and downstream of the TMINS Discharge indicated no differences in type of movement or distance moved by fish in these areas. The operation of TMINS since 1974 had little if any effect on movements of fishes tagged in its vicinity.

Table 7.1-1

Location of electrofishing zones sampled in York Haven Pond in 1982.

Station	Location
TM-AQF-15B2	Along west shore of reservoir, riffles to 500 m downstream.
TM-AQF-16B5	Along east and west shore Fall Island, riffles to south end.
TM-AQF-4A1	Along east shore TMI, north bridge to 500 m downstream.
TM-AQF-15A1	Along west shore Shelley Island, north end to 500 m downstream.
TM-AQF-15A2	Along east shore Shelley Island, north end to 500 m downstream.
TM-AQF-16A2	Along west shore TMI, north end to 500 m downstream.
TM-AQF-13A1	Along west shore TMI, boat dock to Discharge.
TM-AQF-10A3	Along west shore TMI, Discharge to 500 m downstream.
TM-AQF-9B5	Along west shore TMI, 1500 to 2000 m downstream from Discharge.
TM-AQF-10B3	Along east shore Shelley Island, opposite south end Beech Island to 500 m downstream.
TM-AQF-10B3	Along west shore Shelley Island, 500 m upstream to south end.
TM-AQF-11B1	Along west shore of reservoir from a small unnamed creek 500 m below the mouth of Fishing Creek downstream 500 m.

Table 7.1-2

Location of trapnet stations sampled in York Haven Pond in 1982.

Station	Location
TM-AQF-1A3	Southwest shore of St. Johns Island.
TM-AQF-11A2	West shore of TMI, 20 m downstream from Discharge.
TM-AQF-11A3	West shore of TMI, 200 m downstream from Discharge.
TM-AQF-9B2	West shore of TMI, 1900 m downstream from Discharge.

Table 7.1-3

Location of angler recaptures of tagged fishes in 1982.

Station	Location
TM-FM-1B1	East shore of York Haven Pond at the Tri-County Marina.
TM-FM-1B2	Susquehanna River about 0.4 km upstream of the Tri-County Marina.
TM-FM-1C2	Susquehanna River at Loyaltown, Pennsylvania.
TM-FM-1C3	Swatara Creek at Route 441 bridge in Middletown, Pennsylvania.
TM-FM-1C4	Swatara Creek at Hoffer Park in Middletown, Pennsylvania.
TM-FM-1D3	Swatara Creek at the Middletown Dam, Middletown, Pennsylvania.
TM-FM-7F1	Susquehanna River near Maytown, Pennsylvania.
TM-FM-8A2	East shore of Susquehanna River below Red Hill Dam.
TM-FM-8B1	Susquehanna River at Falmouth, Pennsylvania.
TM-FM-8C1	West shore of Susquehanna River below York Haven Dam at the mouth of Conewago Creek.
TM-FM-8F2	Susquehanna River at southern end of Brunner Island, York Haven, Pennsylvania.
TM-FM-8F3	Susquehanna River at Bainbridge, Pennsylvania.
TM-FM-9C1	Above York Haven Dam near the race for York Haven Generating Station.
TM-FM-10A1	East shore of Beech Island.
TM-FM-10A3	West shore of TMI, 300-1000 m downstream from Discharge.
TM-FM-10C2	Along west shore of York Haven Pond near Cly, Pennsylvania.
TM-FM-11A2	TMINS Discharge.
TM-FM-11B1	West shore of York Haven Pond at the mouth of a small unnamed creek below Conrad's Marina Basin.
TM-FM-11B2	West shore of York Haven Pond opposite north end of Bashore Island.
TM-FM-12B1	Fishing Creek in Goldsboro, Pennsylvania between railroad bridge and Route 262 bridge.
TM-FM-14A2	East shore of Shelley Island opposite TMINS.
TM-FM-14B1	West shore of York Haven Pond at PA Fish Commission access area.
TM-FM-15A2	Northwest shore of Shelley Island.
TM-FM-15B4	West shore of York Haven Pond at riffles (beginning of electrofishing Zone 15B2).
TM-FM-15C2	Susquehanna River at Sassafras Island, Middletown, Pennsylvania.
TM-FM-15F3	Susquehanna River about 0.4 km upstream from the mouth of the Yellow Breeches Creek, New Cumberland, Pennsylvania.
TM-FM-15F5	Susquehanna River at New Cumberland Fishing and Boat Club, New Cumberland, Pennsylvania.
TM-FM-15G4	Susquehanna River below Dock Street Dam, Harrisburg, Pennsylvania.
TM-FM-16A2	Northwest shore of TMI.
TM-FM-16B2	West shore of Fall Island.
TM-FM-16B3	East shore of Hill Island.
TM-FM-16B5	Between Fall Island and Tri-County Marina.
TM-FM-16H5	Susquehanna River about 0.5 km upstream from Liverpool, Pennsylvania.

Table 7.2-1

Number of fishes tagged each month near TMINS and gear used in 1982.

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<u>TRAPNET</u>											
Brown bullhead	-	-	3	10	-	-	-	-	1	-	14
Channel catfish	1	3	4	5	1	4	5	-	17	11	51
Rock bass	1	9	4	8	-	8	14	9	13	8	74
Smallmouth bass	-	3	-	-	-	-	-	-	-	-	3
Largemouth bass	-	1	-	-	-	-	1	2	1	-	5
<u>ELECTROFISHER</u>											
Brown bullhead	-	-	2	-	-	-	-	-	-	-	2
Channel catfish	4	3	2	1	3	4	10	2	4	3	36
Rock bass	17	49	17	22	8	18	33	69	77	68	376
Smallmouth bass	10	20	46	66	12	27	41	64	51	33	370
Largemouth bass	-	2	3	2	4	2	6	12	16	2	49
Walleye	-	-	-	-	-	-	2	1	2	3	8
<u>MET-ED ELECTROFISHER</u>											
Channel catfish	-	-	-	-	71	-	-	-	-	-	71
Rock bass	-	-	-	-	26	-	-	-	-	-	26
Smallmouth bass	-	-	-	-	53	-	-	-	-	-	53
Walleye	-	-	-	-	27	-	-	-	-	-	27
<u>TOTAL</u>											
Brown bullhead	-	-	5	10	-	-	-	-	1	-	16
Channel catfish	5	6	6	6	75	8	15	2	21	14	158
Rock bass	18	58	21	30	34	24	47	78	90	76	476
Smallmouth bass	10	23	46	66	65	27	41	64	51	33	426
Largemouth bass	-	3	3	2	4	2	7	14	17	2	54
Walleye	-	-	-	-	27	-	2	1	2	3	35
<u>TOTAL</u>	<u>33</u>	<u>90</u>	<u>81</u>	<u>114</u>	<u>205</u>	<u>61</u>	<u>112</u>	<u>159</u>	<u>182</u>	<u>128</u>	<u>1165</u>

Table 7.2-2

Number of fishes recaptured each month by various gear types in 1982.

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<u>TRAPNET</u>												
Brown bullhead	-	-	-	1	1	-	1	-	-	-	-	3
Channel catfish	-	-	1	-	-	-	1	-	1	-	-	4
Rock bass	-	-	4	1	3	-	-	-	-	1	1	10
Smallmouth bass	-	-	-	1	-	-	-	-	-	-	-	1
<u>ELECTROFISHER</u>												
Rock bass	-	-	2	2	2	2	-	3	10	6	5	32
Smallmouth bass	-	-	-	1	4	-	1	-	4	3	1	17
Largemouth bass	-	-	-	-	-	1	-	-	-	-	-	1
<u>MET-ED ELECTROFISHER</u>												
Rock bass	-	-	-	-	-	1	-	-	-	-	-	1
<u>ANGLER</u>												
Brown bullhead	-	-	1	-	-	1	-	-	-	-	-	2
Channel catfish	1	-	1	-	-	1	1	1	-	-	-	5
Rock bass	-	1	1	8*	2	3	1	-	1	-	-	17
Smallmouth bass	-	-	5	7	2	3	-	-	1	1	-	19
Largemouth bass	-	-	-	-	1	-	-	-	-	1	-	2
Walleye	-	-	-	-	1	1	-	-	-	-	-	2
<u>TOTAL</u>												
Brown bullhead	-	-	1	1	1	1	1	-	-	-	-	5
Channel catfish	1	-	2	-	-	1	2	1	1	-	-	9
Rock bass	-	1	7	11	7	6	1	3	11	7	6	60
Smallmouth bass	-	-	5	12	6	3	1	-	5	4	1	33
Largemouth bass	-	-	-	-	1	1	-	-	-	1	-	3
Walleye	-	-	-	-	1	1	-	-	-	-	-	2
<u>TOTAL</u>	<u>1</u>	<u>1</u>	<u>15</u>	<u>24</u>	<u>16</u>	<u>13</u>	<u>5</u>	<u>4</u>	<u>17</u>	<u>13</u>	<u>7</u>	<u>116</u>

* Includes one specimen gill netted by the Philadelphia Academy of Natural Sciences' program.

Table 7.2-3

and recapture histories of fishes recaptured in 1982. Gear abbreviations are: TN, trapnet; E, Electrofisher; ME, Metropolitan Edison Company shocking; F, Angler; and GN, Gill Net (Academy of Natural Sciences, Philadelphia, Pennsylvania).

Tag No.	Total Length (mm)	Weight (g)	Area Tagged	Date Tagged	Gear	Date Recaptured	Area	Gear	Fork Length (mm)	Weight (g)	Days Out	Distance Moved (km)	Movement*
Brown bullhead													
06704	255	228	11A3	23 Sep 80	T4	3 Jul 82	8B1	F	-	-	648	3.0	D** +
06726	342	720	1A3	22 May 81	TN	18 May 82	1A3	TN	350	724	361	0	-
06729	257	220	9B2	4 Nov 81	TN	17 Apr 82	7F1	F	-	-	164	15.3	D** +
06741	322	520	9B2	4 May 82	TN	3 Aug 82	9B2	TN	320	415	91	0	-
06413	245	280	9B2	3 Jun 82	TN	24 Jun 82	9B2	TN	250	280	21	0	-
Channel catfish													
06282	420	907	11A2	8 Oct 81	TN	23 Apr 82	11A2	TN	420	851	197	0	-
06467	526	1843	11A2	3 Sep 82	TN	6 Oct 82	11A3	TN	523	1673	33	0.2	D
						5 Nov 82	11A3	TN	526	1701	30	0	-
06404	475	1616	9B4	20 Oct 81	E	14 Apr 82	11B2	F	-	-	176	2.1	C
06465	440	852	10B1	28 Oct 81	E	6 Feb 82	8F2	F	-	-	101	8.2	D** +
06577	397	773	15B2	23 Mar 82	F	15 Jul 82	14B2	F	-	-	114	0.5	D
06805	444	-	9C1	20 Jul 82	ME	29 Aug 82	15B2	F	-	-	40	6.0	U
06878	266	-	9C1	20 Jul 82	ME	3 Aug 82	11A2	TN	279	263	14	3.2	U
06860	264	-	9C1	20 Jul 82	ME	3 Sep 82	8F3	F	-	-	45	5.6	D** +
Rock bass													
06676	201	-	9C1	11 Jul 78	ME	15 Jul 82	16B3	F	-	-	1465	5.0	U
06209	188	170	11A2	24 Apr 81	TN	15 Apr 82	11A3	TN	206	226	356	0.2	D
						13 May 82	10A4	GN	215	220	28	0.5	D
06221	214	250	1A3	21 May 81	TN	7 Mar 82	1C3	F	-	-	290	3.4	C +
06233	186	130	11A3	17 Jun 81	TN	23 Apr 82	11A3	TN	190	130	310	0	-
06258	192	154	11A3	23 Sep 81	TN	18 May 82	15A2	F	-	-	237	1.0	C
06292	173	113	11A2	21 Oct 81	TN	30 May 82	10A1	F	-	-	221	0.5	C
06306	213	240	11A2	21 Oct 81	TN	16 Apr 82	9B2	TN	212	224	177	1.9	D
06320	192	189	11A2	22 Oct 81	TN	16 Apr 82	11A2	TN	192	177	176	0	-
06331	161	91	11A2	4 Nov 81	TN	1 May 82	11A2	TN	160	88	182	0	-
06348	182	143	11A3	17 Nov 81	TN	20 Jul 82	9C2	ME	188	-	245	3.0	D** +
06396	163	105	1A3	5 May 82	TN	15 May 82	1C4	F	-	-	10	4.0	C +
06398	195	149	11A3	18 May 82	TN	26 Jun 82	1C4	F	-	-	24	5.2	C +
						25 Jun 82	11A2	TN	181	140	22	0.2	U
06415	185	148	11A3	3 Jun 82	TN	21 Sep 82	10A3	E	212	215	18	0	-
06430 ²	208	218	11A3	3 Sep 82	TN	4 Oct 82	10A3	E	214	227	13	0	-
06461	180	135	1A3	16 Sep 82	TN	18 Oct 82	16A2	E	184	126	32	0.3	D
06504	172	130	11A2	18 Nov 82	TN	7 Dec 82	10A3	-	173	128	19	0	-
06039	215	249	15B2	11 Jun 81	E	8 May 82	1C2	F	-	-	331	2.7	C +
06233 ²	209	200	16B8	9 Sep 81	E	12 Oct 82	10A3	E	190	126	398	2.4	D
06285	173	120	15A1	21 Sep 81	E	3 Jun 82	15A1	E	176	151	255	0	-
06319	175	125	4A1	5 Oct 81	E	20 Apr 82	8A2	F	-	-	197	1.6	D +
06321	195	183	16A2	5 Oct 81	F	25 May 82	16A2	E	195	170	232	0	-
06333	200	204	15A2	7 Oct 81	E	15 May 82	1D3	F	-	-	220	6.3	C +
06365	193	178	16A2	14 Oct 81	E	6 Dec 82	16A2	E	194	168	418	0	-
06409	159	86	10A3	21 Oct 81	E	24 Jun 82	11A2	TN	176	127	246	0	-
06435	171	117	15B2	28 Oct 81	E	12 Apr 82	15B2	E	170	108	166	0	-
06436	157	82	15B2	28 Oct 81	E	2 Jun 82	14B1	F	-	-	217	0.5	D
06458	171	110	15A1	28 Oct 81	E	26 May 82	15A1	E	172	109	210	0	-
06502	167	170	16B8	4 Nov 81	E	16 Jul 82	16B8	F	-	-	254	64.7	U +
06533	161	84	15B2	17 Nov 81	E	12 Apr 82	15B2	E	157	79	146	0	-
06581	232	300	15B2	23 Mar 82	E	17 Jun 82	15B2	E	239	340	86	0	-
06583	205	200	15B2	23 Mar 82	E	15 May 82	15F3	F	-	-	53	11.9	U +
06596	191	158	15B2	31 Mar 82	E	18 May 82	15G4	F	-	-	48	14.5	U +
06638	214	217	16B8	12 Apr 82	E	4 Aug 82	16B5	F	-	-	114	0.2	C
06744	205	210	16B8	25 May 82	E	7 Jul 82	15F5	F	-	-	43	11.9	U +
06821	162	90	16A2	23 Jun 82	E	27 Jul 82	16A2	E	168	113	34	0	-
06834	155	88	10A3	28 Jun 82	E	1 Jul 82	10A3	E	155	86	3	0	-
06905	170	127	15A1	23 Aug 82	E	9 Sep 82	15A1	E	171	133	17	0	-
06916 ²	175	136	13A1	25 Aug 82	E	5 Oct 82	13A1	E	175	125	41	0	-
06918	169	120	13A1	25 Aug 82	E	1 Nov 82	16A2	E	173	110	68	0.5	U
06930	162	97	15B2	9 Sep 82	E	2 Dec 82	15B2	E	165	117	84	0	-
06947	159	87	4A1	9 Sep 82	E	27 Sep 82	4A1	E	151	90	18	0	-
						14 Oct 82	4A1	E	166	93	17	0	-
06949	156	86	4A1	9 Sep 82	E	14 Oct 82	4A1	E	156	83	35	0	-
						1 Nov 82	4A1	E	156	76	18	0	-

Table 7.2-3 continued.

Tag No.	Fork Length (mm)	Weight (g)	Area Tagged	Date Tagged	Gear	Date Recaptured	Area	Gear	Fork Length (mm)	Weight (g)	Days Out	Distance Moved (km)	Movement*
08986	171	101	13A1	21 Sep 82	E	18 Nov 82	11A2	TN	173	104	58	0.3	D
08989	194	181	15A2	23 Sep 82	E	21 Oct 82	15A2	E	195	169	28	0	-
08997	197	181	15A1	23 Sep 82	E	2 Oct 82	1C3	F	-	-	9	4.1	C +
10019	159	90	4A1	4 Oct 82	E	14 Oct 82	4A1	E	160	93	10	0	-
10028	166	95	10B1	5 Oct 82	E	7 Dec 82	10B1	E	167	110	63	0	-
10047	166	96	15A1	7 Oct 82	E	21 Oct 82	15A1	E	167	110	14	0	-
						6 Nov 82	15A1	E	170	111	46	0	-
10120	182	136	15A1	21 Oct 82	E	2 Nov 82	15A1	E	181	135	12	0	-
10135	176	108	10A3	26 Oct 82	E	27 Oct 82	10A3	E	176	111	1	0	-
10136	161	83	10A3	26 Oct 82	E	1 Nov 82	10A3	E	163	80	6	0	-
10149	180	140	16A2	27 Oct 82	E	1 Nov 82	13A1	E	180	136	5	0.5	D
10150	179	123	16A2	27 Oct 82	E	2 Dec 82	1A3	TN	179	110	36	0.3	U
10165	180	122	9B4	27 Oct 82	E	1 Nov 82	9B5	E	180	125	5	0.5	D
Smallmouth bass													
08306	283	340	16A2	30 Sep 81	E	14 Oct 81	16A2	E	284	402	14	0	-
						5 May 82	8A2	F	-	-	203	2.5	C** +
08360	240	196	4A1	14 Oct 81	E	25 Apr 82	8B1	F	-	-	193	3.5	D** +
08371	208	120	10A3	14 Oct 81	E	17 May 82	10A3	E	210	132	215	0	-
08407	238	216	10A3	21 Oct 81	E	5 May 82	10A3	E	235	170	196	0	-
						14 Jun 82	10A3	E	233	155	40	0	-
						21 Jun 82	10A3	E	232	153	7	0	-
08420	235	167	16A2	22 Oct 81	E	24 Jun 82	16A2	E	239	225	245	0	-
08423	225	164	10A3	22 Oct 81	E	14 Jul 82	15C2	F	-	-	265	5.0	U +
08427	248	222	15B2	28 Oct 81	E	29 Apr 82	15G4	F	-	-	183	15.2	U +
08460	235	215	15A2	28 Oct 81	E	23 May 82	15G4	F	-	-	207	17.7	U +
08479	244	200	10B3	28 Oct 81	E	24 Apr 82	8C1	F	-	-	178	3.4	D** +
08505	330	589	16A2	4 Nov 81	E	18 Apr 82	8A2	F	-	-	165	2.5	C** +
08509	214	144	16A2	4 Nov 81	E	14 May 82	1D3	F	-	-	191	6.4	C +
						21 May 82	1D3	F	-	-	7	0	-
08522	247	232	10A3	10 Nov 81	E	14 Jun 82	10A3	E	246	234	216	0	-
08543	285	350	16B8	17 Nov 81	E	25 Apr 82	16B2	F	-	-	159	0	-
08571	338	671	10D1	3 Dec 81	E	3 May 82	1C2	F	-	-	151	5.2	U +
08575	360	860	15B2	23 Mar 82	E	3 Jun 82 ¹	12B1	F	-	-	72	3.0	C +
08604	293	400	16A2	31 Mar 82	E	19 May 82 ²	9B2	TN	-	-	49	2.6	D
08635	237	180	16B8	12 Apr 82	E	2 May 82	1B2	F	-	-	20	0.5	C
08669	227	162	16B8	21 Apr 82	E	25 May 82	16B8	E	231	190	36	0	-
08693	227	146	16B8	3 May 82	E	15 Jul 82	16B3	F	-	-	73	0.3	C
08694	225	208	16B8	3 May 82	E	16 May 82	14A2	F	-	-	13	1.8	U
08703	210	115	4A1	3 May 82	E	25 May 82	4A1	E	215	140	22	0	-
08725	218	145	10A3	5 May 82	E	7 Oct 82	11A2	F	-	-	155	0	-
08773	268	297	9B5	14 Jun 82	E	19 Jun 82	10A1	F	-	-	5	1.0	C
08833	201	118	16A2	28 Jun 82	E	11 Jul 82	16A2	F	-	-	13	0	-
08863	201	125	15A2	21 Jul 82	E	12 Aug 82	15A2	E	200	104	22	0	-
08881	203	124	16A2	9 Aug 82	E	26 Oct 82	16A2	E	202	103	78	0	-
08933	254	235	16B8	9 Sep 82	E	27 Oct 82	16B8	E	257	236	48	0	-
08980 ²	214	138	16B8	23 Sep 82	E	7 Oct 82	16B8	E	215	141	14	0	-
08994	230	179	15A1	23 Sep 82	E	21 Oct 82	15A1	E	230	177	28	0	-
08995	210	129	15A1	23 Sep 82	E	16 Nov 82	15A1	E	200	130	54	0	-
10027	206	130	16B3	5 Oct 82	E	15 Nov 82 ¹	1B1	F	-	-	41	4.0	C
10083	207	125	16B8	21 Oct 82	E	16 Nov 82	16B8	E	207	131	26	0	-
10159	205	124	10A3	27 Oct 82	E	7 Dec 82	10A3	E	205	124	41	0	-
10170	207	136	16B8	1 Nov 82	E	16 Nov 82	16B8	E	205	145	15	0	-
Largemouth bass													
03328	260	270	11B1	7 Oct 81	E	9 Jun 82	11B1	F	-	-	245	0	-
08795	253	284	11B1	21 Jun 82	E	14 Jul 82	11B1	E	263	305	23	0	-
10247	238	214	11B1	2 Nov 82	E	26 Nov 82	10C2	F	-	-	24	1.6	D
Walleye													
08373	373	589	4A1	15 Oct 81	E	20 Jun 82	8A2	F	-	-	248	1.5	D** +
09723	320	-	9C1	19 Jul 82	ME	19 Jul 82 ³	9C1	F	-	-	0	0	-

* Movements are classified as no movement (+), upstream (U), downstream (D), and complex (C).

** Moved downstream over York Haven or Red Hill dams.

+ Moved out of York Haven Pond.

1 Approximate recapture date from postmark.

2 Sacrificed for radiation analysis.

3 Found dead along shore.

Table 7.2-4

Number of tagged fish recovered in relation to calendar year after tagging. This table shows only the number of tags recovered in each calendar year, and does not consider multiple recaptures.

Year Fish Tagged	Calendar Year After Tagging				
	0	1	2	3	4
1974					
Channel catfish	1	3	*	*	*
Rock bass	22	38	2	2	1
Smallmouth bass	23	12	*	*	*
Total	47	53	2	2	1
1975					
Brown bullhead	2	2	2	*	*
Channel catfish	5	*	*	*	*
Rock bass	20	5	4	*	*
Smallmouth bass	8	*	*	*	*
Total	35	7	6	0	0
1976					
Brown bullhead	1	2	*	*	*
Channel catfish	1	2	*	*	*
Rock bass	31	24	4	*	*
Smallmouth bass	23	18	*	*	*
Largemouth bass	2	*	1	*	*
Total	58	48	1	0	0
1977					
Brown bullhead	7	2	*	*	*
Channel catfish	1	2	*	*	*
Rock bass	48	14	2	1	*
Smallmouth bass	42	12	*	*	*
Largemouth bass	1	*	*	*	*
Helleys	6	3	*	*	*
Total	103	31	2	1	0
1978					
Brown bullhead	2	*	*	*	*
Channel catfish	6	2	*	*	*
Rock bass	11	5	*	*	1
Smallmouth bass	26	9	*	*	*
Largemouth bass	5	1	*	*	*
Helleys	15	5	*	*	*
Total	65	22	0	0	1
1979					
Brown bullhead	*	*	*	*	*
Channel catfish	*	*	*	*	*
Rock bass	1	*	*	*	*
Smallmouth bass	1	*	*	*	*
Largemouth bass	*	*	*	*	*
Helleys	12	1	*	*	*
Total	16	1	0	0	0
1980					
Brown bullhead	1	*	1	*	*
Channel catfish	2	3	*	*	*
Rock bass	45	42	*	*	*
Smallmouth bass	23	16	*	*	*
Largemouth bass	4	4	*	*	*
Helleys	2	*	*	*	*
Total	77	65	1	0	0
1981					
Brown bullhead	1	2	*	*	*
Channel catfish	4	3	*	*	*
Rock bass	30	22	*	*	*
Smallmouth bass	32	14	*	*	*
Largemouth bass	6	1	*	*	*
Helleys	1	1	*	*	*
Total	74	43	0	0	0
1982					
Brown bullhead	2	*	*	*	*
Channel catfish	5	*	*	*	*
Rock bass	31	*	*	*	*
Smallmouth bass	20	*	*	*	*
Largemouth bass	2	*	*	*	*
Helleys	1	*	*	*	*
Total	61	0	0	0	0

Table 7.2-5

Number of recaptures and movements of fishes within York Haven Pond in 1982.

Species	Total No. of Recaptures	No. and (%) making no movement		No. and (%) moving		No. and (%) making complex movements
		upstream	downstream	upstream	downstream	
Brown bullhead	3	3(100.0)	-	-	-	-
Channel catfish	7	2(28.6)	2(28.6)	2(28.6)	1(14.3)	1(14.3)
Rock bass	46	32(69.7)	4(8.7)	9(19.6)	3(6.5)	3(6.5)
Smallmouth bass	79	21(26.7)	1(1.3)	2(2.5)	4(5.1)	4(5.1)
Largemouth bass	3	2(66.7)	-	1(33.3)	-	-
Helleys	1	1(100.0)	-	-	-	-

Table 7.2-6

Number of recaptures and movements of fishes outside of Jock Haven Pond in 1982.

Species	Total No. of Recaptures	No. and (%) moving upstream	No. and (%) moving downstream	No. and (%) making complex movements
Brown bullhead	2	-	2(100.0)	-
Channel catfish	2	-	2(100.0)	-
Rock bass	12	4(33.3)	2(16.7)	4(33.0)
Smallmouth bass	8	3(37.5)	2(25.0)	4(50.0)
Walleye	1	-	1(100.0)	-

Table 7.3-1

Summary of movements made by recaptured brown bullhead, channel catfish, rock bass, smallmouth bass, largemouth bass, and walleye (1974 through 1982). Numbers in parentheses denote mean distance traveled (km).

Year	No. of Recaptures	No. not moving	No. moving	Movements		
				Upstream	Downstream	Complex
Brown bullhead						
1974	-	-	-	-	-	-
1975	4	-	-	-	-	-
1976	3	-	3	-	1(0.2)	2(0.9)
1977	13	4	9	1(1.0)	2(1.9)	6(1.3)
1978	5	2	3	-	-	3(2.5)
1979	-	-	-	-	-	-
1980	1	1	-	-	-	-
1981	1	-	1	-	-	1(1.0)
1982	5	3	2	-	2(9.3)	-
Total	32	14	18	1(1.0)	5(4.5)	12(1.5)
Channel catfish						
1974	1	-	1	-	1(2.7)	-
1975	4	1	3*	3(6.17)	3(1.4)	2(2.5)
1976	1	-	1	1(40.4)	-	-
1977	3	1	2	-	-	2(8.8)
1978	8	1	7	3(2.1)	3(1.1)	1(3.4)
1979	7	-	7	1(0.5)	1(0.0)	-
1980	2	1	1	1(0.7)	-	-
1981	7	2	5	2(10.4)	2(4.4)	1(2.0)
1982	9	2	7	2(4.6)	4(3.8)	1(2.1)
Total	42	8	34*	13(8.0)	14(2.4)	7(6.3)
Rock bass						
1974	26	21*	5	3(0.5)	2(0.6)	-
1975	66	39	27	11(4.7)	6(1.4)	12(5.8)
1976	39	23	16	9(5.3)	4(0.8)	3(0.6)
1977	87	42	45	19(13.4)	5(0.5)	25(1.7)
1978	37	17	20	6(11.7)	7(1.7)	7(8.8)
1979	9	1	8*	3(3.3)	4(3.1)	1(1.1)
1980	56	37*	19	8(5.5)	7(1.0)	4(3.3)
1981	75	34	41	19(21.1)	9(1.8)	13(21.8)
1982	60	32	28	8(13.0)	11(1.1)	9(3.0)
Total	455	246	209	82(11.2)	53(1.4)	74(6.8)
Smallmouth bass						
1974	25	21*	4	-	2(0.8)	2(0.3)
1975	30	8	22	4(10.1)	4(2.0)	4(1.5)
1976	24	19*	5	1(20.9)	1(0.0)	3(1.0)
1977	65	31	34	12(5.0)	12(1.0)	10(2.2)
1978	39	9	30*	9(11.2)	11(1.2)	10(1.7)
1979	10	3	7	3(6.1)	2(0.9)	2(0.5)
1980	26	17	9	3(6.2)	2(1.2)	4(1.2)
1981	49	35*	14	8(17.6)	-	6(1.3)
1982	37	21	16	4(10.8)	4(2.8)	8(2.3)
Total	295	164	131	45(10.3)	38(1.3)	49(1.6)
Largemouth bass						
1976	2	2	-	-	-	-
1977	1	-	1	1(0.5)	-	-
1978	7	5	2	2(10.6)	-	-
1979	1	-	1	-	1(0.5)	-
1980	4	1	3	-	-	3(2.5)
1981	10	3	7	1(3.0)	4(24.7)	2(1.8)
1982	5	2	3	-	1(1.8)	-
Total	28	13	15	4(6.2)	6(16.8)	5(2.3)
Walleye						
1975	-	-	-	-	-	-
1976	-	-	-	-	-	-
1977	4	-	4	4(27.4)	-	-
1978	16	-	16*	15(121.5)	1(3.6)	-
1979	17	-	17*	15(138.9)	-	2(318.1)
1980	3	2	1	1(268.2)	-	-
1981	1	-	1	1(106.0)	-	-
1982	2	1	1	-	1(1.5)	-
Total	43	3	40*	36(121.9)	2(2.6)	2(318.1)

* Significant at $P \leq 0.05$ (nonparametric binomial test).

Table 2.2-2

A 2 X 3 contingency table for season and type of movement by rock bass, 1974 through 1982. Brackets indicate seasons which were combined for chi-square analysis.

SEASON	TYPE OF MOVEMENT			TOTAL
	Upland	Downstream	Complex	
Winter	0	0	0	0
Winter-Spring	0	0	1	1
Spring	17	8	34	59
Spring-Summer	13	7	0	20
Summer	5	2	2	9
Summer-Fall	3	2	3	8
Fall	0	0	1	1
Fall-Winter	0	0	0	0
2 Seasons	28	17	28	73
1 Year	0	0	0	0
TOTAL	43	27	75	145

Table 2.3-2

A 2 X 3 contingency table for season and type of movement by smallmouth bass, 1974 through 1982. Brackets indicate seasons which were combined for chi-square analysis.

SEASON	TYPE OF MOVEMENT			TOTAL
	Upland	Downstream	Complex	
Winter	0	0	0	0
Winter-Spring	0	0	1	1
Spring	5	3	4	12
Spring-Summer	0	2	0	2
Summer	14	0	0	14
Summer-Fall	0	1	2	3
Fall	3	0	0	3
Fall-Winter	0	0	0	0
2 Seasons	18	17	19	54
1 Year	0	0	1	1
TOTAL	35	18	24	77

Table 2.3-3

A 2 X 3 contingency table for fishes that move and type of movement, 1974 through 1982. V_1 and V_2 denote lower and upper 95% confidence limits for the nonparametric binomial test.

SPECIES	TYPE OF MOVEMENT			TOTAL	V_1	V_2
	Upland	Downstream	Complex			
Rock bass	14	5	17*	36	1.00	8.92
Channel catfish	13	14	7	34	1.85	16.72
Rock bass	82	12*	74	209	56.31	83.02
Smallmouth bass	64	38	49	151	23.09	56.24
Largemouth bass	0	0	5	5	1.42	8.58
Hallibut	26*	2*	40	68	7.49	18.18
TOTAL	189*	127*	140	456	109.87	168.73

* Significant at $P \leq 0.05$.

Table 2.3-7

A 2 X 3 contingency table for movements by rock bass and smallmouth bass tagged at three areas upstream and downstream of the DMS Discharge.

AREA	No. Movement	Upland	Downstream	Complex	TOTAL
Upstream	104	19	20	20	59
Downstream	86	28	20	13	61
TOTAL	190	47	40	33	120

Table 2.3-8

A 2 X 3 contingency table for distance moved by rock bass and smallmouth bass tagged at three areas upstream and downstream of the DMS Discharge.

AREA	DISTANCE MOVED			TOTAL
	0.0-0.3 km	0.4-2.0 km	> 2.1 km	
Upstream	13	19	19	51
Downstream	10	16	24	50
TOTAL	23	35	43	101

Table 2.3-9

A 2 X 3 contingency table for season and distance moved by rock bass, 1974 through 1982. Brackets indicate seasons which were combined for chi-square analysis.

SEASON	DISTANCE MOVED			TOTAL
	0.0-0.3 km	0.4-2.0 km	> 2.1 km	
Winter	0	0	0	0
Winter-Spring	0	0	0	0
Spring	7	0	13	20
Spring-Summer	12	0	0	12
Summer	0	0	0	0
Summer-Fall	0	0	0	0
Fall	10	0	0	10
Fall-Winter	0	0	0	0
2 Seasons	18	0	13	31
1 Year	0	0	0	0
TOTAL	30	0	13	43

Table 2.3-1

A 2 X 3 contingency table for season and distance moved by smallmouth bass, 1974 through 1982. Brackets indicate seasons which were combined for chi-square analysis.

SEASON	DISTANCE MOVED			TOTAL
	0.0-0.3 km	0.4-2.0 km	> 2.1 km	
Winter	0	0	0	0
Winter-Spring	1	0	0	1
Spring	0	0	0	0
Spring-Summer	0	7	0	7
Summer	11	0	0	11
Summer-Fall	0	2	0	2
Fall	7	0	0	7
Fall-Winter	0	0	0	0
2 Seasons	0	14	0	14
1 Year	0	0	0	0
TOTAL	19	14	0	33

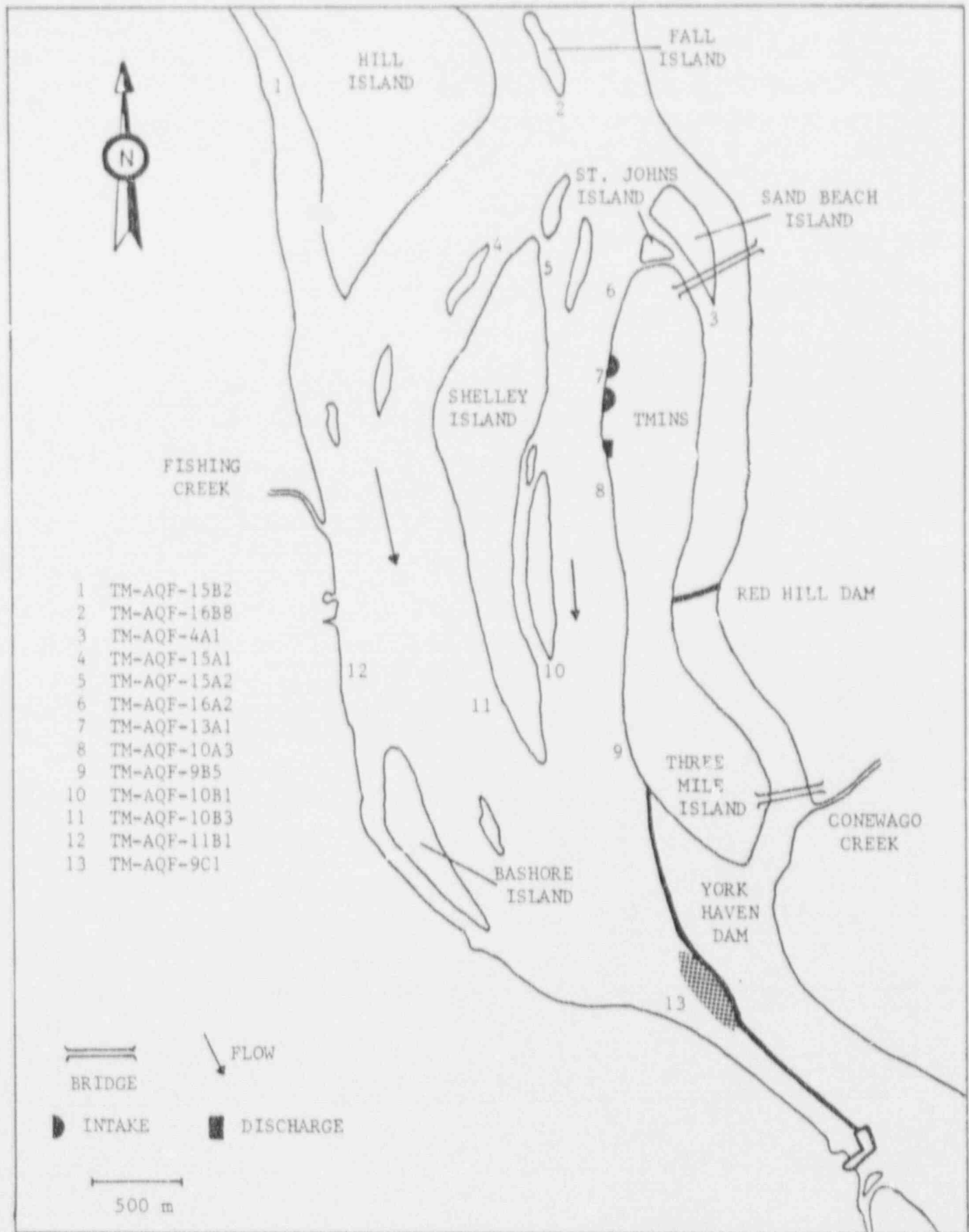


Figure 7.1-1. Location of electrofishing zones sampled in York Haven Pond. Shaded area denotes Metropolitan Edison Company release point.

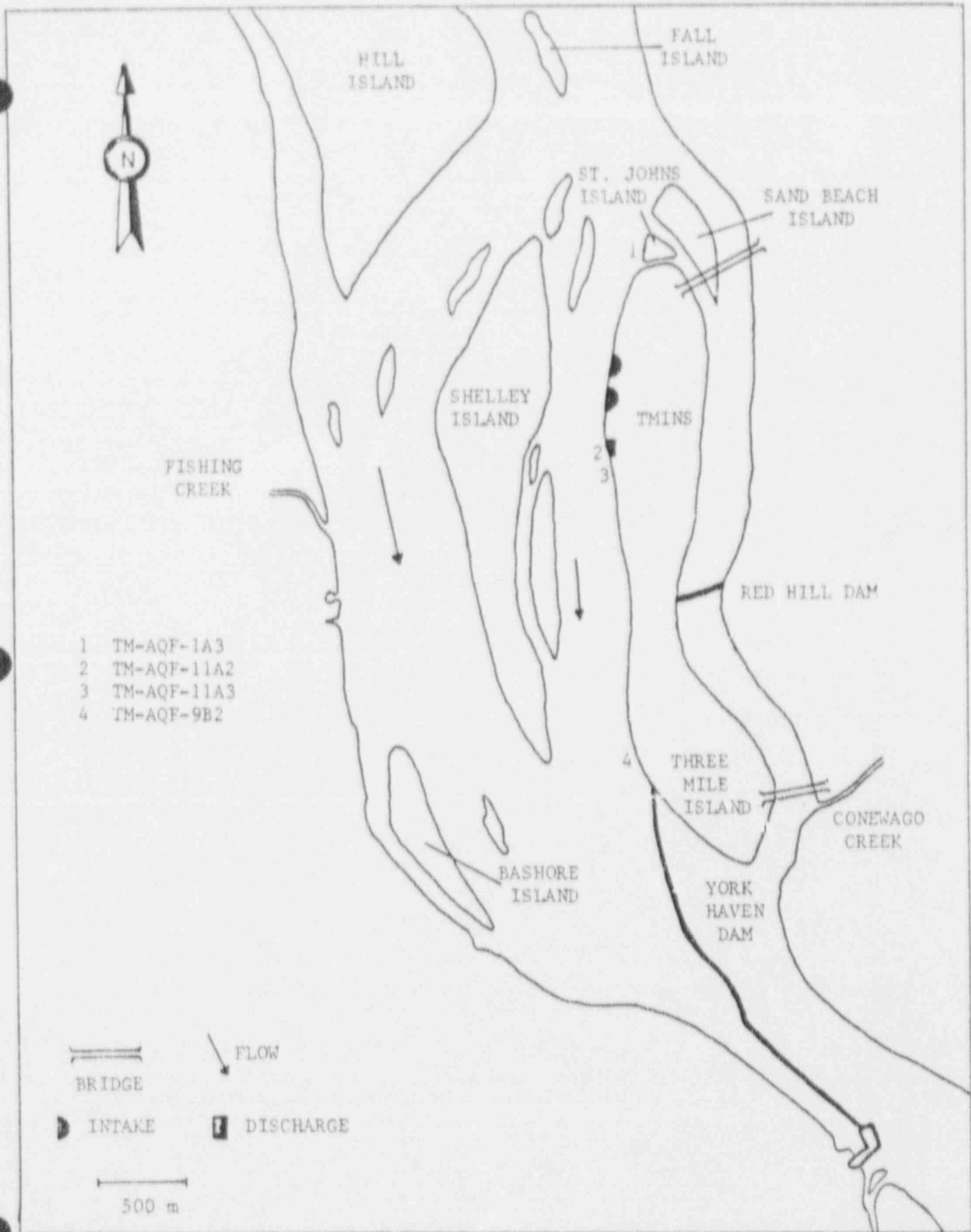


Figure 7.1-2. Location of trapnet stations sampled in York Haven Pond.

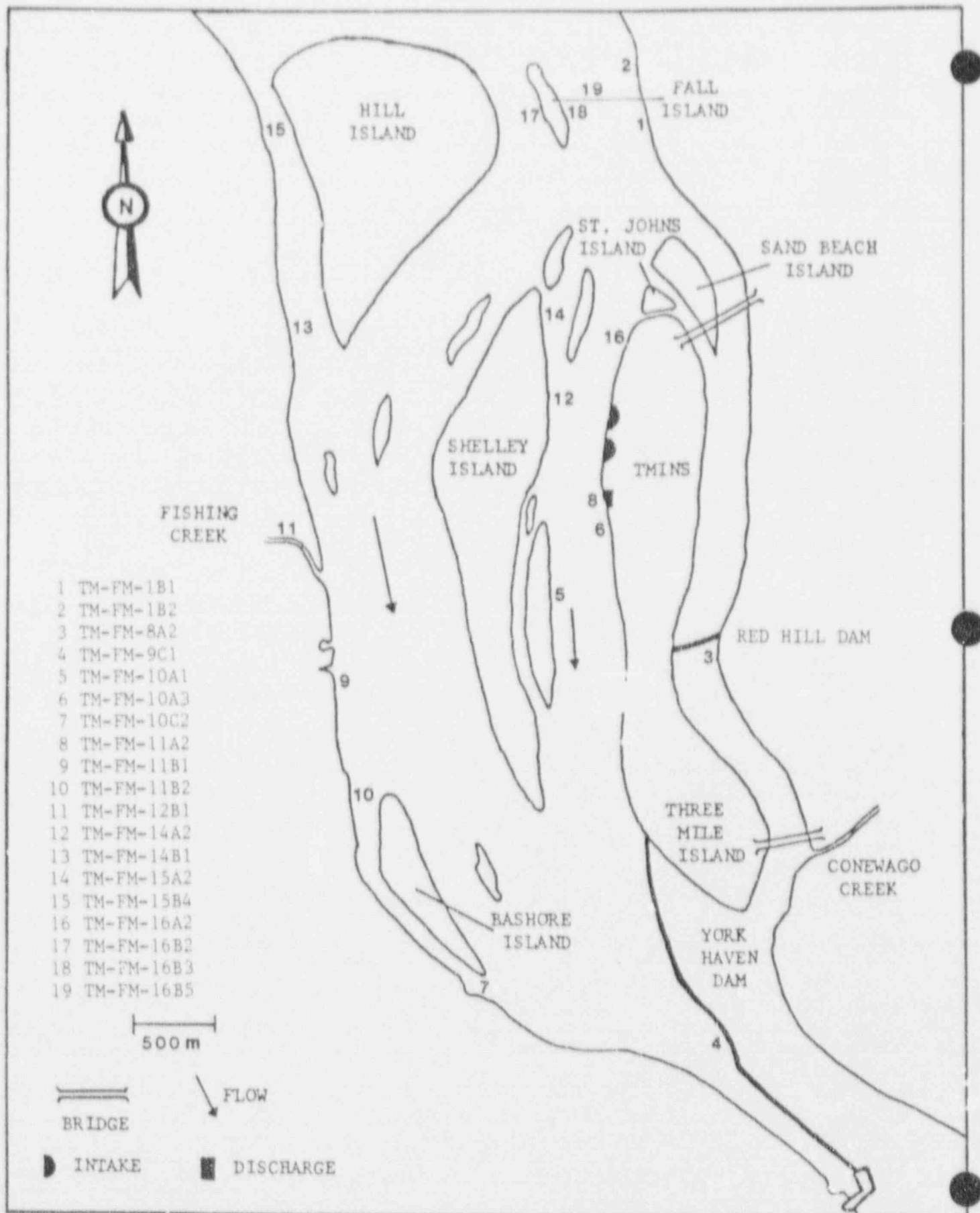


Figure 7.1-3. Location of angler recaptures near TMINS in 1982.

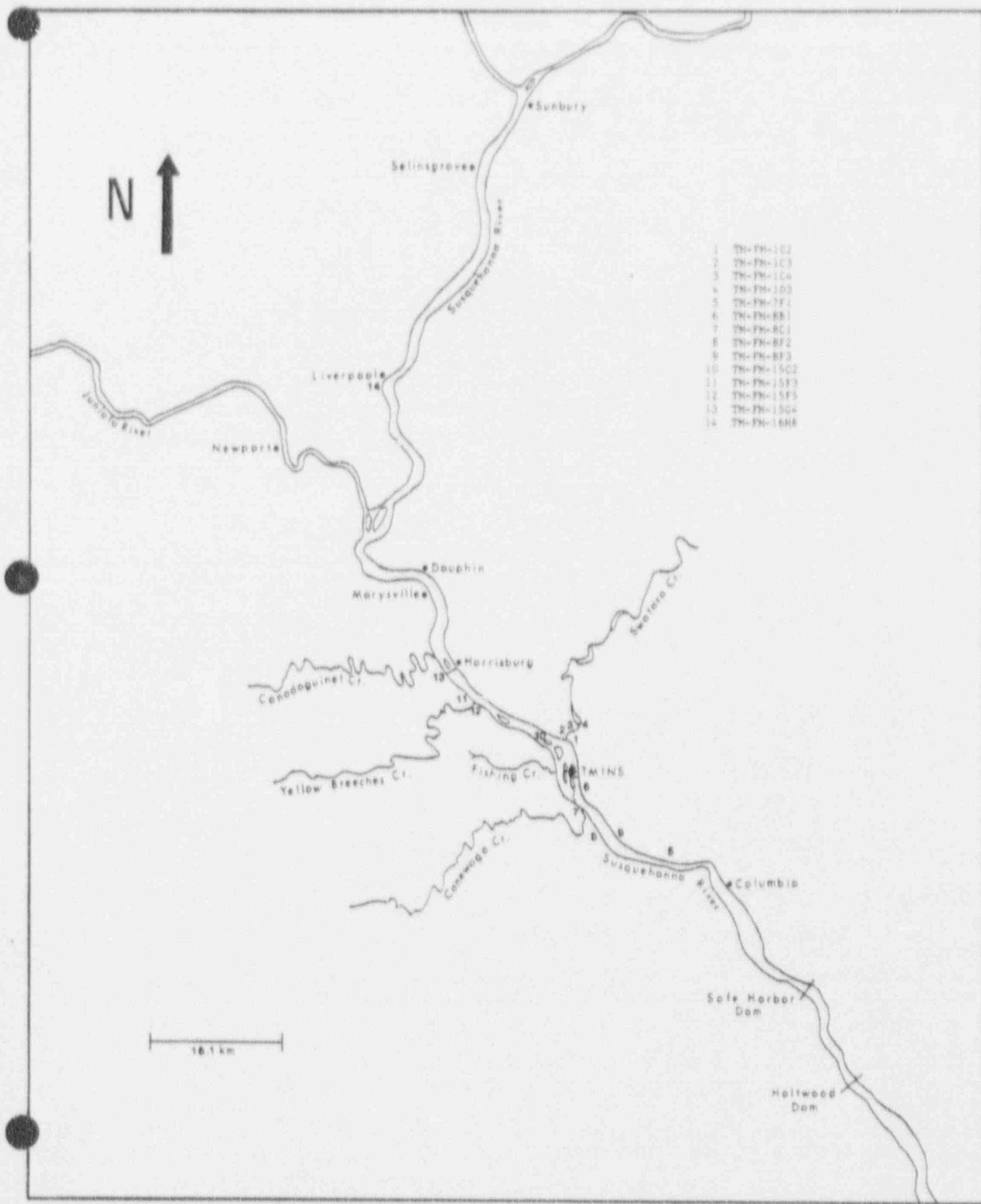


Figure 7.1-4. The Susquehanna River in Pennsylvania from Sunbury to the southern border; showing recapture sites of fish that moved out of York Haven Pond in 1962.

8.0 POPULATION ESTIMATES OF FISHES

Population estimates of rock bass, redbreast sunfish, pumpkinseed, bluegill, smallmouth bass, and walleye were made at four zones near TMINS in summer (23 June through 28 July) and/or fall (27 September through 1 November) 1982 to determine if differences in estimates occurred between zones upstream and downstream of the TMINS Discharge and sampling periods. Too few recaptures of other fishes were taken to compute valid estimates.

8.1 METHODS

A boat-mounted electrofisher (described in Section 6.3) was used. Summer and fall population estimates were made at four 500 m long zones (Table 8.1-1 and Figure 8.1-1). The physicochemical data recorded and method of collection were the same as those described in Section 6.3. At the end of each collection the catch was returned to the center of the zone, where each fish was identified, measured (to the nearest mm fork length, FL), weighed (to the nearest 1.0 g), and inspected for fin clips. Each unmarked specimen was marked with a half-fin clip; a different fin was clipped in each zone; and all fish were released after marking.

Population estimates were computed from the modified Schumacher-Eschmeyer formula (Ricker 1975).

Schumacher-Eschmeyer Population Estimate:

$$1/\hat{N} = \Sigma(M_t R_t) / \Sigma(C_t M_t^2)$$

Variance:

$$s^2 = \frac{\Sigma(R_t^2/C_t) - (\Sigma R_t M_t)^2 / \Sigma(C_t M_t^2)}{m-1}$$

Standard Error:

$$S.E. (1/\hat{N}) = \frac{\sqrt{s^2}}{\sqrt{\Sigma(C_t M_t^2)}}$$

Confidence Limits:

$$1/\hat{N} \pm t_{(m-1)} (S.E. 1/\hat{N})$$

where \hat{N} = estimated total number of fish in the population (N), M_t = total marked fish at the start of day "t" (the number of previously marked fish minus any deaths at the time of capture), C_t = total catch taken on day "t", R_t = number recaptured on day "t", m = number of samples, and $t_{(m-1)}$ = tabulated value from Student's t-Distribution ($P = 0.05$ and degrees of freedom = $m-1$).

The inverse form of the Schumacher-Eschmeyer formula was used, since it was more accurate to compute confidence limits for the more symmetrical distribution of $1/\hat{N}$ (Ricker 1975). Confidence limits of \hat{N} were found by inverting those obtained for $1/\hat{N}$. It should be noted that inversion produces asymmetrical confidence limits.

The calculation of population estimates assumed: (1) marked fish did not lose their marks (fin clips) during the study period; (2) marked individuals were randomly redistributed throughout the

population; (3) both marked and unmarked fish were equally susceptible to capture; (4) the numbers of fish entering the experiment were not increased as a result of recruitment from growth or immigration; (5) losses through death or emigration had the same proportion for both marked and unmarked fish; and (6) all marks were recognized and reported on recovery. To avoid statistical bias in the estimate at least three fish of the same species must be recaptured during the study period (Ricker 1975). Estimates with upper 95% confidence limits greater than triple the value of \hat{N} were considered invalid and were not included.

Population estimates were computed for smaller specimens of rock bass (<155 mm FL), smallmouth bass (<200 mm FL), and walleye (<275 mm FL). Larger specimens of these species were tagged for movement studies (described in Section 7.0).

Populations estimated at different zones during each sampling period and populations estimated in each zone during different sampling periods were compared by inspection of the 95% confidence limits. If the limits overlapped, the estimates were considered similar; if the limits did not overlap, the estimates were considered significantly different ($P \leq 0.05$).

The number of fish caught in each collection was divided by the duration of the collection (in minutes) to compute the number of fish per minute. Data from 13 population estimate sampling periods from fall 1975 through fall 1982 (no population estimates were conducted in 1979)

were used in a two factor analysis of variance (ANOVA) to determine if significant differences existed among zones and sampling period means. Population estimates for fall 1974 and summer 1975 were excluded from the ANOVA due to differences in zones sampled. Duncan's new multiple range test was used to compare means when the ANOVA indicated initial differences (Steel and Torrie 1960).

Kendall's measure of rank correlation, τ (Conover 1971) was used to determine if any correlations existed between the mean numbers of fish per minute and the estimated numbers of rock bass, redbreast sunfish, pumpkinseed, and walleye. The ranks of the estimated numbers of each species in each zone during each sampling period, when estimates were calculated, were compared to the corresponding ranks of the mean numbers of fish per minute. This method was also used to determine if any correlations existed between the ranks of the estimated numbers of redbreast sunfish and smallmouth bass (the most consistently estimated fishes) and the ranks of their total numbers in each zone during each sampling period, when an estimate was performed.

Differences in summer and fall mean river flow and water temperature for 1981 and 1982 were tested by Student's t-test (Sokal and Rohlf 1973).

8.2 RESULTS

Data from summer 1982 population estimate samples are summarized in Table 8.2-1; results of individual collections at each zone are presented in Tables 8.2-2 through 8.2-5. Fall 1982 samples are summarized in Table 8.2-6; results of individual collections are

presented in Tables 8.2-7 through 8.2-10. Population estimates and 95% confidence limits computed from 1974 through 1982 are presented in Table 8.2-11.

The rock bass population at Zone 16A2 was estimated in summer 1982 (Table 8.2-11); it was similar to all other estimates at 16A2 (Figure 8.2-1).

Redbreast sunfish populations were estimated at Zones 16A2 and 10A3 in summer 1982, and at 4A1 and 10A3 in fall 1982 (Table 8.2-11). Summer estimates at 16A2 and 10A3 were similar, as were fall estimates at 4A1 and 10A3 (Figure 8.2-2). The summer 1982 estimate at 16A2 was similar to summer 1977 and summer 1981, but significantly smaller than all other redbreast sunfish estimates at Zone 16A2. The summer 1982 estimate at 10A3 was significantly larger than the fall 1982 and summer 1978 estimates, but similar to all other estimates at Zone 10A3. The fall 1982 estimate at 10A3 was similar to summer 1976, summer 1978, and summer and fall 1981, and significantly smaller than other estimates at 10A3. The fall 1982 estimate at 4A1 was significantly smaller than the summer 1975 estimate, but similar to all other estimates at Zone 4A1.

Pumpkinseed populations were estimated at Zones 16A2 and 9B4 in summer 1982, and at 4A1 in the fall (Table 8.2-11). The summer 1982 estimate at 16A2 was significantly larger than the estimate at 9B4 (Figure 8.2-1). The fall 1982 estimate at 4A1 was significantly larger than summer 1978 and summer 1981 pumpkinseed estimates for that zone. The summer 1982 estimate at 16A2 was similar to all other pumpkinseed estimates at 16A2. The summer 1982 estimate at 9B4 was significantly smaller than the fall 1981 estimate.

The bluegill population was estimated for the first time in summer 1982 at Zone 10A3 (Table 8.2-11).

Smallmouth bass populations were estimated at Zones 16A2 and 10A3 in summer 1982, and at 16A2 in the fall (Table 8.2-11). The summer and fall estimates at all zones were similar (Figure 8.2-3). The summer 1982 estimate at 16A2 was significantly greater than fall 1974 and summer 1975; significantly smaller than fall 1977; and similar to all other estimates at that zone. The fall 1982 estimate at 16A2 was significantly larger than fall 1974; significantly smaller than fall 1977; and similar to all other smallmouth bass estimates at 16A2. The summer 1982 estimate at 10A3 was significantly larger than summer and fall 1975 and summer 1978, and similar to all other estimates at 10A3.

Walleye populations were estimated at Zones 16A2, 10A3, and 9B4 in fall 1982 (Table 8.2-11). All zones had similar walleye estimates in 1982 (Figure 8.2-4). Fall 1982 walleye estimates were similar to all previous estimates in the three zones.

The results of the two factor ANOVA comparing mean numbers of fish per minute at the population estimate zones are presented in Table 8.2-12. All factors were significant ($P \leq 0.05$). Sampling periods showed the largest difference ($F = 36.22$) followed by zones (13.42) and their interactions (3.90).

Duncan's new multiple range test was applied to the zone and sampling period means. Among zones, 16A2, 10A3, and 4A1 were similar

and significantly greater than 984 (Table 8.2-13). Among sampling periods, fall 1977 was significantly larger than all other periods, fall 1981 was significantly larger than the remaining 11 periods, and fall 1978 was significantly larger than the remainder (Table 8.2-14). The sampling period mean for summer 1980 was significantly larger than fall 1976, and both were significantly smaller than all other periods. The summer 1982 mean number of fish per minute (1.87) was larger than fall 1982 (1.60), but they were not significantly different.

8.3 DISCUSSION

Results of Kendall's τ correlations between mean numbers of fish per minute captured during each sampling period at each zone and population estimates of rock bass, redbreast sunfish, pumpkinseed, smallmouth bass, and walleye during each sampling period are presented in Table 8.3-1. Smallmouth bass estimates at Zones 16A2 and 10A3 were the only estimates positively correlated with mean fish per minute.

Mean number of fish per minute is a measure of the relative abundance of all fishes captured during each sampling period at each zone. Fish abundance does not necessarily insure large population estimates or even an estimate. Population estimates are computed for each species and they depend on both the number of fish captured and the number recaptured. If the number of recaptures for a species is low the upper confidence limit may be infinity, which makes the estimate meaningless.

Smallmouth bass in Zones 16A2 (11 estimates) and 10A3 (8) and redbreast sunfish in Zones 4A1 (9) and 10A3 (8) were the most frequently estimated populations during sampling from summer 1975 through fall 1982 (Table 8.2-11). The total numbers of these fishes captured in each zone during each sampling period, when an estimate was made, were compared to the estimated number of fish during each sampling period by Kendall's τ (Table 8.3-2). The redbreast sunfish and smallmouth bass total numbers were positively correlated with the estimated number during each sampling period at each zone.

The mean number of fish per minute during the summer 1982 (1.87) population estimates was larger than the fall (1.60); however, the means were not significantly different ($P \leq 0.05$) (Table 8.2-14). The summer 1982 mean was the largest summer mean to date; it was significantly larger than all other summer means.

Water temperature and river flow data were compared between summer 1982 and summer 1981, which had the third largest summer mean number of fish per minute (1.44), by Student's t-test. Mean water temperature during the summer 1982 (26.14 C) and summer 1981 (26.15 C) periods were similar. However, the mean river flow during summer 1982 (527.42 m³/s) was significantly greater than summer 1981 (367.07 m³/s) ($t = 2.29$, $P \leq 0.05$, d.f. = 24), due to heavy rainfall in May (1.13 inches above normal) and June (5.01) of 1982. During high river flow fish can occupy areas on the banks of TMI normally above the river level in June and July. These areas provide more cover in the form

of boulders and fallen trees than are normally available in most zones; this may explain the significantly larger mean number of fish per minute during summer 1982.

Conversely, the mean number of fish per minute found in fall 1982 (1.60) was significantly smaller than fall 1981 (3.09) (Table 8.2-14). Mean water temperature was similar during both sampling periods (1981:14.72, 1982:15.25, $t = 0.384$). A comparison of mean river flow during fall 1982 (149.42 m³/s) to fall 1981 (328.0 m³/s) indicated a significant difference ($t = 6.35$, $P \leq 0.05$, d.f. = 19) between the means. Low river flow during fall 1982 may have adversely affected the mean number of fish per minute during the population estimate period.

Table 8.1-1

Location and description of population estimate zones sampled in 1982.

Zone	Location and Description
TM-AQF-4A1	Along east shore of TMI, north bridge to 500 m downstream. Mud bottom, a few fallen trees and boulders. When the river ceases to flow over Red Hill Dam (river flow $<435 \text{ m}^3/\text{s}$) the current reverses and flows north through the zone. Extensive plankton blooms occur during the summer when river flow is low (river flow $<170 \text{ m}^3/\text{s}$).
TM-AQF-16A2	Along west shore of TMI, north tip to 500 m downstream. Bottom is characterized by many large boulders, rubble, and gravel. Emergent vegetation (water willow, <i>Justicia americana</i>) is common in patches along the shore. There is usually a strong current along the length of the zone except when river flow is low (river flow $<170 \text{ m}^3/\text{s}$).
TM-AQF-10A3	Along west shore of TMI, Discharge to 500 m downstream. The upper 200 m is shallow with a mud bottom and some patches of water willow. There is an eddy along shore caused by the Discharge. The lower 500 m has some boulders, rubble, and gravel on the bottom; some fallen trees are present.
TM-AQF-9B4	Along west shore of TMI, 1000 to 1500 m downstream from the Discharge. The upper 200 m of this zone is characterized by shallow mud flats and fallen trees. The rest of the zone has some rubble and gravel on the bottom; some boulders and fallen trees are also present.

Table 8.2-1

Summary of fishes captured at the four population estimate zones near TMINS in summer 1982. Numbers in parentheses denote recaptures.

Zone	TM-AQF-4A1	TM-AQF-16A2	TM-AQF-10A3	TM-AQF-9B4	TOTAL
No. of Collections	12	12	12	11	47
No. of Species	13	15	15	14	19
No. of Specimens	249	477	465	199	1390
Gizzard shad	6	-	-	1	7
Common carp	4	6	3	4	17
Golden shiner	1	1	1	-	3
Fallfish	-	1	-	-	1
Quillback	105	66	29	52	252
White sucker	-	41	16	2	59
Northern hog sucker	-	2	-	-	2
Shorthead redhorse	1	6	3	1	11
Channel catfish	3	-	10(1)	2	15(1)
Rock bass	4	54(5)	72(5)	20	150(10)
Redbreast sunfish	14(2)	40(7)	104(26)	19(4)	177(39)
Pumpkinseed	85(4)	140(14)	102(5)	28(4)	355(28)
Bluegill	6	6	25(4)	15	52(4)
Smallmouth bass	17(1)	102(12)	77(6)	38(1)	234(20)
Largemouth bass	1	-	-	-	1
White crappie	2	3	3	3	11
Black crappie	-	1	5	6	12
Yellow perch	-	-	1	-	1
Walleye	-	8	14(1)	8(1)	30(2)

Table 8.2-2

Numbers of fishes captured at Zone TM-AQP-4A1 during the summer, 1982. Numbers in parentheses denote recaptures.

Date	23 Jun	24 Jun	28 Jun	29 Jun	1 Jul	7 Jul	13 Jul	15 Jul	19 Jul	26 Jul	27 Jul	28 Jul	Total
Time	2119	2121	2117	2120	2124	2259	2131	2125	2117	2045	2055	2050	
Duration (min)	16	17	18	16	14	17	19	15	14	18	16	15	
Air Temp (C)	18.5	18.5	23.0	22.5	19.5	25.0	26.5	30.0	27.5	28.5	NA	25.5	
Water Temp (C)	21.5	22.5	25.0	25.0	24.0	26.0	28.0	30.5	30.5	30.0	29.0	26.0	
Dissolved Oxygen (mg/l)	9.0	12.2	10.4	9.5	11.0	10.0	NA	12.5	10.8	12.2	11.0	7.4	
pH	7.5	8.3	8.4	8.4	8.8	8.4	8.9	8.9	8.9	8.7	9.1	7.7	
Conductivity (micromhos/cm)	250	260	340	325	325	275	375	375	400	410	425	400	
Secchi Disc (cm)	51	51	66	58	46	45	86	81	61	36	64	25	
Volts	200	195	185	180	185	180	175	180	175	185	170	165	
Amps	4.5	4.0	7.0	7.0	7.0	6.5	7.5	8.0	9.0	7.5	7.0	7.0	
Gizzard shad	-	-	-	-	1	2	-	-	-	-	-	1	6
Common carp	2	-	-	-	-	-	-	1	-	-	-	-	4
Golden shiner	-	-	-	1	-	-	-	-	-	-	-	-	1
Oullback	-	-	45	7	3	2	2	5	-	16	5	20	105
Shorthead redhorse	1	-	-	-	-	-	-	-	-	-	-	-	1
Channel catfish	-	-	-	-	-	-	2	1	-	-	-	-	3
Rock bass	-	-	-	-	-	-	2	-	-	-	1	-	4
Redbreast sunfish	-	1	-	2	1(1)	-	4	-	5	1	-	2(1)	14(2)
Pumpkinseed	1	5	4(1)	7	4	5	21	10(2)	12	8(1)	2	6	85(4)
Bluegill	-	1	-	1	-	-	3	1	-	-	-	-	6
Smallmouth bass	1	3	3	-	-	2	4(1)	1	2	-	1	-	17(1)
Largemouth bass	-	-	-	-	-	-	-	-	-	1	-	-	1
White crappie	-	-	1	-	-	1	-	-	-	-	-	-	2
No. of Specimens	5	12	53	18	9	17	38	19	17	28	9	29	149
No. of Spec. is	4	3	4	5	4	5	7	6	3	4	4	4	13

Table 8.2-3

Numbers of fishes captured at Zone TM-AQP-16A2 during the summer, 1982. Numbers in parentheses denote recaptures.

Date	23 Jun	24 Jun	28 Jun	29 Jun	1 Jul	7 Jul	13 Jul	15 Jul	21 Jul	26 Jul	27 Jul	28 Jul	Total
Time	2148	2153	2150	2155	2151	2331	2216	2159	2230	2115	2127	2132	
Duration (min)	16	14	15	15	15	19	15	14	18	19	17	18	
Air Temp (C)	18.5	17.0	23.0	23.5	19.0	24.5	23.0	28.0	20.5	25.0	NA	25.5	
Water Temp (C)	21.5	22.0	25.0	25.0	24.5	25.5	28.5	30.0	27.0	29.0	28.0	25.5	
Dissolved Oxygen (mg/l)	8.8	10.6	10.2	9.7	10.6	10.0	NA	12.0	10.2	11.8	10.4	7.2	
pH	7.5	8.4	8.6	8.4	9.0	8.3	9.1	8.3	8.1	8.6	9.0	7.5	
Conductivity (micromhos/cm)	250	260	330	325	310	275	375	360	400	425	425	400	
Secchi Disc (cm)	38	46	61	64	46	41	64	58	51	30	58	20	
Volts	200	200	180	175	185	175	175	180	165	165	135	120	
Amps	5.0	6.5	7.0	7.0	7.0	6.5	8.0	9.0	7.0	8.0	7.0	4.5	
Common carp	-	1	-	-	1	-	-	-	-	3	-	1	6
Golden shiner	-	-	-	-	-	-	-	-	-	-	1	-	1
Fallfish	-	1	-	-	-	-	-	-	-	-	-	-	1
Oullback	1	-	-	1	-	1	1	1	10	20	19	12	66
White sucker	6	6	10	9	7	1	2	-	-	-	-	-	41
Northern hog sucker	-	-	1	-	-	-	-	1	-	-	-	-	2
Shorthead redhorse	2	-	-	-	-	4	-	-	-	-	-	-	6
Rock bass	8	5	6	3	8(1)	5	7(2)	2(1)	1	5	2	2(1)	54(5)
Redbreast sunfish	2	1	2	7	6	4	3(2)	4(2)	2(1)	7(1)	2(1)	-	40(7)
Pumpkinseed	15	7	13(1)	22	15(1)	9	13(4)	16(3)	5(1)	9(3)	4(1)	2	140(14)
Bluegill	-	-	1	-	1	1	1	1	1	1	-	-	6
Smallmouth bass	23	16	8(1)	9(2)	17(1)	9(1)	6(2)	1	3	6(3)	4(2)	-	102(12)
White crappie	-	-	-	1	-	-	-	-	1	-	1	-	3
Black crappie	-	-	-	-	-	1	-	-	-	-	-	-	1
Walleye	4	3	-	-	-	1	-	-	-	-	-	-	8
No. of Specimens	61	40	41	52	35	36	42	26	23	51	33	17	477
No. of Species	8	8	7	7	7	10	6	7	7	7	7	4	18

Table 8.2-4

Numbers of fishes captured at Zone TM-AQF-10A3 during the summer, 1982. Numbers in parentheses denote recaptures.

Date	23 Jun	24 Jun	28 Jun	29 Jun	1 Jul	13 Jul	14 Jul	15 Jul	22 Jul	26 Jul	27 Jul	28 Jul	Total
Time	2235	2236	2227	2240	2236	2328	2245	2232	2251	2155	2206	2205	
Duration (min)	19	14	16	15	15	18	18	14	16	18	16	15	
Air Temp (C)	18.0	18.0	22.5	22.5	20.0	24.0	25.5	26.0	24.0	25.0	NA	24.5	
Water Temp (C)	21.5	22.0	25.5	25.0	24.5	28.0	28.0	30.0	27.0	29.5	28.0	26.0	
Dissolved Oxygen (mg/l)	8.8	10.2	10.2	9.6	10.3	NA	10.6	10.5	10.0	11.4	9.9	7.4	
pH	7.6	8.3	8.7	8.6	8.4	9.2	8.5	8.7	8.5	8.6	9.0	7.4	
Conductivity (microhm/cm)	250	240	325	310	310	380	350	380	390	410	425	390	
Secchi Disc (cm)	46	46	61	61	46	58	61	66	36	36	61	25	
Volts	200	200	175	175	180	70	165	175	170	160	165	110	
Amps	4.5	6.5	7.0	6.5	7.0	7.5	7.5	9.0	7.0	7.5	6.0	3.0	
Common carp	-	-	-	-	-	-	-	-	-	2	1	-	3
Golden shiner	-	-	1	-	-	-	-	-	-	-	-	-	1
Quillback	-	1	1	1	2	1	2	-	3	11	4	3	29
White sucker	1	5	2	3	2	1	1	1	-	-	-	-	16
Shorthead redhorse	2	-	-	-	1	-	-	-	-	-	-	-	3
Channel catfish	-	-	-	-	-	-	-	-	1	7(1)	2	-	10(1)
Rock bass	6	15	7	5(2)	10(1)	3	5	2(1)	6	6(1)	4	3	72(5)
Redbreast sunfish	4	5	11(1)	5(2)	14(5)	10(1)	9(2)	8(3)	10(1)	18(6)	9(5)	1	104(26)
Pumpkinseed	9	9(2)	15	15(1)	9(1)	9	3	2	7	11(1)	6	5(1)	102(6)
Bluegill	1	3	3	1	1	1	1	-	6	2(1)	4(2)	1(1)	25(4)
Smallmouth bass	16	17(1)	8	7(1)	1	4(1)	-	5(2)	2	2	1	3	77(6)
White crappie	-	1	-	1	-	-	-	-	-	-	-	-	3
Black crappie	-	1	2	-	-	1	-	-	-	1	-	-	5
Yellow perch	-	1	-	-	-	-	-	-	-	-	-	-	1
Walleye	2	1	5(1)	3	-	1	-	-	1	-	1	-	14(1)
No. of Specimens	41	59	55	41	33	31	21	18	36	62	32	16	465
No. of Species	8	11	10	9	9	9	8	5	8	9	9	6	15

NA Not Available.

Table 8.2-5

Numbers of fishes captured at Zone TM-AQF-984 during the summer, 1982. Numbers in parentheses denote recaptures.

Date	23 Jun	24 Jun	28 Jun	29 Jun	1 Jul	14 Jul	14 Jul	15 Jul	22 Jul	26 Jul	28 Jul	Total	
Time	2316	2318	2312	2318	2318	0007	2324	2324	2337	2306	2302		
Duration (min)	14	13	14	16	14	17	17	17	14	22	16		
Air Temp (C)	16.5	15.0	23.0	24.0	19.0	23.5	24.5	27.5	24.0	27.0	24.0		
Water Temp (C)	21.5	22.0	25.0	25.0	23.0	28.0	28.0	29.5	26.0	28.0	26.0		
Dissolved Oxygen (mg/l)	8.8	10.2	10.0	9.6	10.0	NA	11.0	10.6	10.0	10.2	6.8		
pH	7.6	8.3	8.7	8.6	8.7	9.3	8.5	8.6	8.4	8.5	7.5		
Conductivity (microhm/cm)	250	275	325	310	310	376	350	360	390	425	375		
Secchi Disc (cm)	51	41	61	61	41	69	71	69	56	NA	25		
Volts	205	200	180	185	175	175	160	180	170	165	125		
Amps	4.5	6.5	7.0	7.5	6.5	8.0	7.5	9.0	7.0	6.0	5.0		
Clizzard shad	-	-	-	-	-	-	-	-	-	-	-	-	1
Common carp	-	-	-	-	-	-	-	-	-	-	-	-	4
Quillback	-	1	-	1	2	4	1	2	23	6	12	-	52
White sucker	-	-	1	-	1	-	-	-	-	-	-	-	2
Shorthead redhorse	1	-	-	-	-	-	-	-	-	-	-	-	1
Channel catfish	-	-	-	-	-	-	1	-	-	1	-	-	2
Rock bass	5	1	4	3	-	4	-	1	1	-	1	-	20
Redbreast sunfish	1	2	2	6(3)	2	3(1)	2	-	-	1	-	-	19(4)
Pumpkinseed	7	-	-	7	3	3(2)	5(2)	2	-	1	-	-	28(4)
Bluegill	3	-	8	-	-	-	-	-	-	4	-	-	15
Smallmouth bass	23	5	5	1	-	2(1)	-	-	1	1	-	-	38(1)
White crappie	-	-	-	1	-	-	-	1	1	-	-	-	3
Black crappie	-	1	1	-	3	1	-	-	-	-	-	-	6
Walleye	1	-	2	3	1(1)	-	-	-	-	1	-	-	8(1)
No. of Specimens	41	10	23	22	12	17	9	7	28	16	14	-	199
No. of Species	7	5	7	7	6	6	4	5	5	6	3	-	16

NA Not Available.

Table 8.2-6

Summary of fishes captured at the four population estimate zones near TMINS in fall 1982. Numbers in parentheses denote recaptures.

Zone	TM-AQF-4A1	TM-AQF-16A2	TM-AQF-10A3	TM-AQF-9B4	TOTAL
No. of Collections	12	12	12	11	47
No. of Species	17	17	13	18	22
No. of Specimens	477	260	304	236	1277
Bowfin	-	-	-	1	1
American shad	-	3	1	1	5
Gizzard shad	15	15	4	1	35
Muskellunge	3	1	-	-	4
Common carp	16	5	2	6	29
Golden shiner	-	-	-	3	3
Quillback	14	9	31	6	120
White sucker	4	8	4	2	18
Shorthead redhorse	2	1	-	3	6
Channel catfish	5	5	1	5	16
Margined madtom	-	1	-	-	1
Rock bass	31(1)	28	49(2)	20	128(3)
Redbreast sunfish	25(5)	13	29(7)	1	68(12)
Green sunfish	-	1	-	-	1
Pumpkinseed	271(11)	84(2)	82	48(3)	485(16)
Bluegill	17	3	6	-	26
<i>Lepomis</i> hybrid	1	-	-	-	1
Smallmouth bass	17	52(5)	42(1)	19	130(6)
Largemouth bass	21	-	-	1	22
White crappie	3	-	-	3	6
Black crappie	3	1	2	3	9
Yellow perch	5	-	-	3	8
Walleye	24	30(7)	51(13)	50(14)	155(34)

Table 8.2-7

Numbers of fishes captured in Zone TM-16A2 during the fall, 1982. Numbers in parentheses denote recaptures.

Date	27 Sep	28 Sep	29 Sep	30 Sep	1 Oct	6 Oct	12 Oct	14 Oct	18 Oct	26 Oct	27 Oct	1 Nov	Total
Time	1941	1931	1930	1935	1932	1910	1919	1908	1915	1848	1920	1834	
Duration (min)	18	16	17	15	16	17	15	16	16	17	18	17	
Air Temp (C)	15.3	17.5	17.0	16.0	20.0	20.0	4.5	14.0	9.5	10.0	9.0	13.0	
Water Temp (C)	17.0	17.0	17.5	18.0	19.0	20.5	16.0	15.0	11.0	10.0	9.5	12.5	
Dissolved Oxygen (mg/l)	8.5	3.4	8.9	7.6	11.2	11.0	9.7	9.0	10.4	11.9	11.9	13.8	
pH	8.1	8.1	7.8	8.2	8.4	8.3	8.4	8.2	8.0	8.3	7.6	8.2	
Conductivity (micromhos/cm)	350	350	310	325	400	410	440	410	375	390	400	390	
Secchi Disc (cm)	36	43	33	38	46	61	51	66	96	61	89	76	
Volts	195	190	195	195	195	185	190	185	200	185	190	190	
Amperes	7.0	6.5	7.0	7.0	8.0	8.0	8.0	7.5	6.0	6.0	8.0	6.5	
Gizzard shad	2	3	-	2	-	-	4	3	-	1	-	-	15
Muskellunge	-	-	-	-	-	-	-	-	-	1	2	-	3
Common carp	4	1	2	1	-	-	2	1	1	-	2	2	16
Quillback	1	-	-	2	-	-	5	1	1	2	1	1	14
White sucker	-	-	-	-	1	1	1	-	-	-	1	-	4
Shorthead redhorse	-	-	-	-	-	-	-	-	2	-	-	-	2
Channel catfish	1	-	-	1	-	-	-	1	2	-	-	-	5
Rock bass	3	-	1	2	2	1	5	5	3	1	2	8(1)	31(1)
Redbreast sunfish	2	3	1	-	1	5(1)	1	2	2(1)	1(1)	2	5(2)	25(5)
Pumpkinseed	26	11	5	7	9	16(1)	17(2)	19(2)	20	31(1)	48(1)	62(4)	271(11)
Bluegill	3	-	1	1	3	1	-	2	-	2	1	3	17
Lepomis hybrid	-	-	-	-	-	1	-	-	-	-	-	-	1
Smallmouth bass	5	2	-	1	1	1	1	-	2	-	-	4	17
Largemouth bass	3	-	-	-	1	1	2	2	1	1	1	9	21
White crappie	-	-	-	-	-	-	-	-	1	-	-	2	3
Black crappie	-	-	-	-	-	-	-	-	1	-	-	2	3
Yellow perch	-	-	-	-	-	1	1	-	1	-	-	2	5
Walleye	3	8	1	1	-	2	2	3	-	3	-	2	24
No. of Specimens	52	28	11	18	18	30	41	39	35	43	62	100	477
No. of Species	11	6	6	9	7	9	11	10	11	9	11	13	17

Table 8.2-8

Numbers of fishes captured in Zone TM-AOF-16A2 during the fall, 1982. Numbers in parentheses denote recaptures.

Date	27 Sep	28 Sep	29 Sep	30 Sep	1 Oct	6 Oct	12 Oct	14 Oct	18 Oct	26 Oct	27 Oct	1 Nov	Total
Time	2031	2010	2002	2010	2008	1951	2006	1950	2006	1930	2010	1934	
Duration (min)	17	17	20	16	17	17	16	17	18	15	19	17	
Air Temp (C)	15.0	17.0	17.0	15.5	19.0	19.5	15.0	16.0	8.0	8.0	9.0	14.0	
Water Temp (C)	17.0	17.0	18.0	18.0	20.0	20.0	16.0	15.0	11.5	9.5	9.0	13.0	
Dissolved Oxygen (mg/l)	8.6	8.3	8.4	7.9	11.4	11.2	9.8	8.9	10.4	12.2	11.8	14.1	
pH	8.3	8.1	7.7	8.0	8.5	8.1	7.9	8.2	7.8	8.5	7.5	7.8	
Conductivity (micromhos/cm)	360	350	325	340	400	425	410	360	400	400	400	380	
Secchi Disc (cm)	38	38	36	36	51	58	61	61	63	71	97	61	
Volts	195	190	195	195	190	175	190	185	195	185	185	165	
Amperes	7.5	7.5	7.5	6.0	8.5	9.0	9.0	8.5	6.5	8.0	7.5	7.5	
American shad	-	-	1	-	-	-	1	1	-	-	-	-	3
Gizzard shad	-	-	1	4	4	1	2	2	1	-	-	-	15
Muskellunge	-	-	-	-	-	-	-	1	-	-	-	-	1
Common carp	-	-	-	1	-	-	-	1	-	-	-	-	3
Quillback	-	3	3	-	2	-	-	-	-	1	1	2	10
White sucker	1	-	-	1	-	3	1	1	-	1	-	-	9
Shorthead redhorse	-	-	-	-	-	-	-	-	1	-	-	-	1
Channel catfish	-	-	1	1	-	-	-	-	-	-	-	-	3
Margined madtom	-	-	-	-	-	-	-	-	-	-	1	-	1
Rock bass	-	-	1	1	1	3	2	1	9	1	6	3	28
Redbreast sunfish	1	4	1	1	2	2	-	1	-	1	-	-	13
Green sunfish	-	-	-	-	-	-	1	-	-	-	-	-	1
Pumpkinseed	4	11	8	5	10	4	8(1)	8	14	5	1	6(1)	84(2)
Bluegill	-	-	-	1	2	-	-	-	-	-	-	-	3
Smallmouth bass	5	-	2(1)	1	3	3	1	3	8	7(1)	14(2)	5(1)	52(5)
Black crappie	-	-	1	-	-	-	-	-	-	-	-	-	1
Walleye	3	3(1)	1	1	2(1)	4(1)	5(1)	6(2)	2(1)	2	-	-	30(7)
No. of Specimens	14	21	20	17	26	20	21	22	35	18	26	20	260
No. of Species	5	4	10	10	8	7	8	9	6	7	7	6	17

Table 8.2-9

Number of fishes captured in Zone TM-AQF-10A3 during the fall, 1962. Numbers in parentheses denote recaptures.

	27 Sep	28 Sep	29 Sep	30 Sep	4 Oct	6 Oct	12 Oct	14 Oct	16 Oct	26 Oct	27 Oct	1 Nov	Total
Time	2103	2042	2041	2044	2047	2030	2034	2028	2050	2008	2047	2044	
Duration (min)	18	18	19	15	19	17	15	14	18	19	20	17	
Air Temp (C)	16.0	17.0	17.5	15.0	20.0	20.0	15.0	11.0	8.0	8.0	8.0	14.0	
Water Temp (C)	17.5	17.0	18.5	18.5	21.0	21.0	16.0	14.0	12.0	9.5	9.0	14.0	
Dissolved Oxygen (mg/l)	8.8	8.3	8.3	8.3	11.5	11.2	10.0	9.4	10.6	12.0	12.2	13.4	
pH	8.2	8.1	7.7	8.2	8.2	8.3	8.2	8.2	7.5	8.6	7.7	7.6	
Conductivity (microhms/cm)	400	375	375	400	450	475	475	410	440	425	440	450	
Secchi Disc (cm)	36	36	33	41	41	58	56	66	91	71	86	63	
Volts	195	185	180	180	185	175	190	185	190	190	185	185	
Amps	7.5	7.0	8.0	7.5	9.0	9.0	5.5	7.5	7.5	7.0	8.0	8.0	
American shad	-	-	-	-	-	-	-	-	-	-	-	-	1
Gizzard shad	-	-	-	1	-	-	1	2	-	-	-	-	4
Common carp	-	-	-	-	-	-	-	-	-	1	-	1	2
Quillback	5	-	2	2	1	-	1	-	10	2	1	7	31
White sucker	-	-	-	-	1	2	-	-	-	1	-	-	4
Channel catfish	-	-	-	-	-	1	-	-	-	-	-	-	1
Rock bass	3	1	-	1(1)	2	1	4	1(1)	4	15	8	9	48(2)
Redbreast sunfish	8	4	1(1)	2(1)	3(1)	1	1	4(2)	-	1(1)	1(1)	1	28(7)
Pumpkinseed	11	5	9	9	5	7	9	8	8	5	2	4	82
Bluegill	-	2	1	-	1	1	-	-	-	-	-	-	6
Smallmouth bass	2	1	-	1	-	2	-	3	12	8	4(1)	8	42(1)
Black crappie	-	1	-	-	-	-	-	-	-	-	-	-	2
Walleye	6	9(3)	1	6(1)	4(4)	4	1	1	3(2)	5(1)	5(1)	6(1)	51(13)
No. of Specimens	35	25	34	22	19	19	19	19	38	38	21	37	304
No. of Species	6	7	5	7	7	8	8	6	6	8	6	8	13

Table 8.2-10

Number of fishes captured in Zone TM-AQF-9B4 during the fall, 1962. Numbers in parentheses denote recaptures.

Date	27 Sep	28 Sep	29 Sep	30 Sep	4 Oct	6 Oct	12 Oct	14 Oct	18 Oct	26 Oct	27 Oct	Total
Time	2143	2116	2118	2120	2128	2104	2110	2100	2129	2052	2125	
Duration (min)	16	16	18	14	18	18	17	15	16	20	15	
Air Temp (C)	15.0	15.0	17.5	15.0	17.5	18.0	15.0	13.0	7.0	7.0	7.0	
Water Temp (C)	17.0	17.0	19.0	18.0	20.0	21.0	16.0	15.0	11.0	9.0	9.0	
Dissolved Oxygen (mg/l)	8.9	8.5	8.6	8.3	11.7	10.8	9.5	8.1	10.6	12.0	12.2	
pH	8.1	8.1	7.7	8.1	8.2	8.1	7.6	8.2	7.6	8.5	7.7	
Conductivity (microhms/cm)	400	375	390	400	450	460	450	425	390	410	440	
Secchi Disc (cm)	36	36	36	36	36	56	61	66	89	91	94	
Volts	180	185	185	180	175	180	190	185	195	185	180	
Amps	9.0	8.0	8.5	8.0	9.0	10.0	9.0	7.0	7.0	7.5	8.0	
How in	1	-	-	-	-	-	-	-	-	-	-	1
American shad	-	-	-	-	-	-	1	-	-	-	-	1
Gizzard shad	1	-	-	-	-	-	-	-	-	-	-	1
Common carp	1	-	-	-	-	-	2	1	1	-	-	6
Golden shiner	-	-	-	-	-	1	-	1	-	1	-	3
Quillback	7	-	6	3	4	8	7	5	18	2	5	66
White sucker	-	-	-	-	-	-	-	-	1	-	1	2
Shorthead redhorse	-	-	-	-	-	-	-	-	1	-	-	1
Channel catfish	-	-	-	-	2	-	-	-	-	-	1	3
Rock bass	-	-	1	1	-	-	-	-	6	4	6	20
Redbreast sunfish	-	-	-	-	-	-	-	-	-	-	-	1
Pumpkinseed	9	5(1)	1	1	5	9(1)	2	4	10(1)	2	-	48(3)
Smallmouth bass	1	1	1	-	-	3	3	-	4	6	-	19
Largemouth bass	-	-	-	1	-	-	-	-	-	-	-	1
White crappie	-	-	-	1	-	-	-	-	1	1	-	3
Black crappie	-	-	-	1	-	-	-	-	1	-	-	3
Yellow perch	-	1	1	-	1	-	-	-	1	-	-	3
Walleye	13	6(2)	1	3(1)	6(2)	3(2)	9(5)	2(1)	2	3(1)	2	50(14)
No. of Specimens	33	21	11	11	18	24	24	14	45	19	18	236
No. of Species	10	9	8	7	5	5	6	6	10	7	8	18

Table 8.2-11

Population estimates (N) and 95% confidence limits computed for the quillback, white sucker, rock bass, redbreast sunfish, pumpkinseed, smallmouth bass, and walleye at four zones near TMINS in fall 1974, summer and fall 1975, summer 1976, summer and fall 1977, summer and fall 1978, summer and fall 1980, summer and fall 1981, and summer and fall 1982. L_1 and L_2 denote lower and upper confidence limits of N, respectively.

Zone	TM-AQF-4A1			TM-AQF-16A2			TM-AQF-10A3			TM-AQF-9B4		
	N	L_1	L_2	N	L_1	L_2	N	L_1	L_2	N	L_1	L_2
Quillback												
Fall 1975	-	-	-	-	-	-	311	206	639	-	-	-
White sucker												
Fall 1975	-	-	-	-	-	-	115	74	248	-	-	-
Rock bass												
Summer 1975	-	-	-	207	142	384	-	-	-	-	-	-
Fall 1975	-	-	-	144	90	360	-	-	-	-	-	-
Summer 1978	-	-	-	383	294	546	330	242	518	-	-	-
Fall 1978	-	-	-	275	198	452	231	172	350	-	-	-
Summer 1980	-	-	-	-	-	-	70	45	156	-	-	-
Fall 1981	-	-	-	273	180	559	124	83	239	-	-	-
Summer 1982	-	-	-	127	76	394	-	-	-	-	-	-
Redbreast sunfish												
Fall 1974	-	-	-	274	241	318	217	186	260	54	45	67
Summer 1975	348	227	742	570	470	724	225	176	313	-	-	-
Fall 1975	113	75	227	347	281	454	150	97	334	97	56	365
Summer 1976	131	87	268	306	237	432	120	88	186	-	-	-
Summer 1977	96	71	149	87	66	129	-	-	-	-	-	-
Summer 1978	87	62	148	-	-	-	23	15	50	-	-	-
Fall 1978	102	63	259	-	-	-	-	-	-	-	-	-
Summer 1980	52	30	191	-	-	-	-	-	-	-	-	-
Summer 1981	48	37	67	181	110	517	64	42	132	-	-	-
Fall 1981	-	-	-	-	-	-	103	64	253	-	-	-
Summer 1982	-	-	-	81	52	181	173	127	273	-	-	-
Fall 1982	46	30	100	-	-	-	42	27	93	-	-	-
Pumpkinseed												
Summer 1975	-	-	-	532	394	823	232	160	417	-	-	-
Summer 1976	-	-	-	-	-	-	265	197	406	-	-	-
Summer 1978	421	316	628	-	-	-	-	-	-	-	-	-
Summer 1980	-	-	-	460	319	828	659	408	1702	-	-	-
Fall 1980	-	-	-	877	549	2180	-	-	-	-	-	-
Summer 1981	314	193	845	952	652	1767	-	-	-	-	-	-
Fall 1981	-	-	-	580	358	1537	793	552	1409	726	622	872
Summer 1982	-	-	-	547	411	817	-	-	-	49	29	162
Fall 1982	3220	2022	7908	-	-	-	-	-	-	-	-	-
Bluegill												
Summer 1982	-	-	-	-	-	-	50	33	105	-	-	-
Smallmouth bass												
Fall 1974	-	-	-	50	43	59	-	-	-	-	-	-
Summer 1975	-	-	-	114	91	154	40	26	86	-	-	-
Fall 1975	-	-	-	201	131	427	51	31	158	-	-	-
Summer 1976	-	-	-	175	113	390	-	-	-	-	-	-
Summer 1977	3896	3021	5477	394	288	624	848	698	1081	-	-	-
Fall 1977	573	368	1301	1134	925	1465	882	545	2302	-	-	-
Summer 1978	-	-	-	-	-	-	138	97	242	-	-	-
Fall 1978	115	5	250	455	295	992	326	205	802	173	144	216
Summer 1980	-	-	-	66	39	221	-	-	-	-	-	-
Fall 1980	-	-	-	444	283	1020	-	-	-	-	-	-
Summer 1981	-	-	-	334	229	614	286	173	828	-	-	-
Fall 1981	-	-	-	-	-	-	-	-	-	98	71	160
Summer 1982	-	-	-	251	167	505	543	265	771	-	-	-
Fall 1982	-	-	-	125	77	310	-	-	-	-	-	-
Walleye												
Fall 1978	123	56	218	-	-	-	98	65	205	50	34	91
Summer 1980	-	-	-	43	29	84	173	114	360	-	-	-
Fall 1980	1070	700	2272	-	-	-	-	-	-	-	-	-
Fall 1981	237	146	636	106	63	341	80	47	278	104	64	273
Fall 1982	-	-	-	52	31	160	87	47	524	66	46	115

Table 8.2-12

Results of the two factor analysis of variance test for mean numbers of fish per minute taken at four zones during 13 population estimate periods (summer, fall), 1975 through 1982.

Source of Variation	df	SS	MS	F
Subgroups	51	575.59	11.29	
Zones	3	37.67	12.56	13.42*
Sampling period	12	406.57	33.88	36.22*
Interaction	36	131.37	3.65	3.90*
Error	513	479.89	0.94	
Total	564	1055.49		

* Significant at $P \leq 0.05$.

Table 8.2-13

Results of Duncan's new multiple range test comparing mean numbers of fish per minute taken at four population estimate zones, 1975 through 1982. Zones are ranked from lowest to highest mean number of fish per minute. Means underlined are not significantly different ($P \leq 0.05$).

Zones	TM-AQF-9B4	TM-AQF-4A1	TM-AQF-10A3	TM-AQF-16A2
Means	<u>1.32</u>	<u>1.78</u>	<u>1.92</u>	2.01

Table 8.2-14

Results of Duncan's new multiple range test comparing mean numbers of fish per minute captured during 13 population estimate sampling periods (summer, S; fall, F), 1975 through 1982. Sampling periods are ranked lowest to highest mean number of fish per minute. Means underlined are not significantly different ($P \leq 0.05$).

Sampling periods	F 76	S 80	S 76	S 78	S 81	S 77	F 82	F 80	S 82	F 75	F 78	F 81	F 77
Means	0.30	0.91	<u>1.35</u>	<u>1.41</u>	<u>1.44</u>	<u>1.44</u>	1.60	1.84	1.87	2.09	2.61	3.09	4.42

Table 8.3-1

Kendall's tau correlation comparing the mean numbers of fish per minute captured during sampling periods when estimates were made to the estimated number of each species per zone.

	TM-AQF-4A1	TM-AQF-16A2	TM-AQF-10A3	TM-AQF-9B4
Rock bass	-	0.00	0.19	-
Redbreast sunfish	-0.17	0.14	0.09	-
Pumpkinseed	-	0.07	-	-
Smallmouth bass	-	0.37*	0.46*	-
Walleye	0.50	-0.10	0.00	0.50

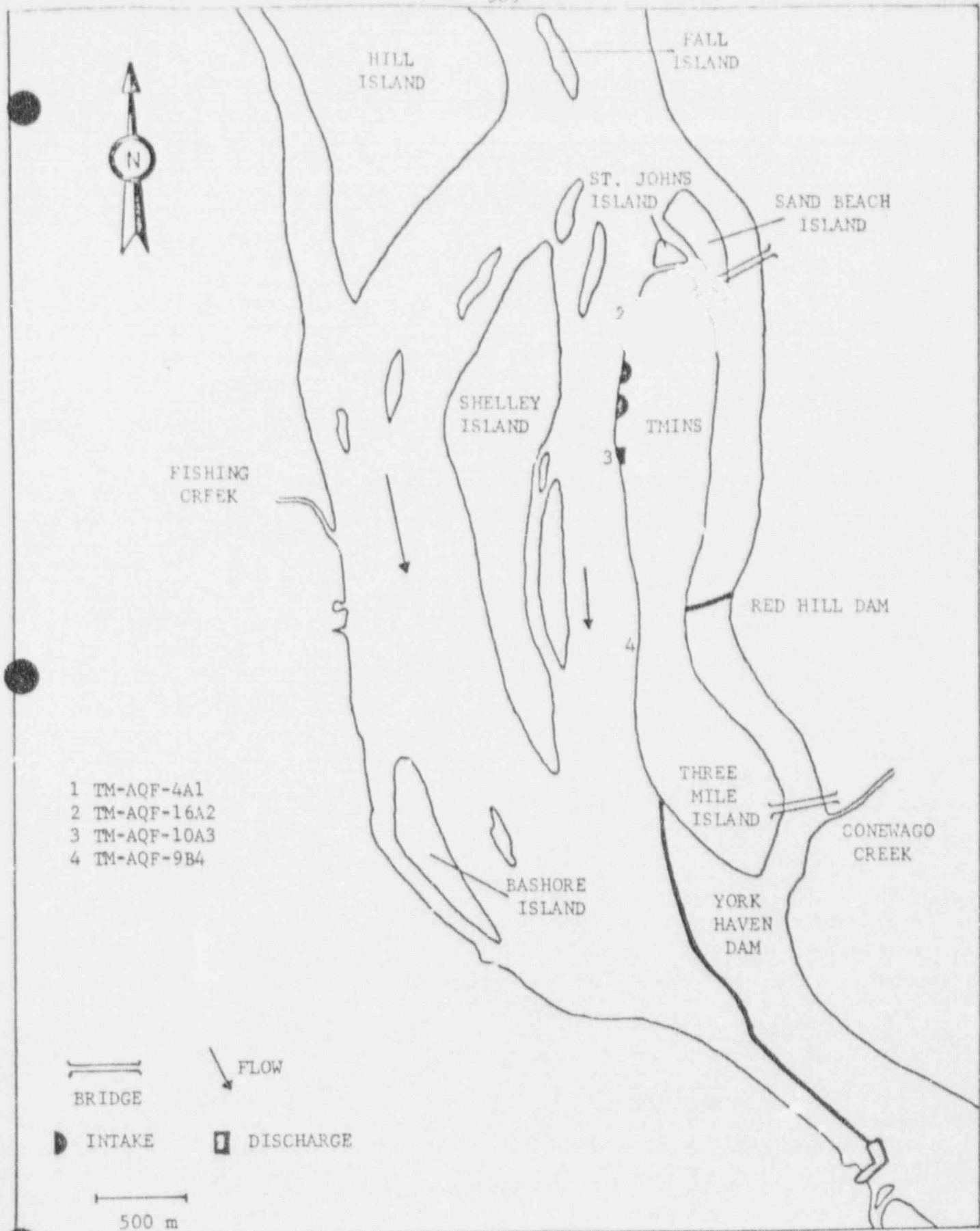
* Positively correlated at $P \leq 0.05$.

Table 8.3-2

Kendall's tau correlation comparing the total and estimated numbers of redbreast sunfish and smallmouth bass at each zone during sampling periods, when estimates were made.

	TM-AQF-4A1	TM-AQF-16A2	TM-AQF-10A3
Redbreast sunfish	0.69*	-	0.89*
Smallmouth bass	-	0.55*	0.71*

* Positively correlated at $P \leq 0.05$.



- 1 TM-AQF-4A1
- 2 TM-AQF-16A2
- 3 TM-AQF-10A3
- 4 TM-AQF-9B4

Figure 8.1-1. Location of electrofishing zones sampled for population estimates.

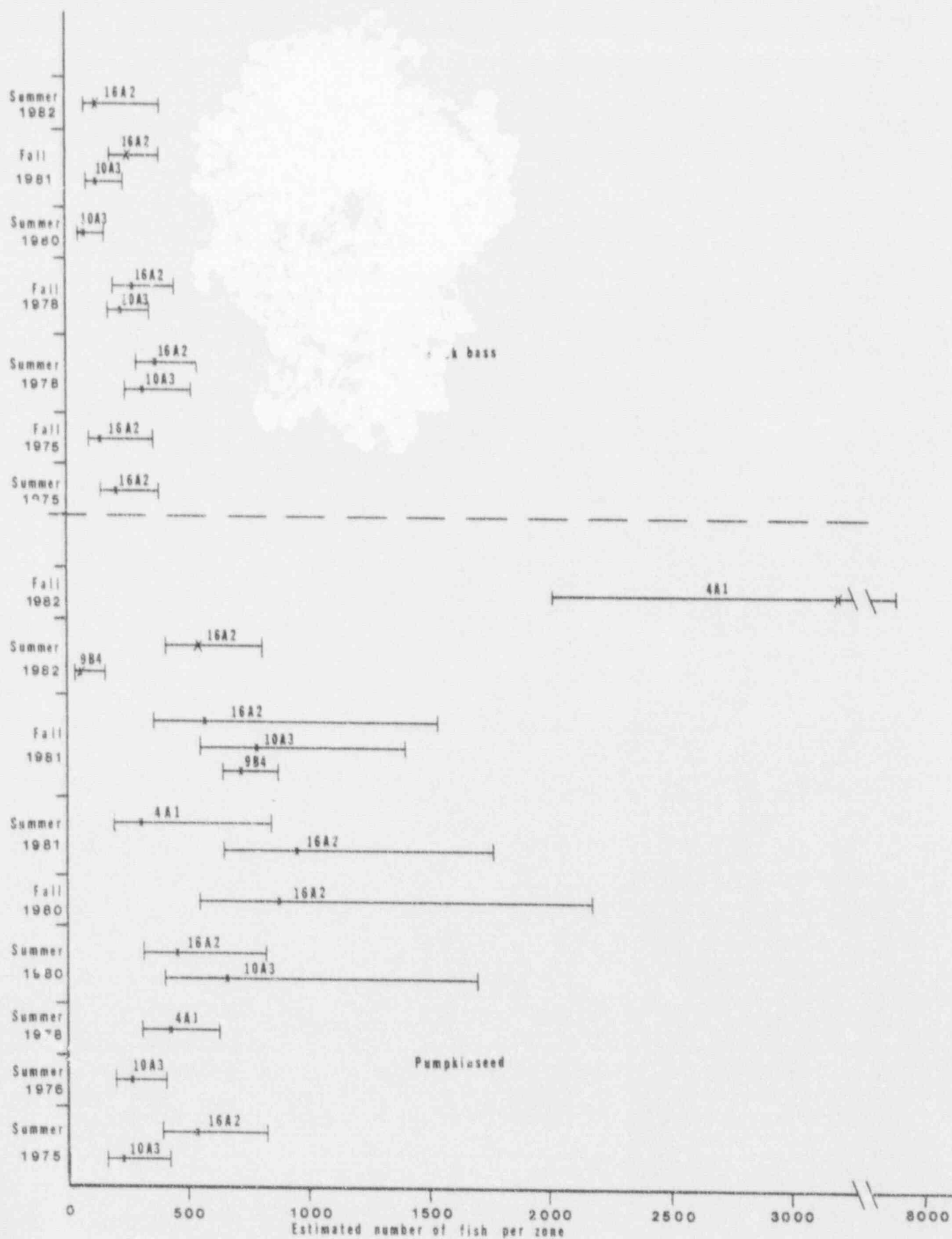


Figure 8.2-1. Population estimates and 95% confidence limits computed for rock bass and pumpkinseed at four electrofishing zones near TMINS.

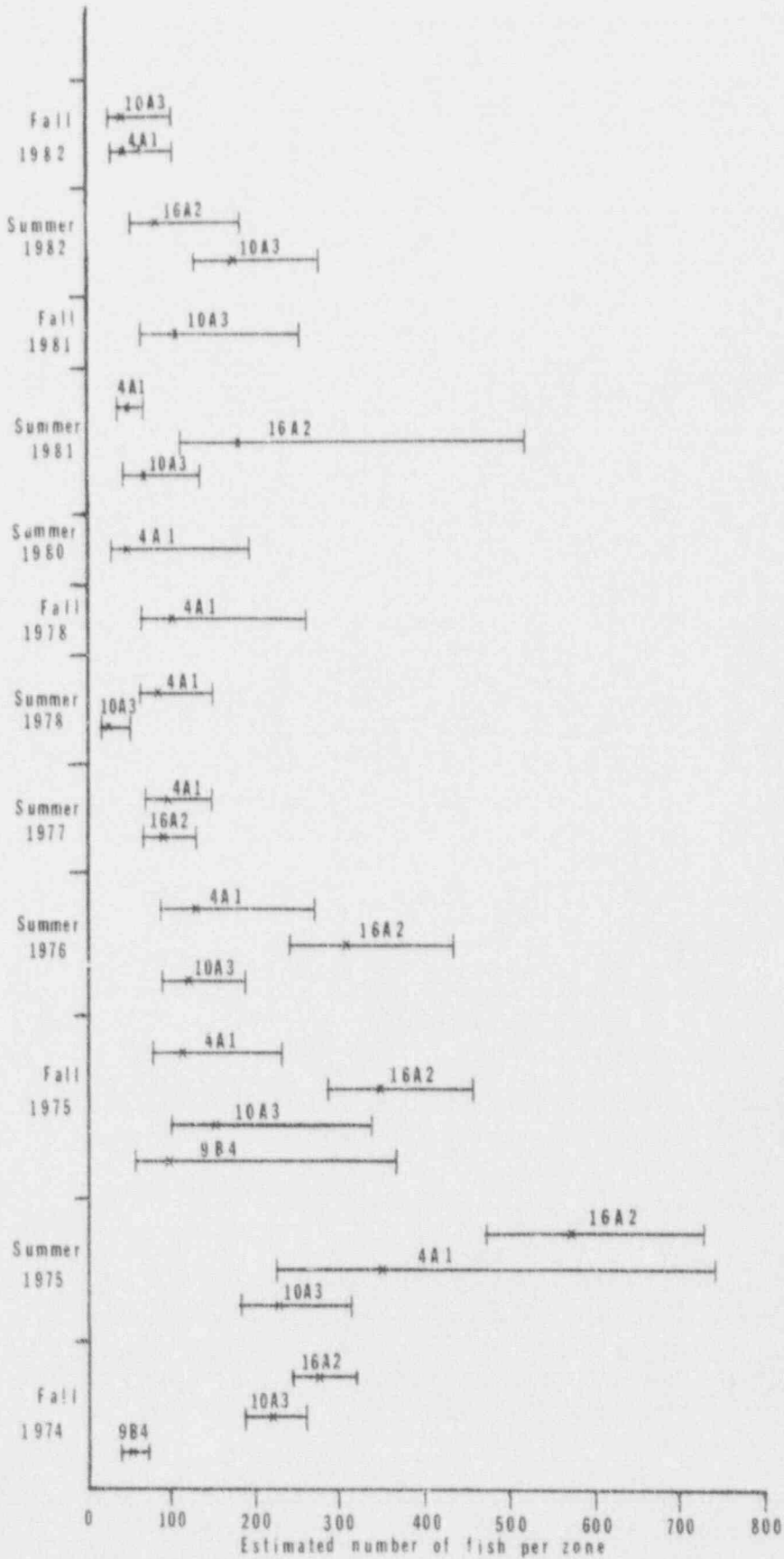


Figure 8.2-2. Population estimates and 95% confidence limits computed for redbreast sunfish at four electrofishing zones near TMINS.

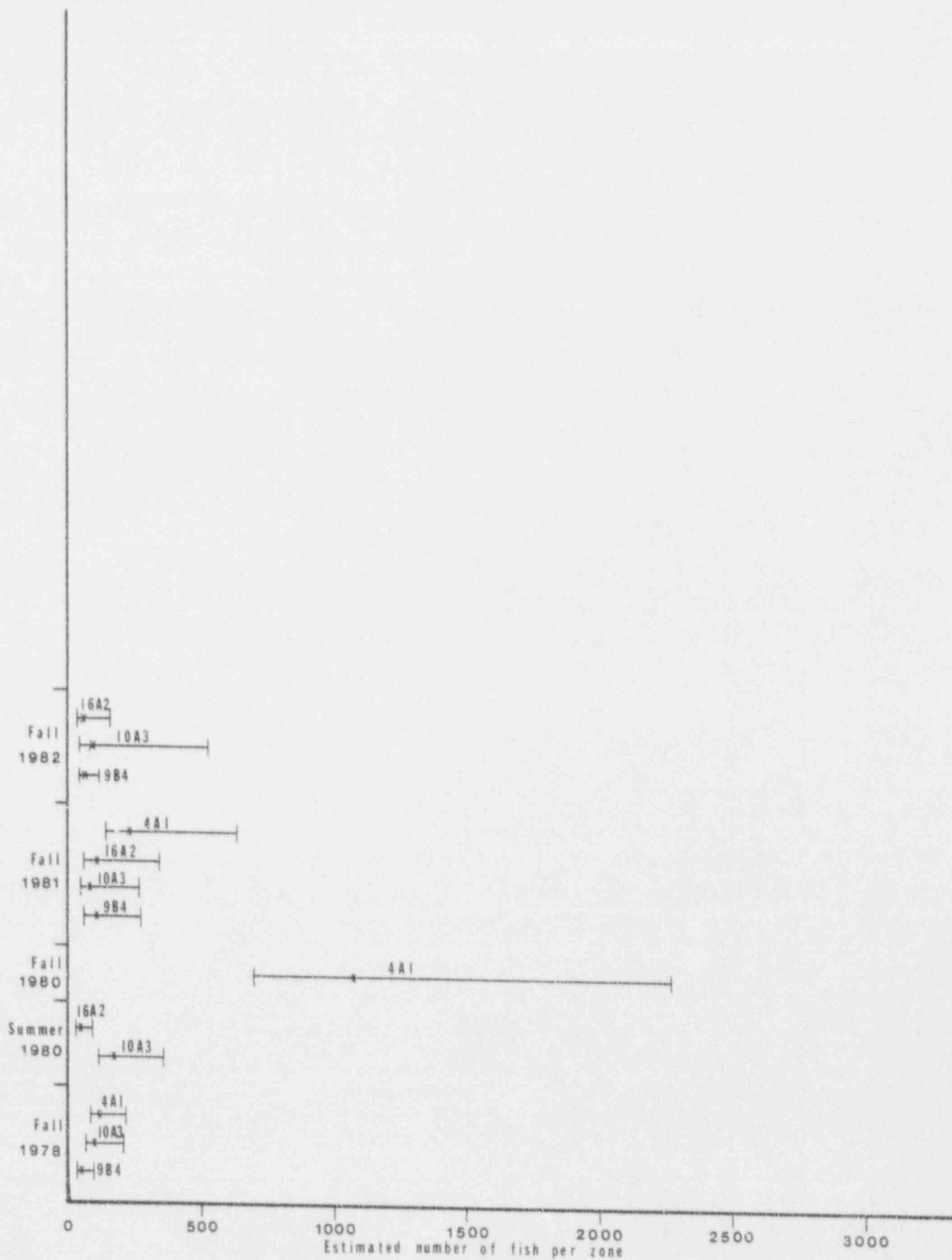


Figure 8.2-4. Population estimates and 95% confidence limits computed for walleye at four electrofishing zones near TMINS.

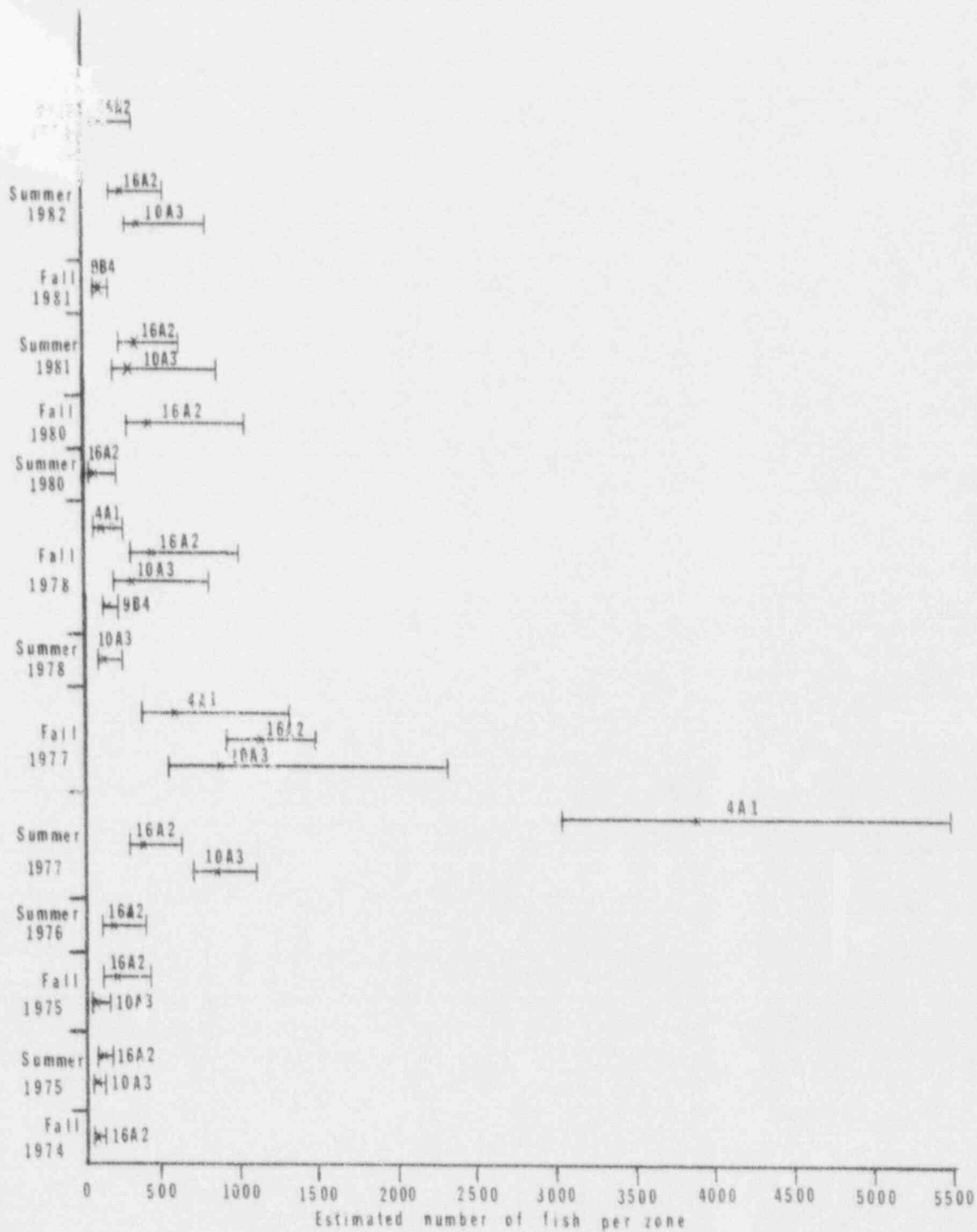


Figure 8.2-3. Population estimates and 95% confidence limits computed for smallmouth bass at four electrofishing zones near TMINS.

9.0 CREEL SURVEYS

Surveys of anglers fishing in the Susquehanna River near TMINS were conducted to (1) determine the extent and success of sport fishing, and (2) obtain information on angler residence and use of catch.

9.1 METHODS

Roving creel surveys were conducted on two weekend days and two weekdays each month, January through December 1982. Survey dates were preselected to equally represent each weekday and weekend day. The reach of river surveyed, which included over 793 hectares upstream and downstream of York Haven and Red Hill dams, was divided into four areas: the General Reservoir (GR), West Dam, East Dam, and York Haven Generating Station (YHGS) (Figure 9.1-1). The GR was partitioned into 12 zones (Figure 9.1-2), and along with the West Dam and East Dam were surveyed on a 16 km circuit by boat. Interviews included all anglers in boats (except for those trolling) and along shore. The YHGS area was surveyed on foot with anglers in boats being interviewed only if they were near shore or had completed fishing.

Angler interviews were conducted during three 4-hour periods each survey day: 0900-1300 h, 1301-1700 h, and 1701-2100 h. Anglers interviewed more than once per survey-day were considered separate anglers. Weather condition, time, and air and surface water temperatures were recorded at each area (Figure 9.1-1) during each survey period; river stage (obtained from the River Forecast Center, Harrisburg, Pennsylvania) was recorded for each survey-day.

Anglers were interviewed concerning: their residence, total time fished until interviewed (to the nearest five minutes), composition of catch, and use of catch (kept, released, given away, or other). Use of catch and residence information were recorded only during the first interview for anglers interviewed more than once per survey-day. Anglers were also questioned as to whether their use of catch was still affected by the 1979 TMINS accident. Other data recorded were: whether fishing trip was complete or incomplete, estimated angler age (categorized as those <18 years, 18 to 29, 30 to 65, and >65), whether anglers fished from shore or boat (GR only), and zone fished (GR only).

When anglers were unsure of species identification or reluctant to have their catch examined, general identifications such as suckers (*Catostomidae*), bullhead catfishes (*Ictalurus* spp.), sunfishes (*Lepomis* spp.), or crappie (*Pomoxis* spp.) were used (Funk 1969). Fishes caught by anglers in 1982 were listed in Table 9.1-1; scientific and common names and taxonomic order followed Robins et al. (1980).

Anglers were interviewed in all creel survey areas during each survey period except as follows: 1) Surveys were conducted only at YHGS on 2, 17, and 25 January; 2, 7, 20, and 26 February; and 7 March because of ice. 2) On 8 January and from 3 November through December no surveys were conducted at the GR, West Dam, or East Dam during the 1701-2100 h period due to darkness. 3) Surveys were limited to YHGS on 27 March and 4 and 17 April due to high wind conditions. 4) Surveys during the 0900-1300 h period at the GR, West Dam, and East Dam areas on 11 March and 29 April were incomplete due to fog and boat motor failure, respectively.

Creel survey data were accepted with the assumptions that the rate of catch before and after the interview was the same and that catch per unit effort was not different between complete or incomplete interview data. These assumptions were found to be valid by DiCostanzo (1956), Frisbie and Ritchie (1963), Groen and Schmulbach (1978), and Nardacci et al. (1976).

Catch per hour of angler effort (c/e) and harvest per hour (h/e) were calculated from interview data for each area and for the year. Mean values (\bar{X}) for fish caught, fish kept, and hours fished per angler were derived from the formula:

$$\bar{X} = X/Y$$

where X = surveyed number of fish caught, fish kept, or hours fished and Y = surveyed number of anglers (Nardacci et al. 1976).

Total estimates of anglers, fish caught, fish kept (harvested), and hours fished for January through December were calculated without extrapolating for missed survey periods. Total estimates (E) of anglers were derived from the formula:

$$E = \sum_{i=1}^n [(Awe) (Twe) + (Awd) (Twd)]$$

where Awe = mean number of anglers/weekend day each month, Twe = total number of weekend days each month, Awd = mean number of anglers/weekday each month, and Twd = total number of weekdays each month (Nardacci et al. 1976). The estimated total anglers (E) were multiplied by the mean surveyed values (\bar{X}) to obtain an estimate of total fish caught,

fish kept, and hours fished. The mean time fished by anglers used in computing these estimates was derived from the time the angler(s) began fishing up to the time of interview.

A second method for computing estimates assumes that anglers were contacted during the midpoint of their fishing trip. Doubling the total time from the start of the angler trip to the time of interview produces an estimate of the complete fishing trip (DiCostanzo 1956, Groen and Schmulbach 1978). Andrews et al. (1974), DiCostanzo (1956), and Groen and Schmulbach (1978) preferred using the times from completed fishing trips to calculate their estimates. The average time fished per angler, when doubled, has been found to correspond with complete fishing trip data (Frisbie and Ritchie 1963, Nardacci et al. 1976, Plosila 1961).

Estimates were considered valid only with the assumptions that the number of anglers who were not interviewed during a survey-day (trolling, inaccessible, night fishing), approximated those interviewed more than once per day (considered separate anglers); and that anglers who fished for a short time had an equal chance of being interviewed as those who fished for a long time.

Two factor analysis of variance (ANOVA) tests utilizing numbers of anglers, fish caught, fish kept, and hours fished were applied to analyze differences among months and areas in 1982 and among years (1975 through 1982) and areas. Duncan's new multiple range test was used to identify which means were significant after an initial difference was indicated by the ANOVA (Steel and Torrie 1960).

Indices of percent similarity (PSc) (described in Section 2.0) were used to determine the similarity of species composition caught and kept between areas, and similarities of angler residence between years for each area.

The chi-square test for independence (described in Section 7.0) was used to determine if the residence and age group of anglers who reported a change in use of catch due to the 1979 TMINS accident were independent of those reporting no change.

9.2 RESULTS

Summaries of each 1982 creel survey-day are presented in Tables 9.2-1 through 9.2-45. A total of 2,866 anglers interviewed on 48 survey-days (24 weekend days and 24 weekdays) fished for 4,893.87 hours, caught 6,569 fish, and kept 1,815 (Table 9.2-46). Mean values per angler of fish caught, fish kept, hours fished, catch per unit effort (c/e), and harvest per unit effort (h/e) were 2.29 fish, 0.63 fish, 1.71 hours, 1.34 fish per hour, and 0.37 fish per hour, respectively.

The largest number of anglers, fish caught, fish kept, and hours fished (795, 2,245, 736, and 1,442.00, respectively) in all areas combined were reported in May, however the largest c/e (2.06) and h/e (0.69) were recorded in April and November, respectively (Table 9.2-46). The c/e values were dynamic March through July, relatively stable July through November, and substantially declined in December. The h/e values peaked in April, gradually declined through August, resurged to a second (and larger) peak in November, and substantially declined in December.

The total number of anglers, the number of fish they caught and kept, and the hours that they spent fishing peaked in May and generally declined through December in 1982 (Figure 9.2-1).

The YHGS and GR received the heaviest fishing pressure (angler effort) in terms of anglers and hours fished and provided for the greatest fishing success in terms of numbers of fish caught and kept (Table 9.2-46). The YHGS and GR combined, accounted for over 78% of the anglers, 62% of the fish caught, 67% of the fish kept, and 80% of the hours fished. The West Dam had the highest c/e for any month (9.70 in April) and for the year (3.00). The highest h/e for any month (1.16 in April) and for the year (0.73) was found at the East Dam.

Surveys indicated that there were more anglers, fish caught, fish kept, and hours fished on weekends than on weekdays (with the exception of the East Dam) (Tables 9.2-47 through 9.2-50). Von Geldern and Tomlinson (1973) and Thuemler (1981) also noted that fishing effort was greater on weekends. The number of fish caught and kept on weekdays was higher than on weekends at the East Dam. Weekend anglers comprised over 51% of the anglers interviewed and over 54% of the hours fished in all areas. The percent of fish caught and kept during weekend survey-days was over 55% and 50%, respectively, for all areas except the East Dam. The total c/e for weekdays was higher than weekend days in all areas.

More GR anglers (239) fished in the west channel, west shore zone (Zone 1) than in any other zone (Table 9.2-51). Zone 1 also had the

greatest number of fish kept (116) and highest h/e (0.30). Several boat launch and public access areas located at this zone may account for the high numbers recorded. Anglers interviewed in Zone 11 (west of Fall Island, east of Hill Island) reported fishing for more hours (401.18) and caught more fish (476) than anglers in any other zone. Other zones contributing substantially to the GR fishery were 3, 9, and 10. The highest annual c/e recorded for any zone was 1.77 from Zone 7 (north center channel, east shore), which included the area immediately upriver from the TMINS Intakes. However, this value was calculated from a small sample of 15 anglers. In general, annual c/e and h/e values were variable (0.32 to 1.77 and 0.04 to 0.30, respectively) between zones.

Over 65% of all anglers interviewed from the GR fished from boats and over 82% of the fish caught, 74% of the fish kept, and 75% of the hours fished were by boat anglers (Table 9.2-52). The average c/e values for boat anglers were greater than those for shore anglers for all months except November and December. However, h/e values were higher for shore anglers than boat anglers during most months. These results parallel Weithman and Haas (1980) who reported greater c/e values for anglers fishing from boats. Boat anglers have an increased mobility allowing them to encompass a large area, fish a variety of habitats, and more readily locate areas with a higher fish abundance. Some areas in the GR with high catch rates (Zones 3, 7, 10, and 11) were relatively inaccessible to shore anglers (Figure 9.1-2).

The channel catfish, rock bass, smallmouth bass, and walleye comprised 82.8% of the total catch and 68.6% of all fish kept in

1982 (Table 9.2-53). The smallmouth bass was the most abundant species caught and kept by anglers; it ranked first in the catch April through November (Figure 9.2-2). A comparison of percentage values of smallmouth bass caught to those kept indicated noticeably lower percentages kept, June through September. These lower values were a result of the relatively large catch of small [length less than the legal harvest size (254.0 mm)] smallmouth bass along with the higher numbers of channel catfish kept during those months. Walleye, the second most abundant species caught by anglers, were not frequently harvested. The low percentages of walleye kept in April and May were due to the closed fishing season, and low percentages in other months were reflective of the relatively small size [less than legal (381.0 mm)] of fish caught. Channel catfish, third in abundance, were most commonly caught and kept May through October; rock bass were abundant April through November.

Over 47% of the smallmouth bass caught and over 38% of those harvested were taken in the GR (Table 9.2-54). More than 67% of the walleye were caught at the West Dam and East Dam areas, while over 52% of the walleye kept were from the YHGS. Channel catfish were caught and kept most frequently (38.7% and 63.6%, respectively) at the YHGS. Most rock bass were caught (43.1%) in the GR while the major percentage kept (41.7%) were from the YHGS. The largest catch (49.4%) and harvest (58.1%) of sunfishes (Lepomis spp.) occurred in the GR. Common carp were more abundant (84.7% caught, 93.2% kept) at the YHGS than at any other area.

The predominant species caught (61.1%) and kept (39.8%) in the GR was the smallmouth bass; rock bass was second most common (Table 9.2-55). Smallmouth bass dominated the catch (44.2%) and harvest (50.9%) at the West Dam where walleye and channel catfish were also common. Over 68% of the fishes caught and 50% of those harvested at the East Dam were rock bass, smallmouth bass, and walleye. At the YHGS, 34.3% of the fish caught were smallmouth bass and 23.4% of those kept were channel catfish.

Use of catch information was obtained from 2,586 of the 2,866 anglers interviewed (Table 9.2-56). Over 75% indicated that they ate at least some of their catch, 20.6% released all they caught, and 1.4% gave away all of their catch (Figure 9.2-3). One hundred thirteen (4.4%) anglers ate at least some of their catch prior to the 1979 TMINS accident but to date did otherwise. Over 88% of the 113 anglers reported that they now release all they catch.

York County residents represented more than half (51.2%) of the anglers interviewed during 1982 (Figure 9.2-4). Residents of Dauphin, Cumberland, Lancaster, and Lebanon counties comprised 23.2%, 11.2%, 6.9%, and 3.2% of the total anglers, respective. Less than 5% of the anglers interviewed were residents of 14 other counties and eight anglers (<1%) were not Pennsylvania residents. Most GR, West Dam, and YHGS anglers were from York County, while East Dam anglers were predominantly Dauphin County residents.

The highest proportion of anglers reporting changes in use of catch due to the TMINS accident were residents of Cumberland, Davonin, and "Other" counties (Table 9.2-57). The largest number (53) of anglers reporting changes in use of catch were from York County, however they accounted for only 4.0% of the total (1,339) York County residents interviewed.

Over 44% of all anglers interviewed were in the 30-65 age group (Table 9.2-57). Greater than 5% of the 30-65 age group and 4% of the 18-29 year old anglers indicated a change in use of catch. Less than 3% of the youngest (<18) and oldest (>65) age groups reported changing their use of catch.

9.2.1 DATA ANALYSIS

Results of the two factor ANOVA tests indicated significant differences ($P \leq 0.05$) in number of anglers, fish caught, fish kept, and hours fished between months and areas in 1982 (Table 9.2-58). Duncan's new multiple range test revealed no significant differences between the West Dam and East Dam or the YHGS and GR for anglers, fish caught, and hours fished (Table 9.2-59). Comparisons of fish kept showed significantly more fish being kept at YHGS than at any other area. Monthly comparisons indicated that numbers of anglers, fish caught, fish kept, and hours fished in May were significantly higher than in any other month (Table 9.2-60); November and December ranked lowest for all variables.

PSc values generally indicated that the similarity of species composition of fish caught was greater than species composition kept

between the areas (Table 9.2-61). PSc values of species caught ranged from 62% (West Dam and East Dam vs. GR) to 78% (YHGS vs. West Dam). Values for species kept ranged from 38% (East Dam vs. West Dam) to 69% (YHGS vs. GR).

PSc values of anglers residence for each creel survey area, 1975 through 1982, are presented in Table 9.2-62. All areas, with the exception of the West Dam, had PSc values of 76% or greater. Values between the years ranged from 76 to 95% in the GR, 68 to 100% at the West Dam, 85 to 96% at the East Dam, and 83 to 98% at YHGS. The highest PSc of angler residence for all areas combined was 98%, 1979 vs. 1980 and 1978 vs. 1981.

Results of chi-square tests for independence applied to anglers reporting changes in use of catch due to the 1979 TMINS accident indicated that change was independent of residence and age group (Table 9.2-57).

9.3 DISCUSSION

In 1982, an estimated 19,914 anglers caught 45,603 fish, kept 12,546 fish, and fished for 34,053 hours; resulting in an estimated annual c/e of 1.34 and h/e of 0.37 (Table 9.3-1 and Figure 9.3-1). The number of anglers, fish kept, and hours fished were the highest since the inception of the program in 1974. Estimates achieved by doubling the length of each angler fishing trip yielded 91,206 fish caught, 25,092 fish kept, and 68,106 hours fished. Number of anglers, catch per effort, and harvest per effort remained the same for both estimates. The average time fished by anglers reporting that they had completed their fishing

trip (about 14% of all anglers interviewed) was 3.44 hours. This value was similar to the average fishing time of 3.42 hours derived from the doubled fishing trip estimate, thus reinforcing this procedure.

The increased popularity of angling may in part explain the record number of anglers in 1982. Martin (1977) found that licensed Pennsylvania anglers increased by 10.1% from 1971 to 1975. The Pennsylvania Fish Commission reported the sale of 1,072,987 licenses in 1980 and 1,092,038 in 1981 (Dave Wolf, Pennsylvania Fish Commission, Harrisburg, Pennsylvania, personal communication). Increased angler success (c/e) within the survey area during recent years may have attracted more anglers. Neuhold and Lu (1957), Plosila (1961), and Weithman and Haas (1980) all observed an increase in angler effort as success increased.

Record numbers of anglers and hours fished were recorded at the YHGS (with greatest increases May, July, August, November, and December), and record numbers of fish were kept at the East Dam and YHGS (greatest increases during May and/or June) during 1982. The c/e in the GR and h/e at the East Dam were the highest recorded for these areas since the inception of the program in 1974; the h/e in the GR was the lowest to date. All other values from all areas were within the ranges of those reported in previous years (Tables 9.3-2 through 9.3-5 and Figure 9.3-2).

The two factor ANOVA tests indicated significant differences among areas and years (Table 9.3-6). Duncan's new multiple range test applied to areas indicated the mean number of anglers, fish caught, fish kept, and hours fished were significantly higher at the GR and YHGS areas than

at the West Dam and East Dam areas (Table 9.3-7). Significant differences did not exist between the West Dam and East Dam for all variables, and between the GR and YHGS for fish caught and hours fished. Duncan's new multiple range test applied to years indicated no significant differences between the mean numbers of anglers, fish caught, fish kept, and hours fished during 1975 through 1977 or 1978 through 1982. All variables were significantly higher in 1981 and 1982, than during 1975 through 1977.

Centrarchids comprised over 72% of the total fish taken by electrofishing (Section 6.3), 86% of those taken by trapnet (Section 6.1), and 89% of the fish from GR creel surveys (Table 9.2-55) in York Haven Pond during 1982. Creel surveys have indicated that the four most abundant fishes caught and kept by anglers each year have been the channel catfish, rock bass, smallmouth bass, and walleye (Figure 9.3-3). The channel catfish, one of the most commonly harvested fishes 1975 through 1978 (>20% caught and 10% kept), accounted for less than 12% of the total catch and less than 5% of the harvest in 1982. Rock bass and smallmouth bass catch and harvest declined slightly since 1981. During all years since the inception of the creel survey program, almost half of the rock bass caught were kept. Smallmouth bass have dominated the percent composition of fishes caught in all years, however the percentage harvested has remained low. The percentage of smallmouth bass harvested in 1982 was the lowest recorded since 1979. Walleye have also been caught frequently but very few (<3%) have been kept. The percent of walleye caught declined slightly in 1981 and 1982 after increasing each year since 1975.

The Pennsylvania Fish Commission has permitted the year-round harvest of smallmouth bass and largemouth bass since 1981, after previously allowing harvest only between 14 March and 10 June. The minimum allowable size for harvest also was changed to 254.0 mm (10 inches) an increase of 25.4 mm (1 inch) from previous years. The new regulations have resulted in nearly 62% of the 1981 smallmouth bass catch and 82% of the 1982 catch being undersize. This represented an increase of 17% from 1980 to 1981, and 20% from 1981 to 1982 (Nardacci and Associates 1982). Smallmouth bass harvested in subsequent years may continue to reflect the effects of the new State regulations.

Increases in the number of anglers were often associated with increases in c/e values, while h/e values were less predictable (remaining relatively low) (Table 9.3-8). This may indicate that relatively low numbers of fishes caught were of legal size and/or anglers fished more for recreation than as a source of food. Those interested in recreation were reflected by the many anglers reporting that they released or gave away their catch. Cox (1977), Harmon (1978), and Rodgers (1980) found that anglers fished primarily for recreation.

The creel survey data indicated that the local recreational fishery was minimally affected by the 1979 TMINS accident. During 1982 the majority of anglers reporting a change in their use of catch due to the accident were between the ages of 18 and 65 (Table 9.2-57). Angler response to questions concerning use of catch could be biased by the legal status of the game fishes sought and/or caught (i.e. release of fish smaller than legal size). Chi-square testing indicated no significant

relationship between angler age and change in use of catch in 1981 or 1982, however in 1980 significantly more 18-29 year old anglers reported a change (Nardacci and Associates 1981, 1982). Houts et al. (1980b) reported that younger persons tended to be more concerned about safety; however, recently (Nardacci and Associates 1982) the number of young people reporting stress due to the accident has declined.

Chi-square testing indicated that change in use of catch due to the TMINS accident were dependent of angler residence in 1981 and independent in 1980 and 1982 (Nardacci and Associates 1982). From 1981 to 1982 the percentage of anglers reporting changes increased in Cumberland (2.8 to 5.4%) and Dauphin (4.5 to 5.1%) counties; and decreased substantially in Lancaster (6.7 to 2.2%), Lebanon (12.3 to 3.6%), and York (7.8 to 4.0%) counties.

No measurable change in fishing effort (due to the TMINS accident) was detected as increased numbers of new anglers would overshadow anglers avoiding the area. The reported changes in use of catch may reflect anglers' concern for their own safety and the safety of their families. Houts et al. (1980a) indicated that 10 to 20% of the population within 15 miles of TMINS displayed heightened levels of distress compared to those beyond 40 miles. Houts et al. (1981) reported a decrease in resident's concern, regarding TMINS, for the safety of themselves and their families from January through October 1980. From 1980 to 1981 the number of anglers reporting a change in use of catch due to the accident decreased by 2.0% (Nardacci and Associates 1982). Changes in

use of catch were reported by 5.6% of the anglers in 1981 and 4.3% in 1982, a decrease of 1.3%. This steady decline in number of anglers still reporting a change in use of catch due to the 1979 TMINS accident (Figure 9.3-4), associated with a gradual increase in number of fish being harvested by anglers since the accident, suggests that the further removed in time from the accident the less affect it will have on anglers.

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Table 9.1-1

List of scientific and common names of fishes observed during creel survey interviews from the Susquehanna River near the Three Mile Island Nuclear Station, 1982.

Scientific Name	Common Name
Clupeidae	Herrings
<u>Dorosoma cepedianum</u> (Lesueur)	Gizzard shad
Salmonidae	Trouts
<u>Salmo gairdneri</u> Richardson	Rainbow trout
<u>Salmo trutta</u> Linnaeus	Brown trout
Esocidae	Pikes
<u>Esox masquinongy</u> Mitchill	Muskellunge
Cyprinidae	Carps and Minnows
<u>Cyprinus carpio</u> Linnaeus	Common carp
<u>Semotilus atromaculatus</u> (Mitchill)	Creek chub
<u>Semotilus corporalis</u> (Mitchill)	Fallfish
Catostomidae	Suckers
<u>Carpiodes cyprinus</u> (Lesueur)	Quillback
<u>Catostomus commersoni</u> (Lacepède)	White sucker
<u>Hypentelium nigricans</u> (Lesueur)	Northern hog sucker
<u>Moxostoma macrolepidotum</u> (Lesueur)	Shorthead redhorse
Ictaluridae	Bullhead catfishes
<u>Ictalurus natalis</u> (Lesueur)	Yellow bullhead
<u>Ictalurus nebulosus</u> (Lesueur)	Brown bullhead
<u>Ictalurus punctatus</u> (Rafinesque)	Channel catfish
Centrarchidae	Sunfishes
<u>Ambloplites rupestris</u> (Rafinesque)	Rock bass
<u>Lepomis auritus</u> (Linnaeus)	Redbreast sunfish
<u>Lepomis cyanellus</u> Rafinesque	Green sunfish
<u>Lepomis gibbosus</u> (Linnaeus)	Pumpkinseed
<u>Lepomis macrochirus</u> Rafinesque	Bluegill
<u>Micropterus dolomieu</u> Lacepède	Smallmouth bass
<u>Micropterus salmoides</u> (Lacepède)	Largemouth bass
<u>Pomoxis annularis</u> Rafinesque	White crappie
<u>Pomoxis nigromaculatus</u> (Lesueur)	Black crappie
Percidae	Perches
<u>Perca flavescens</u> (Mitchill)	Yellow perch
<u>Stizostedion vitreum vitreum</u> (Mitchill)	Walleye

Table 9.2-1

Creel survey data from the GR. fo. each survey day in January 1982.

Day	2 Sat ¹			8 Fri Clear			17 Sun ²			25 Mon ¹			
Weather													
River Stage (ft)	1.37			2.01			2.17			1.95			
Air Temperature (C)				+4.0 +3.0									
Water Temperature (C)				0.0 +0.5									
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:												TOTAL	
Anglers													
Fish Caught													
Fish Kept													
Hours Fished													
Catch/Effort (h)													
Day Totals:													
Anglers													
Fish Caught													
Fish Kept													
Hours Fished													
Catch/Effort (h)													
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total

¹ Surveys not conducted due to ice.² Survey not conducted due to darkness.

Table 9.2-2

Creel survey data from the West Dam for each survey day in January 1982.

Day	2 Sat ¹			8 Fri Clear			17 Sun ²			25 Mon ¹			
Weather													
River Stage (ft)	1.37			2.01			2.12			1.95			
Air Temperature (C)				+4.0 +3.0									
Water Temperature (C)				0.0 +0.5									
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:												TOTAL	
Anglers													
Fish Caught													
Fish Kept													
Hours Fished													
Catch/Effort (h)													
Day Totals:													
Anglers													
Fish Caught													
Fish Kept													
Hours Fished													
Catch/Effort (h)													
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total

¹ Surveys not conducted due to ice.² Survey not conducted due to darkness.

Table 9.2-3

Creel survey data from the East Dam for each survey day in January 1982.

Day	2 Sat ¹			8 Fri Clear			17 Sun ²			25 Mon ¹			
Weather													
River Stage (ft)	1.37			2.01			2.15			1.95			
Air Temperature (C)				+3.0 +2.5									
Water Temperature (C)				+0.5 0.5									
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:												TOTAL	
Anglers													
Fish Caught													
Fish Kept													
Hours Fished													
Catch/Effort (h)													
Day Totals:													
Anglers													
Fish Caught													
Fish Kept													
Hours Fished													
Catch/Effort (h)													
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total

¹ Surveys not conducted due to ice.² Survey not conducted due to darkness.

Table 9.2-4

Creel survey data from the YHGS for each survey day in January 1982.

Day	2 Sat			8 Fri			17 Sun			25 Mon		
Weather	Clear			Partly Cloudy, Clear			Clear			Clear		
River Stage (ft)	1.37			1.01			2.13			1.96		
Air Temperature (C)	1.5	2.0	+0.5	+1.5	+1.0	+3.0	+18.0	+18.5	+17.0	+7.5	+6.5	+8.0
Water Temperature (C)	1.0	1.0	0.0	0.5	0.5	0.5	*	*	*	*	*	*
Times:												
a) morning (0900-1300)	a			a			a			a		
b) afternoon (1301-1700)	b			b			b			b		
c) evening (1701-2100)	c			c			c			c		
Total Per Time Period:												TOTAL
Anglers	2	3	4	-	-	-	-	-	-	-	-	9
Fish Caught	-	-	-	-	-	-	-	-	-	-	-	-
Fish Kept	-	-	-	-	-	-	-	-	-	-	-	-
Hours Fished	-	2.00	2.15	-	-	-	-	-	-	-	-	-
Catch/Effort (h)	-	-	-	-	-	-	-	-	-	-	-	4.15
Day Totals:												
Anglers	9			-			-			-		
Fish Caught	-			-			-			-		
Fish Kept	-			-			-			-		
Hours Fished	4.15			-			-			-		
Catch/Effort (h)	-			-			-			-		
Species	a	b	c	a	b	c	a	b	c	a	b	c
* Ice present.												

Table 9.2-5

Creel survey data from the YHGS for each survey day in February 1982.

Day	2 Tue			7 Sun			20 Sat			26 Fri		
Weather	Haze, Overcast			Clear			Overcast			Clear		
River Stage (ft)	2.15			2.75			1.84			1.65		
Air Temperature (C)	1.0	2.0	0.0	+4.0	1.0	+1.0	4.0	5.0	3.0	+3.5	1.0	0.5
Water Temperature (C)	*	*	*	*	*	*	1.0	1.5	1.5	0.5	0.5	0.5
Times:												
a) morning (0900-1300)	a			a			a			a		
b) afternoon (1301-1700)	b			b			b			b		
c) evening (1701-2100)	c			c			c			c		
Total Per Time Period:												TOTAL
Anglers	-	-	-	1	2	-	1	5	2	-	-	2
Fish Caught	-	-	-	-	-	-	-	2	-	-	-	7
Fish Kept	-	-	-	-	-	-	-	-	-	-	-	-
Hours Fished	-	-	-	0.35	1.00	-	1.00	9.00	1.00	-	-	4.50
Catch/Effort (h)	-	-	-	-	-	-	-	0.22	-	-	-	0.44
Day Totals:												
Anglers	-			3			8			2		
Fish Caught	-			-			2			2		
Fish Kept	-			-			-			-		
Hours Fished	-			1.35			11.00			4.50		
Catch/Effort (h)	-			-			0.18			0.44		
Species	a	b	c	a	b	c	a	b	c	a	b	c
Yellow	-	-	-	-	-	-	-	2R	-	-	-	2R
* Ice present.												
† Released.												

Table 9.2-6

Creel survey data from the GR for each survey day in March 1982.

Day	7 Sun ¹			11 Thu			24 Wed			27 Sat ²		
Weather				Fog, Clear, Overcast			Clear, Clear Windy					
River Stage (ft)	1.38			1.30			2.90			2.85		
Air Temperature (C)				8.5	8.5		8.0	11.0	11.0			
Water Temperature (C)				3.5	3.3		8.0	8.0	8.5			
Times:												
a) morning (0900-1300)	a			a ³			a			a		
b) afternoon (1301-1700)	b			b			b			b		
c) evening (1701-2100)	c			c			c			c		
Total Per Time Period:												TOTAL
Anglers	-			NO SURVEY			-			2		
Fish Caught	-			-			-			2		
Fish Kept	-			-			-			-		
Hours Fished	-			-			-			0.50		
Catch/Effort (h)	-			-			-			0.50		
Day Totals:												
Anglers	-			-			-			2		
Fish Caught	-			-			-			2		
Fish Kept	-			-			-			-		
Hours Fished	-			-			-			0.50		
Catch/Effort (h)	-			-			-			0.50		
Species	a	b	c	a	b	c	a	b	c	a	b	c
Total												

¹ Surveys not conducted due to ice.² Surveys not conducted due to high winds.³ Survey not conducted due to dense fog.

Table 9.2-7

Creel survey data from the West Dam for each survey day in March 1962.

Weather	7 Sun ¹			11 Thu			24 Wed			27 Sat ²		
River Stage (m)	1.28			1.20			1.00			2.86		
Air Temperature (C)				8.0	8.2		8.0	11.0	11.0			
Water Temperature (C)				3.2	3.2		6.0	6.0	6.5			
Times:												
a) morning (0900-1300)	a			a ³			a			a		
b) afternoon (1301-1700)		b			b			b			b	
c) evening (1701-2100)			c			c			c			c
Total Per Time Period:												TOTAL
Anglers				NO SURVEY	-	-	-	-	-	-	-	-
Fish Caught					-	-	-	-	-	-	-	-
Fish Kept					-	-	-	-	-	-	-	-
Hours Fished					-	-	-	-	-	-	-	-
Catch/Effort (h)					-	-	-	-	-	-	-	-
Day Totals:												
Anglers					-	-	-	-	-	-	-	-
Fish Caught					-	-	-	-	-	-	-	-
Fish Kept					-	-	-	-	-	-	-	-
Hours Fished					-	-	-	-	-	-	-	-
Catch/Effort (h)					-	-	-	-	-	-	-	-
Species	a	b	c	a	b	c	a	b	c	a	b	c

1 Surveys not conducted due to ice.

2 Surveys not conducted due to high winds.

3 Survey not conducted due to dense fog.

Table 9.2-8

Creel survey data from the East Dam for each survey day in March 1962.

Day	7 Sun ¹			11 Thu			24 Wed			27 Sat ²		
Weather				Fog, Clear, Overcast			Clear					
River Stage (m)	1.28			1.20			2.90			2.86		
Air Temperature (C)				9.5	9.0		10.5	13.0	11.5			
Water Temperature (C)				6.0	6.0		6.5	6.5	6.5			
Times:												
a) morning (0900-1300)	a			a ³			a			a		
b) afternoon (1301-1700)		b			b			b			b	
c) evening (1701-2100)			c			c			c			c
Total Per Time Period:												TOTAL
Anglers				NO SURVEY	3	1	-	-	2	-	-	6
Fish Caught					-	-	-	-	-	-	-	-
Fish Kept					-	-	-	-	-	-	-	-
Hours Fished					-	0.15	-	-	1.00	-	-	1.15
Catch/Effort (h)					-	-	-	-	-	-	-	-
Day Totals:												
Anglers					4			2				
Fish Caught					-	-		-	-			
Fish Kept					-	-		-	-			
Hours Fished					0.15			1.00				
Catch/Effort (h)					-	-		-	-			
Species	a	b	c	a	b	c	a	b	c	a	b	c

1 Surveys not conducted due to ice.

2 Surveys not conducted due to high winds.

3 Survey not conducted due to dense fog.

Table 9.2-9

Creel survey data from the YHGS for each survey day in March 1982.

Day	7 Sun			11 Thu			24 Wed			27 Sat			
Weather	Heavy Snow			Fog, Partly Cloudy, Overcast			Clear, Clear Windy			Partly Cloudy Windy			
River Stage (m)	1.28			1.30			2.20			2.86			
Air Temperature (C)	1.5	1.0	1.0	4.0	10.5	8.5	11.0	14.0	12.5	1.0	3.0	1.5	
Water Temperature (C)	1.5	1.2	1.2	3.2	3.5	4.7	6.0	6.5	6.5	6.5	6.5	6.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:													TOTAL
Anglers	-	-	1	3	5	6	4	2	2	2	-	-	25
Fish Caught	-	-	-	-	36	-	-	2	-	-	-	-	38
Fish Kept	-	-	-	-	2	-	-	-	-	-	-	-	2
Hours Fished	-	-	0.35	1.40	20.50	1.80	0.15	4.00	0.30	8.00	-	-	36.30
Catch/Effort (h)	-	-	-	-	1.75	-	-	0.50	-	-	-	-	1.05
Day Totals:													
Anglers		1			14			8			2		
Fish Caught		-			36			2			-		
Fish Kept		-			2			-			-		
Hours Fished		0.35			23.50			4.45			8.00		
Catch/Effort (h)		-			1.53			0.62			-		
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Channel catfish	-	-	-	-	5R	-	-	-	-	-	-	-	5R
Yellow perch	-	-	-	-	1R	-	-	-	-	-	-	-	1R
Walleys	-	-	-	-	1R 29R	-	-	2R	-	-	-	-	1R 31R
K Kept.													32
R Released.													

Table 9.2-10

Creel survey data from the CR for each survey day in April 1982.

Day	4 Sun ¹			12 Mon			17 Sat ¹			20 Thu			
Weather	Clear			Clear			Clear			Clear			
River Stage (m)	2.75			1.92			1.89			1.52			
Air Temperature (C)				8.5	17.0	11.0				NA	16.5	17.5	
Water Temperature (C)				7.0	8.0	8.5				NA	16.0	16.0	
Times:													
a) morning (0900-1300)	a			a			a			a ²			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:													TOTAL
Anglers				3	6	2				5	3	5	24
Fish Caught				-	8	2				9	1	41	61
Fish Kept				-	6	-				-	-	7	13
Hours Fished				2.50	7.25	4.50				6.75	2.50	11.33	34.83
Catch/Effort (h)				-	1.10	0.94				1.33	0.40	3.62	1.75
Day Totals:													
Anglers					11						13		
Fish Caught					10						51		
Fish Kept					6						7		
Hours Fished					14.25						20.13		
Catch/Effort (h)					0.70						2.68		
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Fallfish	-	-	-	-	-	2R	-	-	-	-	-	-	2R
Channel catfish	-	-	-	-	4R	-	-	-	-	2R	-	-	1R 2R
Rock bass	-	-	-	-	1R	-	-	-	-	1R	-	5R	2R
Sunfishes (<i>Lepomis</i> spp.) ⁴	-	-	-	-	-	-	-	-	-	-	1R	4R	5R
Smallmouth bass	-	-	-	-	1R 1R	-	-	-	-	6R	-	2R 27R	7R 34R
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	3R	3R

¹ Surveys not conducted due to high wind conditions.² General identification.³ Incomplete survey due to boat motor failure.

K Kept.

R Released.

NA Not Available.

Table 8.2-11

Creel survey data from the west bay for each survey day in April 1962.

Other	4 Sun ¹			12 Mon			17 Sat ¹			29 Thu			TOTAL
	a	b	c	a	b	c	a	b	c	a	b	c	
River Stage (ft)	2.75			1.91			1.89			1.32			
Air Temperature (C)	8.0			12.0	12.0		12.0			18.0	19.0		
Water Temperature (C)	7.0			8.0	8.5		14.0			15.0			
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1300-1700)		b			b			b			b		
c) evening (1700-2100)			c			c			c			c	
Total Per Time Period:													
Anglers	-			-			-			-			8
Fish Caught	-			-			-			-			104
Fish Kept	-			-			-			-			13
Hours Fished	-			-			-			-			14.33
Catch/Effort (h)	-			-			-			-			8.70
Day Totals:													
Anglers	-			-			-			-			8
Fish Caught	-			-			-			-			154
Fish Kept	-			-			-			-			17
Hours Fished	-			-			-			-			14.33
Catch/Effort (h)	-			-			-			-			9.70
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Clester shad	-	-	-	-	-	-	-	-	-	-	-	-	18
White sucker	-	-	-	-	-	-	-	-	-	18	-	-	18
Shorthead redhorse	-	-	-	-	-	-	-	-	-	18	-	-	18
Rock bass	-	-	-	-	-	-	-	-	-	12 ²	-	-	12 ²
Smallmouth bass	-	-	-	-	-	-	-	-	-	50	42 ²	80	172
Walleye	-	-	-	-	-	-	-	-	-	15 ²	9 ²	-	24 ²

1 Surveys not conducted due to high wind conditions.

2 Survey not conducted due to boat motor failure.

K Kept.

R Released.

Table 8.2-12

Creel survey data from the east bay for each survey day in April 1962.

Other	4 Sun ¹			12 Mon			17 Sat ¹			29 Thu			TOTAL
	a	b	c	a	b	c	a	b	c	a	b	c	
River Stage (ft)	2.75			1.91			1.89			1.32			
Air Temperature (C)	7.5			12.0	12.0		12.0			18.0	19.0		
Water Temperature (C)	6.0			6.0	8.5		12.0			14.0	14.5		
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1300-1700)		b			b			b			b		
c) evening (1700-2100)			c			c			c			c	
Total Per Time Period:													
Anglers	-			8	2	7	-			12	3	6	38
Fish Caught	-			-			-			18	27	12	61
Fish Kept	-			-			-			3	20	11	37
Hours Fished	-			4.00	1.25	5.50	-			11.50	3.75	6.00	32.00
Catch/Effort (h)	-			-			-			1.57	7.20	2.00	1.91
Day Totals:													
Anglers	-			11			-			21			
Fish Caught	-			4			-			57			
Fish Kept	-			1			-			39			
Hours Fished	-			10.75			-			21.25			
Catch/Effort (h)	-			0.37			-			2.68			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Clester shad	-	-	-	-	-	-	-	-	-	18	-	-	18
Northern hog sucker	-	-	-	-	-	-	-	-	-	-	18	-	18
Yellow perch	-	-	-	-	-	-	-	-	-	-	28	28	56
Rock bass	-	-	-	-	-	-	-	-	-	18	38	48	104
Redbreast sunfish	-	-	-	-	-	-	-	-	-	18	18	28	64
Green sunfish	-	-	-	-	-	-	-	-	-	28	-	28	56
Pumpkinseed	-	-	-	-	-	-	-	-	-	13 ²	-	13 ²	26
Bluegill	-	-	-	-	-	-	-	-	-	38	28	58	124
Sunfishes (Lepomis spp.) ²	-	-	-	-	-	18	-	-	-	-	-	-	18
Smallmouth bass	-	-	-	-	-	18	-	-	-	38	28	18	84
Walleye	-	-	-	-	-	28	-	-	-	11 ²	48	-	69

1 Surveys not conducted due to high wind conditions.

2 General identification.

K Kept.

R Released.

Table 9.2-13

Creek survey data from the YHCR for each survey day in April 1982.

Day	4 Sun			12 Mon			17 Sat			24 Fri			
Weather	Partly Cloudy Windy			Clear			Partly Cloudy Windy			Clear			
River Stage (m)	2.75			1.92			1.89			1.92			
Air Temperature (C)	11.0	11.0	11.5	10.5	12.0	11.5	23.0	21.5	24.5	17.0	17.0	17.0	
Water Temperature (C)	10.0	9.5	9.0	8.5	9.5	9.5	15.5	16.0	17.5	13.5	15.0	15.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	TOTAL
Total Per Time Period:													
Anglers	-	3	2	7	8	-	2	14	8	5	9	6	66
Fish Caught	-	-	-	2	-	-	7	9	9	29	12	15	83
Fish Kept	-	-	-	-	-	-	-	2	9	6	5	9	32
Hours Fished	-	0.25	0.33	5.30	3.33	-	8.30	20.75	11.25	3.75	4.75	24.00	85.40
Catch/Effort (h)	-	-	-	0.37	-	-	0.87	0.43	0.80	2.00	2.33	0.63	0.57
Day Totals:													
Anglers		5			19			26			20		
Fish Caught		-			2			23			56		
Fish Kept		-			-			12			20		
Hours Fished		0.58			8.85			40.90			34.68		
Catch/Effort (h)		-			0.20			0.62			1.62		
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	-	-	-	-	-	-	-	5K	1K	-	-	1K	2K
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	1K	-	1K
Brown bullhead	-	-	-	-	-	-	-	-	-	-	-	-	-
Bullhead catfishes (ictalurinae)	-	-	-	-	-	-	-	3K	-	-	-	-	3K
Rock bass	-	-	-	-	-	-	1K	1K	2K	-	3K	1K 2K	6K
Redbreast sunfish	-	-	-	-	-	-	-	-	1K	-	-	-	1K
Smallmouth bass	-	-	-	-	-	-	2K	-	3K	6K 17K	2K 4K	5K	18K
Yellow perch	-	-	-	-	-	-	1K	-	-	-	-	1K	1K
Walleye	-	-	-	2K	-	-	3K	-	-	6K	3K	1K	15K

1 General identification.

K Kept.

R Released.

Table 9.2-14

Creek survey data from the CR for each survey day in May 1982.

Day	2 Sun			11 Tue			15 Sat			26 Wed			
Weather	Clear, Partly Cloudy			Clear			Clear			Fog, Haze, Clear			
River Stage (m)	1.42			1.26			1.28			1.45			
Air Temperature (C)	17.0	21.5	20.0	17.1	23.5	21.5	21.0	24.5	21.0	20.5	23.5	23.5	
Water Temperature (C)	17.0	16.5	17.0	16.5	17.5	18.5	18.5	22.5	23.0	18.5	20.0	21.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	TOTAL
Total Per Time Period:													
Anglers	53	55	26	9	5	20	42	24	49	8	6	13	310
Fish Caught	51	75	17	5	3	36	65	97	72	31	27	30	511
Fish Kept	11	14	-	1	1	13	29	25	11	19	10	6	146
Hours Fished	86.65	92.50	30.50	11.25	7.75	19.24	85.50	60.41	57.75	24.50	22.00	28.00	328.05
Catch/Effort (h)	0.61	0.81	0.56	0.44	0.39	1.87	0.76	1.55	1.25	1.27	1.22	1.07	0.97
Day Totals:													
Anglers		134			34			115			27		
Fish Caught		145			44			236			86		
Fish Kept		25			17			69			33		
Hours Fished		209.65			26.24			205.66			74.50		
Catch/Effort (h)		0.69			1.15			1.18			1.18		
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	2K	-	-	-	-	-	1K	-	-	-	-	-	1K
Yellow bullhead/brown bullhead	-	-	1K	-	-	-	-	-	-	-	-	-	1K
Channel catfish	4K 3K	2K	-	2K	-	-	20K 1K	3K 1K	3K 9K	2K 4K	1K	5K 2K	38K
Rock bass	3K 9K	4K 1K	-	1K	-	1K 14K	2K 4K	17K 14K	5K 17K	2K	2K	13K	36K
Redbreast sunfish	-	-	-	-	-	-	-	-	1K	-	-	-	1K
Green sunfish	-	-	-	-	-	-	-	-	-	12K	-	-	12K
Pumpkinseed	-	6K	-	-	-	-	-	-	-	1K	-	-	1K
Bluegill	-	1K	1K	-	-	-	1K	2K	-	-	-	-	4K
Sunfishes (Lepomis spp.) ¹	3K	6K	12K	-	-	3K	2K 1K	-	2K	6K	3K	2K	25K
Smallmouth bass	4K 21K	3K 52K	3K	1K	1K 2K	4K	3K 27K	2K 50K	2K 33K	2K 2K	5K 14K	1K 7K	23K
Largemouth bass	4K	-	-	-	-	-	-	-	1K	-	-	-	1K
White crappie	-	-	-	-	-	-	-	-	-	-	-	-	-
Black crappie	-	-	-	-	-	4K	-	-	-	-	-	-	4K
Crappies (Pomoxis spp.) ¹	-	-	-	-	-	10K	-	-	-	-	-	-	10K
Yellow perch	-	-	-	1K	-	-	-	3K 2K	-	-	1K	-	5K
Walleye	-	-	-	-	-	-	1K	1K	-	-	-	-	2K

1 General identification.

K Kept.

R Released.

Table 8.1-15

Fishe survey data from the West Dam for each survey day 30 May 1982.

Weather	2 Sun			11 Tue			15 Sat			26 Wed			TOTAL
	Clear, Partly Cloudy 1.42			Clear 1.26			Clear 1.28			12K, Haze, Clear 1.42			
River Stage (m)													
Air Temperature (C)	17.0	21.0	21.5	17.5	21.5	20.7	25.5	25.0	24.0	18.0	24.5	25.0	
Water Temperature (C)	16.0	16.5	17.0	16.5	18.0	18.5	21.0	22.0	22.5	18.0	19.0	21.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													
Anglers	9	7	5	9	7	5	20	7	2	4	3		74
Fish Caught	119	96	113	120	86	8	236	24	19	1	2		724
Fish Kept	8	23	-	25	14	1	52	-	2	-	-		134
Hours Fished	30.00	8.41	1.25	24.25	18.00	2.50	77.00	8.75	3.00	-	1.00	6.00	180.16
Catch/Effort (h)	3.97	11.41	7.40	4.95	4.78	3.00	3.08	7.74	6.33	-	1.00	2.00	4.02
Day Totals:													
Anglers	21			19			29			5			
Fish Caught	219			214			274			13			
Fish Kept	33			40			60			1			
Hours Fished	39.66			44.75			88.75			7.00			
Catch/Effort (h)	5.30			4.78			3.14			1.86			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	2K	-	-	-	-	-	1K	-	-	-	-	-	1K 2K
Ouilback	-	-	-	-	-	-	1K	-	-	-	-	-	1K
Northern hog sucker	-	-	-	-	-	-	1K	-	-	-	-	-	1K
Shorthead redhorse	-	2K	-	-	-	-	19K 2K	-	-	-	-	-	19K 4K 2K
Suckers (Catostomidae) ¹	1K	-	-	-	-	-	-	-	-	-	-	-	1K
Channel catfish	-	-	-	2K 12K	4K 3K	-	7K 4K	6K	-	-	-	-	12K 25K 3K
Rock bass	1K	1K	3K	5K 4K	5K	-	5K 10K	4K	1K 2K	-	-	-	11K 30K 4K
Sunfishes (Lepomis spp.) ¹	-	-	-	-	-	-	1K	-	-	-	-	-	1K
Smallmouth bass	8K 4K 25K 3K	-	-	8K 5K	9K 4K	2K	17K 8K	10K	2K 8K	-	-	2K	69K 24K 33K
Crappies (Pomoxis spp.) ¹	-	-	-	-	-	-	1K 9K	-	-	-	-	-	1K 9K
Walleye	6K	32K	-	10K 4K	1K 2K	1K 5K	5K 55K	4K	6K	-	1K	10K	18K 252K 27K

¹ General identification.

K Kept.

R Released.

Table 8.1-16

Fishe survey data from the East Dam for each survey day 26 May 1982.

Weather	2 Sun			11 Tue			15 Sat			26 Wed			TOTAL
	Partly Cloudy 1.42			Clear 1.26			Clear 1.28			Haze, Clear 1.42			
River Stage (m)													
Air Temperature (C)	18.0	22.5	21.5	18.5	24.5	24.5	19.0	25.0	24.0	17.0	24.5	21.5	
Water Temperature (C)	15.0	15.5	16.0	16.5	19.5	19.0	21.0	22.5	22.5	17.5	19.0	20.5	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													
Anglers	15	25	29	2	3	11	10	8	15	5	6	4	133
Fish Caught	41	40	122	11	20	71	35	54	4	28	2	20	448
Fish Kept	14	19	28	5	20	68	22	14	1	2	-	4	193
Hours Fished	17.00	33.33	49.00	3.75	3.75	6.15	26.50	18.75	7.00	7.50	7.33	16.00	199.06
Catch/Effort (h)	2.41	1.20	2.49	2.93	3.33	7.78	1.32	2.88	0.57	3.73	0.27	1.25	2.25
Day Totals:													
Anglers	69			16			32			13			
Fish Caught	203			102			93			50			
Fish Kept	59			91			37			6			
Hours Fished	94.33			14.65			52.25			30.63			
Catch/Effort (h)	2.96			6.13			1.78			1.62			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Falcons trout	-	-	-	-	-	-	1K	-	-	-	-	-	1K
Common carp	-	-	-	-	-	-	-	-	-	2K	-	-	2K
Suckers (Catostomidae) ¹	-	-	-	-	-	-	1K	-	-	-	-	-	1K
Yellow bullhead	-	-	-	-	1K	-	-	-	-	-	-	-	1K
Channel catfish	2K	-	2K	-	-	-	10K	-	-	-	-	1K 2K	1K 15K 3K
Rock bass	2K 5K	2K	14K 19K	2K	7K	22K	8K	3K 6K	3K	4K	-	1K 7K	61K 44K 105K
Redbreast sunfish	-	-	-	1K	2K	9K	2K	1K	-	-	1K	-	16K
Green sunfish	-	-	-	-	2K	6K	1K	-	-	-	-	-	9K
Pumpkinseed	-	3K	1K	-	5K	13K	-	1K	-	-	1K	-	24K
Bluegill	-	-	1K	-	3K	13K	-	-	-	-	-	-	16K
Sunfishes (Lepomis spp.) ¹	-	2K	3K	-	-	-	9K	2K	-	-	-	-	14K
Smallmouth bass	12K 19K 14. 14K 11K 6K	2K 6K	-	1K 5K	5K 2K	4K 19K	-	13K	-	2K 8K	-	-	51K 140K 200K
White crappie	-	-	-	-	-	-	4K	1K	-	-	-	-	5K
Black crappie	-	-	-	-	-	2K	2K	2K	1K	-	-	-	7K
Yellow perch	-	-	-	-	-	-	-	1K	-	-	-	-	1K
Walleye	1K	5K	6K	-	-	-	1K	3K	-	9K	-	-	17K 27K 27K

¹ General identification.

K Kept.

R Released.

Table 9.2-17

Creel survey data from the YH2 for each survey day in May 1982.

Day	7 Sun			11 Tue			15 Sat			20 Wed			
Weather	Partly Cloudy			Clear			Clear			Fog, Haze, Clear			
River Stage (m)	1.42			1.28			1.28			1.43			
Air Temperature (C)	21.5	23.5	16.0	20.3	24.0	21.5	22.5	26.0	19.5	16.3	24.5	21.0	
Water Temperature (C)	17.0	17.3	16.5	17.5	19.0	19.5	23.5	23.0	22.5	17.5	21.0	21.0	
Times:	a) morning (0900-1300)			b) afternoon (1301-1700)			c) evening (1701-2100)						
Total Per Time Period:	a	b	c	a	b	c	a	b	c	a	b	c	TOTAL
Anglers	22	24	26	13	19	11	22	36	48	11	17	29	278
Fish Caught	40	51	83	32	46	48	63	50	58	11	15	63	562
Fish Kept	31	19	32	8	23	26	29	32	23	3	6	31	263
Hours Fished	32.00	37.00	55.16	26.33	42.75	29.50	44.25	71.58	92.50	12.00	38.00	57.58	534.71
Catch/Effort (h)	1.23	1.38	1.50	1.22	1.08	1.89	1.67	0.70	0.63	0.92	0.39	1.09	1.05
Day Totals:		72		43			106			57			
Anglers		72		43			106			57			
Fish Caught		174		126			173			89			
Fish Kept		82		57			84			40			
Hours Fished		124.24		94.28			208.33			107.58			
Catch/Effort (h)		1.40		1.33			0.83			0.83			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Clearhead shad	-	-	-	2K	-	-	-	-	-	-	-	-	2K
Common carp	-	3K 1R	-	-	6K	3K 1R	1R	1R	1R	-	2K	-	14K 5R
Dallback	-	-	-	-	-	-	-	3K	-	-	-	-	3K
White sucker	2K	-	-	-	-	-	-	-	-	-	-	-	2K
Shorthead redhorse	1K	1R	-	2R	16K	-	1K	2K	-	-	-	-	18K 5R
Channel catfish	-	-	1R	-	-	1K	25K	8K 4R	7K 9R	-	1K	10K 1R	59K 14R
Rock bass	17K 3R	2K 1R	19K 6R	2K	4R	3K 2R	1K 1R	9K	7K 3R	1K 1R	1K 2R	12K 11R	74K 34R
Redbreast sunfish	-	-	-	-	-	-	-	2K	-	-	-	-	2K
Pumpkinseed	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfishes (<i>Lepomis</i> spp.) ¹	2K	-	-	1R	2R	-	1K	-	-	1K	-	-	2K 5R
Smallmouth bass	10K 4R	14K 25K	10K 40R	4K 7R	7R	2K 13R	1K 21K	5K 9R	9K 9R	1K 5R	2K 6R	2K 7R	80K 163R
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	-	-
White crappie	-	1R	-	-	-	12K	-	1K	-	-	-	-	13K 1R
Black crappie	-	-	-	-	-	5K	-	-	-	-	-	-	5K
Crappies (<i>Pomoxis</i> spp.) ¹	-	-	1K 1R	-	-	-	-	-	-	-	-	-	1K 1R
Yellow perch	-	-	1K	2K 8R	1K 3R	2R	1R	-	-	-	-	-	4K 3R
Walleye	1K	3R	4R	4R	7R	1K 4R	1K 12R	2K 4R	5R	2R	1R	2R	5K 48R

¹ General identification.

K Kept.

R Released.

Table 9.2-18

Creel survey data from the GK for each survey day in June 1982.

Day	5 Sat			16 Wed			22 Tue			27 Sun			
Weather	Heavy Rain			Clear, Partly Cloudy			Clear, Overcast			Haze, Windy			
River Stage (m)	2.06			1.90			1.62			1.33			
Air Temperature (C)	17.0	17.5	16.5	24.5	28.0	28.0	22.0	24.5	26.0	23.0	26.0	24.5	
Water Temperature (C)	17.0	17.0	17.0	18.5	19.5	21.0	21.5	22.5	22.5	23.0	24.0	24.5	
Times:	a) morning (0900-1300)			b) afternoon (1301-1700)			c) evening (1701-2100)						
Total Per Time Period:	a	b	c	a	b	c	a	b	c	a	b	c	TOTAL
Anglers	-	3	-	6	7	-	4	12	8	27	16	5	88
Fish Caught	-	1	-	2K	25	-	1	17	38	32	40	7	189
Fish Kept	-	-	-	8	1	-	5	11	6	1	-	-	32
Hours Fished	-	1.00	-	27.00	6.02	-	4.67	27.00	24.50	37.00	12.25	2.25	141.69
Catch/Effort (h)	-	1.00	-	1.00	4.15	-	0.21	0.63	1.55	0.86	3.26	3.11	1.33
Day Totals:		3		13			24			48			
Anglers		3		13			24			48			
Fish Caught		1		53			56			79			
Fish Kept		-		9			16			7			
Hours Fished		1.00		33.02			58.17			51.50			
Catch/Effort (h)		1.00		1.57			1.00			1.33			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	-	-	-	-	-	-	-	1R	-	-	-	-	1R
Brown bullhead	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	-	-	-	1K 4R	1R	-	1K 1R	6K 7R	1K 6R	-	-	-	1K 14R
Rock bass	-	-	-	5K 4R	1R	-	3K 1R	6R	1K 4R	-	3R	1R	7K 16R
Redbreast sunfish	-	-	-	-	-	-	-	1K	-	-	-	-	1K
Pumpkinseed	-	-	-	-	1R	-	-	-	-	-	-	-	1R
Bluegill	-	-	-	-	-	-	-	4K	-	-	-	-	4K
Sunfishes (<i>Lepomis</i> spp.) ¹	-	-	-	1K	1K 1R	-	-	-	-	1R	-	-	2K 2R
Smallmouth bass	-	-	-	7R	-	-	1R	1K	4R	5R	4R	5R	27K 27R
Largemouth bass	-	-	-	5R	18R	-	-	1K 7R	1K 10R	5K 13R	1K 52R	1R	8K 86R
Crappies (<i>Pomoxis</i> spp.) ¹	-	1K	-	-	2R	-	-	-	-	-	-	-	2K 2R

¹ General identification.

K Kept.

R Released.

Table 9.2-19

Creef survey data from the West Dam for each survey day in June 1982.

Weather	5 Sat Heavy Rain			16 Wed Clear,			21 Tue Clear,			27 Sun Heavy Wind, Thunder		
	2.06			1.90			1.62			1.35		
River Stage (m)												
Air Temperature (C)	18.0	17.5	17.0	22.0	28.5	27.5	22.0	26.5	28.0	23.0	26.0	24.0
Water Temperature (C)	15.5	16.5	16.5	19.0	23.0	23.5	21.5	23.5	23.5	24.0	24.5	25.5
Time:												
a) morning (0900-1300)	a			b			c			d		
b) afternoon (1301-1700)		b			b			b			b	
c) evening (1701-2100)			c		c			c			c	
Total Per Time Period:												TOTAL
Anglers	-	-	-	-	6	-	2	2	-	6	3	-
Fish Caught	-	-	-	-	8	-	1	3	-	7	7	-
Fish Kept	-	-	-	-	-	-	1	-	-	4	-	-
Hours Fished	-	-	-	-	11.00	-	0.50	0.50	-	5.00	7.50	-
Catch/Effort (h)	-	-	-	-	0.73	-	2.00	6.00	-	1.60	0.93	-
Day Totals:												
Anglers	-	-	-	6	-	-	4	-	-	6	3	-
Fish Caught	-	-	-	8	-	-	4	-	-	14	-	-
Fish Kept	-	-	-	-	-	-	1	-	-	4	-	-
Hours Fished	-	-	-	11.00	-	-	1.00	-	-	12.50	-	-
Catch/Effort (h)	-	-	-	0.73	-	-	4.00	-	-	1.12	-	-
Species	a	b	c	d	e	f	g	h	i	j	k	l
Channel catfish	-	-	-	-	3R	-	-	-	-	-	-	-
Rock bass	-	-	-	-	1R	-	-	-	-	-	-	-
Smallmouth bass	-	-	-	-	3R	-	1R	-	-	1R	1R	4R
Largemouth bass	-	-	-	-	-	-	-	-	-	1R	-	-
Walleye	-	-	-	-	1R	-	-	1R	2R	2R	1R	-
R Kept.												
R Released.												

Table 9.2-20

Creef survey data from the East Dam for each survey day in June 1982.

Weather	5 Sat Heavy Rain			16 Wed Clear,			21 Tue Clear,			27 Sun Heavy Windy Rain		
	2.06			1.90			1.62			1.35		
River Stage (m)												
Air Temperature (C)	18.0	18.5	16.5	24.5	28.5	26.5	21.5	27.5	28.5	24.0	26.0	23.5
Water Temperature (C)	16.0	16.0	16.0	18.0	19.5	20.0	21.0	23.5	23.5	24.0	23.5	23.7
Time:												
a) morning (0900-1300)	a			b			c			d		
b) afternoon (1301-1700)		b			b			b			b	
c) evening (1701-2100)			c		c			c			c	
Total Per Time Period:												TOTAL
Anglers	9	12	5	14	11	17	21	11	17	11	9	14
Fish Caught	54	32	19	147	87	14	81	70	67	34	32	16
Fish Kept	7	6	-	47	22	2	23	22	16	2	-	2
Hours Fished	22.25	10.93	7.50	21.50	24.75	3.33	24.68	28.33	21.25	33.00	11.00	10.75
Catch/Effort (h)	2.43	2.93	1.73	7.77	2.30	4.20	3.28	2.67	3.15	1.03	1.09	1.49
Day Totals:												
Anglers	26			35			49			34		
Fish Caught	99			238			218			62		
Fish Kept	13			71			60			4		
Hours Fished	40.68			49.58			74.26			54.75		
Catch/Effort (h)	2.43			4.80			2.94			1.13		
Species	a	b	c	d	e	f	g	h	i	j	k	l
Rainbow trout	-	-	-	-	1R	-	1R	-	-	-	-	-
Brown trout	-	1R	-	-	-	-	-	-	-	-	-	-
Common carp	-	-	-	-	1R	-	-	-	-	-	-	-
Creek chub	-	-	-	1R	-	-	-	-	-	-	-	-
Gullback	-	-	-	-	-	-	-	1R	-	-	-	-
Suckers (Catostomidae) ¹	-	-	-	-	-	-	1R	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	1R	-	-	-	-	-
Channel catfish	7R	-	-	1R	3R	-	-	1R	10R	1R	-	2R
Rock bass	2R	1R	3R	11R	5R	8R	2R	2R	1R	3R	1R	2R
Redbreast sunfish	1R	-	-	3R	1R	-	-	-	-	-	-	-
Green sunfish	-	-	-	2R	-	-	2R	2R	-	-	-	-
Pumpkinseed	1R	-	-	2R	-	-	5R	7R	1R	4R	-	-
Bluegill	-	-	-	13R	1R	-	2R	8R	1R	2R	-	3R
Sunfishes (Lepomis spp.) ¹	1R	-	1R	-	21R	8R	14R	17R	17R	4R	-	1R
Smallmouth bass	2R	1R	4R	25R	3R	8R	14R	10R	2R	15R	1R	25R
Largemouth bass	-	-	-	-	-	-	-	1R	2R	-	-	-
White crappie	1R	1R	-	1R	1R	-	3R	-	2R	1R	-	-
Black crappie	-	-	-	-	-	-	-	-	1R	-	-	-
Crappies (Pomoxis spp.) ¹	-	2R	-	8R	3R	-	-	-	-	-	-	-
Walleye	3R	35R	4R	20R	8R	6R	84R	5R	4R	1R	2R	1R

¹ General identification.

R Kept.

R Released.

Table 9.2-71

Creel survey data from the YMSR for each survey day in June 1982.

Day	5 Sat Heavy Rain, Overcast, Heavy Sulf			18 Wed Clear, Partly Cloudy			22 Tue Partly Cloudy			27 Sun Haze, Cloudy			
River Stage (m)	2.04			1.90			1.62			1.25			
Air Temperature (C)	18.0	19.0	*	30.5	30.3	25.0	25.3	27.0	27.5	27.0	27.5	*	
Water Temperature (C)	16.5	17.0	*	18.3	22.0	21.0	23.0	23.0	22.5	24.5	25.5	*	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	7	5	*	7	6	3	7	21	30	18	15	29	168
Fish Caught	3	16	*	1	*	3	10	34	34	19	21	24	167
Fish Kept	2	7	*	1	*	1	5	15	19	11	10	5	75
Hours Fished	7.00	9.50	*	13.17	0.90	1.50	5.00	28.92	35.74	14.75	27.80	39.50	203.57
Catch/Effort (h)	0.43	1.68	*	0.08	0.00	2.00	2.00	1.18	0.95	1.42	0.76	0.64	0.84
Day Totals:													
Anglers	12			16			38			62			
Fish Caught	19			4			78			66			
Fish Kept	9			2			38			26			
Hours Fished	16.50			15.84			69.66			101.75			
Catch/Effort (h)	1.15			0.26			1.12			0.65			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	2K	7K 7R	-	-	-	-	-	-	-	-	-	-	21
Rock bass	-	-	-	-	-	-	1K	1K	1K	4K 4R	3K 1R	2K	23K 20R
Redbreast sunfish	-	-	-	-	-	-	-	2K	6K 1R	4K	3K	-	15K 1R
Pumpkinseed	-	-	-	-	-	-	-	4K	1K	-	1K	-	6K
Bluegill	-	-	-	-	-	-	-	2K	-	-	2K	-	4K
Sunfishes (<i>Lepomis</i> spp.) ¹	-	-	-	-	-	-	-	2K	-	-	1K	-	3K
Smallmouth bass	-	-	-	-	-	-	-	6R	-	-	-	2K	8R
White crappie	-	-	-	-	-	1R	3K 3R	1K 9R	6R	2K 4R	5R	3R	6K 33R
Black crappie	-	-	-	-	-	-	-	2R	6K	-	-	-	8K
Yellow perch	-	-	-	-	-	1K	-	-	-	-	-	-	1K
Walleye	1K	2R	-	-	-	-	-	2R	-	1K	-	-	1K 2R
							1K 2R	2R	3R	1K 3R	-	-	2K 13R

¹ General identification.

K Kept.

R Released.

Table 9.2-72

Creel survey data from the GR for each survey day in July 1982.

Day	6 Tue Clear			11 Sun Overcast, Partly Cloudy			16 Fri Haze			31 Sat Overcast, Heavy Rain			
River Stage (m)	1.42			1.22			1.12			1.07			
Air Temperature (C)	21.5	25.5	27.5	25.0	27.0	28.0	28.0	31.5	31.5	26.5	28.5	24.5	
Water Temperature (C)	22.5	23.0	23.0	27.0	27.0	27.5	28.5	29.5	29.5	25.5	26.5	25.5	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	12	13	12	37	43	20	6	7	7	24	9	-	190
Fish Caught	25	36	2	104	40	31	15	23	-	26	8	-	310
Fish Kept	10	-	-	17	12	6	-	-	-	4	2	-	53
Hours Fished	24.66	9.18	10.25	58.75	61.90	35.32	6.50	20.00	2.25	43.50	14.00	-	286.31
Catch/Effort (h)	1.01	3.92	0.20	1.77	0.63	0.88	2.31	1.15	-	0.60	0.57	-	1.08
Day Totals:													
Anglers	37			100			20			33			
Fish Caught	63			175			38			34			
Fish Kept	10			37			6			6			
Hours Fished	44.09			155.97			28.75			57.50			
Catch/Effort (h)	1.43			1.12			1.32			0.59			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Muskellunge	-	-	-	-	-	-	-	-	-	-	-	-	1R
Common carp	-	-	-	1R	1K	-	-	-	-	-	-	-	2R
Brown bullhead	-	-	-	-	-	-	-	-	-	1K	-	-	1K
Channel catfish	-	-	-	-	1K	-	-	-	-	-	-	-	1K
Rock bass	8R	10R	-	4K 1R	5K 7R	1K 1R	-	2R	-	1K	1R	-	4K 7K 11
Pumpkinseed	-	-	-	-	-	-	1R	-	-	-	-	-	11K 32R
Bluegill	-	-	-	-	-	-	-	-	-	-	2K	-	2K
Sunfishes (<i>Lepomis</i> spp.) ¹	9K 1R	2R	-	-	1K	-	-	-	-	-	-	-	1K
Smallmouth bass	1K 6K	24R	2R	1K	3R	-	-	-	-	2R	-	-	9K 9R 1R
Crappies (<i>Pomoxis</i> spp.) ¹	-	-	-	10K 78R	5K 18R	6K 19R	14R	17R	-	2K 20R	5R	-	24K 203R 227
								3R	-	-	-	-	1 3R

¹ General identification.

K Kept.

R Released.

Table 9.2-23

Creel survey data from the West Dam for each survey day in July 1982.

Weather	6 Tue Clear			11 Sun Overcast			16 Fri Haze			21 Sat Overcast, Heavy Rain			
River Stage (m)	1.52			1.22			1.27						
Air Temperature (C)	20.3	26.0	21.3	25.3	27.0	27.0	28.0	32.0	32.0	26.3	29.3	24.3	
Water Temperature (C)	21.0	22.5	26.0	28.2	27.0	28.0	28.3	32.0	31.0	29.0	26.2	26.3	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	-	1	2	4	5	14	-	-	-	3	2	-	34
Fish Caught	-	2	12	41	44	31	-	-	-	26	-	-	144
Fish Kept	-	-	-	1	-	4	-	-	-	-	-	-	5
Hours Fished	-	0.25	8.00	10.00	6.50	24.75	6.00	-	-	7.50	1.00	-	65.00
Catch/Effort (h)	-	8.00	1.33	4.10	6.77	1.23	1.67	-	-	3.47	-	-	2.33
Day Totals:													
Anglers	4			23			6			2			
Fish Caught	14			116			10			26			
Fish Kept	-			5			3			-			
Hours Fished	9.25			41.25			6.00			8.50			
Catch/Effort (h)	7.51			2.81			1.67			3.06			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	-	-	-	-	-	-	-	-	-	1K	-	-	1K
Channel catfish	-	1K	4K	24K	11K	-	1K 3K	-	-	15K	-	-	1K 60K 61
Rock bass	-	1K	1K	2K	3K	-	2K	-	-	-	-	-	2K 7K 9
Sunfishes (Lepomis spp.) ¹	-	-	-	1K	-	1K	-	-	-	5K	-	-	7K 7
Smallmouth bass	-	-	6K	8K	18K	21K	4K	-	-	5K	-	-	62K 62
Walleye	-	-	1K	1K 3K	12K	4K 1K	-	-	-	-	-	-	5K 21K 26

¹ General identification.

K Kept.

R Released.

Table 9.2-24

Creel survey data from the East Dam for each survey day in July 1982.

Day	6 Tue Clear			11 Sun Overcast, Partly Cloudy			16 Fri Haze			21 Sat Partly Cloudy, Heavy Rain			
River Stage (m)	1.57			1.22			1.17						
Air Temperature (C)	21.5	25.5	30.0	25.0	27.5	26.5	31.5	27.5	31.5	26.3	29.5	24.0	
Water Temperature (C)	21.5	22.5	23.5	26.5	26.5	26.5	29.5	25.0	29.5	26.0	26.0	26.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													Total
Anglers	9	7	10	1	10	8	-	-	7	9	-	-	60
Fish Caught	26	9	23	1	21	7	-	-	7	4	-	-	131
Fish Kept	8	1	2	1	1	1	2	2	-	1	-	-	19
Hours Fished	20.47	7.50	7.25	1.50	16.00	7.00	4.25	1.50	-	3.00	3.00	-	82.17
Catch/Effort (h)	1.74	1.20	2.97	0.67	1.31	1.00	3.76	4.67	-	0.54	1.33	-	1.59
Day Totals:													
Anglers	26			19			5			10			
Fish Caught	68			29			23			11			
Fish Kept	11			3			4			1			
Hours Fished	35.92			24.50			5.75			16.00			
Catch/Effort (h)	1.89			1.18			4.00			0.69			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Muskellunge	1K	-	-	-	-	-	-	-	-	-	-	-	1K 1
Channel catfish	-	-	-	5K	1K 1K	-	-	-	-	1K 3K	2K	-	2K 11K 13
Rock bass	2K	1K	3K	-	-	-	-	-	-	-	-	-	2K 4K 6
Bluegill	-	-	-	-	-	-	1K	-	-	-	-	-	1K 1
Sunfishes (Lepomis spp.) ¹	1K	2K	7K	-	1K	-	-	-	-	1K	2K	-	1K 2K 14
Smallmouth bass	3K 6K	5K	5K	1K	1K 14K	5K	2K 12K	5K	-	2K	-	-	7K 52K 59
Largemouth bass	1K	-	-	-	-	-	-	-	-	-	-	-	1K 1
Black creppie	-	-	-	-	-	-	-	2K	-	-	-	-	2K 2
Walleye	2K 20K	1K 2K	2K 1K	-	-	-	1K	-	-	-	-	-	5K 29K 35

¹ General identification.

K Kept.

R Released.

Table 9.2-25

Creel survey data from the YNOR for each survey day in July 1982.

Day	8 Tue			11 Sun			16 Fri			21 Sat			
Weather	Clear			Overcast, Partly Cloudy			Haze			Overcast, Heavy Rain			
River Stage (m)	1.42			1.22			1.17			1.07			
Air Temperature (C)	22.5	24.0	27.5	27.0	28.5	28.5	30.5	31.0	30.5	28.5	30.0	28.5	
Water Temperature (C)	22.5	24.0	24.5	26.5	27.0	28.5	29.0	30.0	28.0	27.0	27.0	25.5	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	8	12	27	19	26	19	8	7	13	11	12	4	
Fish Caught	4	34	46	44	28	17	59	6	4	4	11	-	166
Fish Kept	-	4	27	8	11	9	14	2	2	3	1	-	257
Hours Fished	19.00	32.16	36.75	42.00	38.16	40.31	23.00	6.00	21.50	17.00	18.25	1.00	83
Catch/Effort (h)	0.14	1.06	1.25	1.05	0.72	0.42	2.56	1.00	0.19	0.26	0.60	-	305.33
Day Totals:													
Anglers	47			64			28			27			
Fish Caught	84			89			69			15			
Fish Kept	33			28			18			4			
Hours Fished	97.91			120.67			50.50			36.25			
Catch/Effort (h)	0.86			0.74			1.37			0.41			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Muskellunge	-	-	-	-	-	-	-	-	-	-	-	-	-
Common carp	2R	6R	-	-	1R	6R	1R	-	-	-	-	-	1R
Channel catfish	-	2K	12K 1R	3K 9R	1K	1K 2R	1R	2K 4R	1K 1R	2K	2R	-	7K 6R
Rock bass	-	-	10K	4R	1R	-	-	-	-	-	-	-	24K 20R
Redbreast sunfish	-	-	2K	-	-	-	-	-	-	-	-	-	11K 5R
Bluegill	-	-	-	-	-	-	-	-	-	-	-	-	2K
Sunfishes (<i>Lepomis</i> spp.) ¹	-	3K 1R	1R	1K	1K 4R	1K 2R	-	-	-	-	1K	-	1K
Smallmouth bass	2R	19R	2K 11R	4R 14R	11R	1R 2R	7K 8R	-	1K 1R	1R	8R	-	6K 6R
Crapplies (<i>Pomoxis</i> spp.) ¹	-	-	2R	-	-	2R	-	-	-	-	-	-	13K 77R
Yellow perch	-	1K	-	-	-	-	-	-	-	-	-	-	4R
Walleye	-	2R	1K 4R	9R	8K 1R	-	7K 35R	-	-	-	-	-	1K

¹ General identification.

K Kept.

R Released.

Table 9.2-26

Creel survey data from the OR for each survey day in August 1982.

Day	5 Thu			14 Sat			27 Sun			30 Mon			
Weather	Haze			Partly Cloudy			Clear, Partly Cloudy			Overcast, Partly Cloudy, Windy			
River Stage (m)	1.08			1.07			0.99			0.99			
Air Temperature (C)	28.0	32.0	32.0	24.0	25.5	24.5	17.0	20.0	21.5	16.5	21.5	23.0	
Water Temperature (C)	27.0	27.5	29.0	23.5	24.5	24.0	22.5	24.0	24.0	20.0	21.5	22.2	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	8	2	7	28	5	6	42	27	14	5	5	17	
Fish Caught	33	2	17	86	1	-	187	157	37	28	1	20	166
Fish Kept	1	-	11	16	-	-	2	2	6	2	-	2	569
Hours Fished	12.75	2.00	14.00	71.50	8.25	1.00	113.02	63.17	24.84	18.50	2.00	46.34	44
Catch/Effort (h)	2.59	1.00	1.21	1.20	0.12	-	1.65	2.48	1.49	1.51	0.50	0.45	375.37
Day Totals:													
Anglers	17			37			85			27			
Fish Caught	52			87			381			49			
Fish Kept	12			16			10			4			
Hours Fished	28.75			80.75			201.03			64.84			
Catch/Effort (h)	1.81			1.08			1.90			0.76			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	-	-	-	-	-	-	-	2R	-	-	-	-	2R
Fallfish	-	-	-	1R	-	-	-	-	-	-	-	-	1R
Channel catfish	1K 26R	-	1K	1K 1R	-	-	14R	17R	1K 1R	-	-	-	4K 60R
Rock bass	1R	-	3K	5K 5R	-	-	41R	32R	1K 2R	-	-	2R	9K 84R
Redbreast sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1R
Sunfishes (<i>Lepomis</i> spp.) ¹	-	1R	-	2K 1R	-	-	12R	6R	2R	-	1R	-	1R
Smallmouth bass	5R	1R	7K 6R	8K 60R	1R	-	2K 116R	2K 97R	4K 26R	2K 26R	-	6R	2K 28R
Crapplies (<i>Pomoxis</i> spp.) ¹	-	-	-	-	-	-	1R	1R	-	-	-	2K 9R	27K 347R
Walleye	-	-	-	2R	-	-	-	-	-	-	-	-	2R

¹ General identification.

K Kept.

R Released.

Table 9.2-29

Creel survey data from the YHSE for each survey day in August 1982.

Day	5 Thu			14 Sat			22 Sun			30 Mon			
Weather	Haze			Partly Cloudy			Clear, Partly Cloudy			Partly Cloudy, Clear			
River Stage (m)	1.08			1.07			0.99			0.99			
Air Temperature (C)	28.1	33.0	30.5	24.0	28.5	20.5	17.0	21.5	21.0	20.0	22.5	21.5	
Water Temperature (C)	28.0	30.0	27.5	25.5	25.5	23.0	23.0	24.5	22.5	25.5	23.0	22.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:													TOTAL
Anglers	2	19	20	10	17	21	12	15	26	3	9	16	147
Fish Caught	-	17	21	17	5	14	11	129	46	2	6	13	281
Fish Kept	-	14	16	16	2	5	9	15	8	2	-	8	100
Hours Fished	7.00	41.50	41.50	28.00	19.75	48.50	18.25	48.00	44.00	3.00	11.68	21.42	335.90
Catch/Effort (h)	-	0.40	0.51	0.61	0.25	0.28	1.60	2.68	1.00	0.67	0.51	0.51	0.83
Day Totals:													
Anglers		41			44			54			28		
Fish Caught		38			36			189			21		
Fish Kept		30			23			33			14		
Hours Fished		91.00			96.25			113.25			38.10		
Catch/Effort (h)		0.42			0.37			1.66			0.52		
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	-	-	-	-	-	1R	6R	-	1R	-	-	-	6R 2R 8
Gullback	-	-	-	-	-	-	-	2R	-	-	-	-	2R - 2
Channel catfish	-	6R 2R	6R 2R	16R	1R 2R	3R	3R 2R	10R 50R	1R 2R	-	-	-	66R 60R 106
Rock bass	-	3R	3R	-	-	1R	-	1R	-	-	1R	-	9R - 9
Neotraycut sunfish	-	-	-	-	-	-	-	-	-	1R	1R	-	2R - 2
Pumpkinseed	-	-	-	-	-	-	-	-	-	-	-	1R	1R - 1
Bluegill	-	-	-	-	-	-	-	-	-	-	-	5R	5R - 5
Sunfishes (<i>Lepomis</i> spp.) ¹	-	4R	-	1R	-	3R	-	2R	3R	-	-	2R	6R 9R 15
Smallmouth bass	-	1R	1R 1R	-	1R	4R	-	61R	4R 23R	-	2R	2R	5R 95R 100
Largemouth bass	-	-	1R	-	-	-	-	-	-	-	-	-	1R - 1
White crappie	-	-	5R	-	-	-	-	-	-	-	-	-	5R - 5
Black crappie	-	-	-	-	-	1R	-	-	-	1R	1R	1R 1R	5R 1R 6
Crappies (<i>Pomoxis</i> spp.) ¹	-	1R	-	-	-	-	-	-	-	3R	-	-	4R - 4
Yellow perch	-	-	-	-	-	1R	-	-	-	-	-	1R	1R 1R 2
Walleye	-	-	2R	-	1R	-	-	3R	5R	-	1R	-	2R 13R 15

¹ General identification.

R Kept.

R Released.

Table 9.2-30

Creel survey data from the GK for each survey day in September 1982.

Day	9 Wed			12 Sun			25 Sat			27 Mon			
Weather	Overcast			Fog, Overcast			Fog, Partly Cloudy, Overcast			Overcast, Partly Cloudy			
River Stage (m)	0.91			0.93			0.96			0.97			
Air Temperature (C)	18.1	17.0	18.0	22.5	29.0	26.5	17.0	20.5	18.5	17.5	21.0	20.0	
Water Temperature (C)	21.5	21.5	21.5	23.0	24.5	24.5	19.0	19.5	19.0	17.5	17.5	18.5	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:													TOTAL
Anglers	6	5	7	19	11	19	20	21	14	-	3	3	128
Fish Caught	25	17	5	64	22	63	32	71	24	-	1	12	336
Fish Kept	4	5	-	15	8	4	2	9	5	-	-	-	53
Hours Fished	8.17	16.18	2.92	44.00	14.50	56.50	18.51	41.68	33.16	-	4.50	6.00	246.12
Catch/Effort (h)	3.06	1.05	1.71	1.45	1.52	1.12	1.73	1.70	0.72	-	0.22	2.00	1.36
Day Totals:													
Anglers		18			49			51			6		
Fish Caught		47			149			127			13		
Fish Kept		9			28			16			-		
Hours Fished		27.27			113.00			93.35			10.50		
Catch/Effort (h)		1.72			1.30			1.36			1.24		
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	-	-	-	-	-	-	-	-	-	-	-	1R	1R 1
Channel catfish	1R	1R	-	4R 5R	1R	1R	-	-	2R 4R	-	-	-	8R 11R 19
Rock bass	2R	2R	-	1R	2R	6R	1R 2R	1R 6R	1R 1R	-	-	4R	7R 22R 29
Bluegill	-	-	-	1R 2R	-	1R	-	1R	-	-	-	-	1R 4R 5
Sunfishes (<i>Lepomis</i> spp.) ¹	1R 2R	-	-	1R	3R 3R	21R	1R	17R	2R	-	-	-	6R 47R 53
Smallmouth bass	1R 17R	2R 12R	3R	9R 40R	4R 7R	3R 31R	1R 25R	5R 38R	1R 12R	-	1R	7R	29R 195R 224
Largemouth bass	-	-	-	1R	-	-	-	2R	-	-	-	-	2R 2R 4
Yellow perch	1R	-	-	-	-	-	-	-	-	-	-	-	1R 1

¹ General identification.

R Kept.

R Released.

Table 9.2-31

Creeel survey data from the West Dam for each survey day in September 1982.

Weather	8 Wed Overcast			12 Sun Fog, Overcast			25 Sat Fog, Partly Cloudy, Overcast			27 Mon Overcast, Partly Cloudy		
	a	b	c	a	b	c	a	b	c	a	b	c
River Stage (m)	0.97											
Air Temperature (C)	18.0	17.0	18.0	24.1	21.4	24.1	18.5	21.7	20.0	17.5	21.0	20.0
Water Temperature (C)	20.5	20.5	21.0	23.0	20.0	24.1	17.5	19.0	20.3	17.5	18.0	18.3
Times:												
a) morning (0900-1300)	a			a			a			a		
b) afternoon (1300-1700)		b			b			b			b	
c) evening (1700-2100)			c			c			c			c
Total Per Time Period:	TOTAL											
Anglers	-	-	-	1	8	-	-	12	3	-	-	-
Fish Caught	-	-	-	2	10	-	-	27	4	-	-	-
Fish Kept	-	-	-	-	-	-	-	-	-	-	-	-
Hours Fished	-	-	-	0.25	21.50	-	-	31.50	3.00	-	-	-
Catch/Effort (h)	-	-	-	8.00	0.46	-	-	0.86	1.25	-	-	-
Day Totals:												
Anglers	-	-	-	9	8	-	-	15	3	-	-	-
Fish Caught	-	-	-	2	12	-	-	27	4	-	-	-
Fish Kept	-	-	-	-	-	-	-	-	-	-	-	-
Hours Fished	-	-	-	0.25	21.75	-	-	34.50	3.00	-	-	-
Catch/Effort (h)	-	-	-	0.55	0.55	-	-	0.90	1.25	-	-	-
Species	a	b	c	a	b	c	a	b	c	a	b	c
Channel catfish	-	-	-	-	5R	-	-	2R 20K	-	-	-	-
Rock bass	-	-	-	-	2R	-	-	-	-	-	-	-
Smallmouth bass	-	-	-	2R	2R	-	-	2R 3R 3R	-	-	-	-
Walleye	-	-	-	-	-	-	-	-	1R	-	-	-
F kept.												
F Released.												

Table 9.2-32

Creeel survey data from the East Dam for each survey day in September 1982.

Weather	8 Wed Overcast			12 Sun Fog, Overcast			25 Sat Fog, Partly Cloudy, Overcast			27 Mon Overcast, Partly Cloudy		
	a	b	c	a	b	c	a	b	c	a	b	c
River Stage (m)	0.97											
Temperature (C)	16.0	18.0	18.5	24.5	21.0	24.5	18.5	21.0	20.5	17.5	21.0	20.0
Temperature (C)	22.5	22.0	22.0	24.0	28.0	27.0	17.5	18.5	15.5	17.5	18.0	18.5
Times:												
a) morn. (0900-1300)	a			a			a			a		
b) afternoon (1300-1700)		b			b			b			b	
c) evening (1700-2100)			c			c			c			c
Total Per Time Period:	TOTAL											
Anglers	-	-	-	2	5	-	-	1	-	-	2	-
Fish Caught	-	-	-	2	6	-	-	1	-	-	-	-
Fish Kept	-	-	-	-	-	-	-	-	-	-	-	-
Hours Fished	-	-	-	1.00	3.50	-	-	0.25	-	-	3.00	-
Catch/Effort (h)	-	-	-	2.00	1.71	-	-	4.00	-	-	-	-
Day Totals:												
Anglers	-	-	-	2	5	-	-	1	-	-	2	-
Fish Caught	-	-	-	2	6	-	-	1	-	-	-	-
Fish Kept	-	-	-	-	-	-	-	-	-	-	-	-
Hours Fished	-	-	-	4.50	3.50	-	-	0.25	-	-	3.00	-
Catch/Effort (h)	-	-	-	1.78	1.78	-	-	4.00	-	-	-	-
Species	a	b	c	a	b	c	a	b	c	a	b	c
Channel catfish	-	-	-	-	-	-	-	1R	-	-	-	-
Sunfishes (<i>Lepomis</i> spp.) ¹	-	-	-	1R	2R	-	-	-	-	-	-	-
Smallmouth bass	-	-	-	1R	-	-	-	-	-	-	-	-
Largemouth bass	-	-	-	-	1R	-	-	-	-	-	-	-
1 General identification.												
F kept.												
F Released.												

Table 9.2-22

Creel survey data from the YMS for each survey day in September 1982.

Day	8 Wed Overcast			12 Sun Haze, Overcast			21 Sat Partly Cloudy, Overcast			27 Mon Overcast, Partly Cloudy			
River Stage (m)	0.97			0.93			0.96			0.97			
Air Temperature (C)	17.0	18.0	18.0	26.0	29.0	24.3	18.0	21.5	18.0	19.0	23.5	19.0	
Water Temperature (C)	19.5	20.5	20.5	25.0	27.0	24.0	17.5	18.5	18.0	17.5	18.0	18.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	8	11	40	6	9	4	16	6	12	3	14	28	
Fish Caught	11	8	8	-	10	2	74	6	27	-	17	44	127
Fish Kept	4	1	-	-	5	2	15	5	4	-	12	37	86
Hours Fished	12.00	16.34	12.25	3.75	15.75	3.50	48.00	8.92	17.92	3.00	18.00	41.50	200.93
Catch/Effort (h)	0.92	0.49	0.65	-	0.63	0.66	0.50	0.67	1.51	-	0.84	1.06	0.79
Day Totals:													
Anglers	29			19			34			43			
Fish Caught	27			13			57			61			
Fish Kept	5			7			25			49			
Hours Fished	40.59			23.00			74.84			62.50			
Catch/Effort (h)	0.66			0.56			0.76			0.98			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	-	-	3K	-	1K	-	3K	-	2K	-	4K	-	3K 11K 14
Channel catfish	3K	-	-	-	-	-	5K	3K	1K	-	-	5K	11K 6K 17
Rock bass	-	-	-	-	-	-	2K	1K	3K 1K	-	-	-	7K 2K 9
Bluegill	-	-	-	-	-	-	1K	-	-	-	-	-	1K 1
Sunfishes (<i>Lepomis</i> spp.) ¹	2K	-	-	-	4K 2K	-	-	1K	1K	-	2K	4K	11K 5K 16
Smallmouth bass	3K	1K	4K	-	1K 1K	1K	2K 5K	1K	3K	-	2K	3K 1K	9K 19K 28
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	1K	1K - 1
Black crappie	-	-	-	-	-	-	1K	-	-	-	-	-	1K - 1
Crappies (<i>Pomoxis</i> spp.) ¹	-	-	-	-	-	-	1K 1K	-	-	-	4K	25K	30K 1K 31
Yellow perch	-	-	-	-	-	-	-	-	-	-	1K	1K	2K - 2
Walleye	1K 2K	1K 5K	1K	-	-	-	3K 2K	-	1K 15K	-	2K 1K	2K	11K 27K 38

¹ General identification.

K Kept.

R Released.

Table 9.2-24

Creel survey data from the GR for each survey day in October 1982.

Day	9 Sat Partly Cloudy, Clear			14 Thu Clear, Overcast			17 Sun Partly Cloudy Windy, Clear			22 Fri Overcast, Clear			
River Stage (m)	0.95			0.95			0.96			0.96			
Air Temperature (C)	20.5	22.0	22.0	12.5	16.5	17.0	8.5	10.5	11.0	7.5	8.5	10.0	
Water Temperature (C)	20.5	21.5	22.0	14.0	15.0	15.5	11.5	11.5	11.5	11.5	11.5	12.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	22	18	27	8	9	4	2	1	4	-	1	-	96
Fish Caught	69	80	51	21	13	6	1	1	2	-	1	-	243
Fish Kept	17	25	25	12	7	3	-	-	-	-	1	-	60
Hours Fished	33.75	47.25	79.25	12.50	28.00	10.00	5.00	2.00	5.50	-	1.50	-	224.75
Catch/Effort (h)	2.04	1.69	0.64	1.68	0.46	0.60	0.20	0.50	0.36	-	0.67	-	1.09
Day Totals:													
Anglers	67			21			7			1			
Fish Caught	200			40			4			1			
Fish Kept	67			22			-			1			
Hours Fished	180.25			10			12.50			1.50			
Catch/Effort (h)	1.25			0.79			0.32			0.67			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Channel catfish	1K	1K	4K	-	1K 1K	-	-	-	-	-	-	-	7K 14K 21
Rock bass	2K 6K	3K 2K	4K 1K	-	-	-	-	-	-	-	-	-	11K 9K 20
Redbreast sunfish	1K	-	-	-	-	-	-	-	-	-	-	-	1K - 1
Sunfishes (<i>Lepomis</i> spp.) ¹	3K 3K	7K	7K 8K	-	-	-	-	-	-	-	-	-	5K 18K 23
Smallmouth bass	9K 30K 19K 46K	5K 13K 17K 9K	4K 5K	3K 3K	1K	1K	2K	-	-	-	-	-	35K 110K 145
Largemouth bass	1K	-	-	-	-	-	-	-	-	-	-	-	1K - 1
Black crappie	1K	-	-	-	-	-	-	-	-	-	-	-	1K - 1
Crappies (<i>Pomoxis</i> spp.) ¹	-	-	7K 4K	-	-	-	-	-	-	-	-	-	9K 4K 13

¹ General identification.

K Kept.

R Released.

Table 8.2-25

Creel survey data from the West Dam for each survey day in October 1982.

Weather	9 Sat Clear			14 Thu Clear, Overcast Windy			17 Sat Partly Cloudy Windy, Clear			22 Fri Overcast, Clear			TOTAL
	a	b	c	a	b	c	a	b	c	a	b	c	
River Stage (m)	0.95												
Air Temperature (C)	20.0	23.0	20.0	13.0	17.0	17.0	8.0	11.0	11.0	7.5	6.0	6.5	
Water Temperature (C)	20.2	17.5	22.0	15.0	15.0	15.0	10.5	11.0	11.0	11.5	11.0	11.5	
Times:													
a) Morning (0900-1300)	a			a			a			a			
b) Afternoon (1301-1700)		b			b			b			b		
c) Evening (1701-2100)			c			c			c			c	
Total For Time Period:													TOTAL
Anglers	-	3	7	-	2	-	-	-	-	-	-	-	12
Fish Caught	-	34	35	-	10	-	-	-	-	-	-	-	79
Fish Kept	-	3	-	-	-	-	-	-	-	-	-	-	3
Hours Fished	-	4.00	10.99	-	2.00	-	-	-	-	-	-	-	16.99
Catch/Effort (h)	-	3.47	2.18	-	5.00	-	-	-	-	-	-	-	4.16
Day Totals:													
Anglers		10			2								
Fish Caught		69			10								
Fish Kept		3			-								
Hours Fished		16.99			2.00								
Catch/Effort (h)		4.06			5.00								
Species	a	b	c	a	b	c	a	b	c	a	b	c	TOTAL
Channel catfish	-	3K	30K	24K	-	10K	-	-	-	-	-	-	3K 64K 67
Rock bass	-	1K	-	-	-	-	-	-	-	-	-	-	1K 1
Sunfishes (<i>Lepomis</i> spp.) ¹	-	-	7K	-	-	-	-	-	-	-	-	-	7K 7
Smallmouth bass	-	-	3K	-	-	-	-	-	-	-	-	-	3K 3
Walleye	-	-	1K	-	-	-	-	-	-	-	-	-	1K 1

¹ General identification.

K Kept.

R Released.

Table 8.2-26

Creel survey data from the C-4 Dam for each survey day in October 1982.

Weather	9 Sat Clear, Partly Cloudy			14 Thu Clear, Overcast, Partly Cloudy			17 Sun Partly Cloudy Windy, Clear			22 Fri Overcast, Clear			TOTAL
	a	b	c	a	b	c	a	b	c	a	b	c	
River Stage (m)	0.95												
Air Temperature (C)	20.0	22.0	18.5	12.5	16.5	17.0	8.0	13.0	11.5	7.0	6.0	10.0	
Water Temperature (C)	20.5	21.5	21.5	15.0	16.0	16.0	12.5	13.0	13.5	11.5	11.5	12.0	
Times:													
a) Morning (0900-1300)	a			a			a			a			
b) Afternoon (1301-1700)		b			b			b			b		
c) Evening (1701-2100)			c			c			c			c	
Total For Time Period:													TOTAL
Anglers	-	-	-	-	2	1	-	-	-	-	-	-	3
Fish Caught	-	-	-	-	4	1	-	-	-	-	-	-	5
Fish Kept	-	-	-	-	4	-	-	-	-	-	-	-	4
Hours Fished	-	-	-	-	4.00	2.00	-	-	-	-	-	-	6.00
Catch/Effort (h)	-	-	-	-	1.00	0.50	-	-	-	-	-	-	0.83
Day Totals:													
Anglers					3								
Fish Caught					5								
Fish Kept					4								
Hours Fished					6.00								
Catch/Effort (h)					0.83								
Species	a	b	c	a	b	c	a	b	c	a	b	c	TOTAL
Sunfishes (<i>Lepomis</i> spp.) ¹	-	-	-	-	2K	1K	-	-	-	-	-	-	2K 1K 3
Crappies (<i>Pomoxis</i> spp.) ¹	-	-	-	-	2K	-	-	-	-	-	-	-	2K - 2

¹ General identification.

K Kept.

R Released.

Table 9.2-27

Creel survey data from the YRGS for each survey day in October 1982.

Day	7 Sat Clear, Partly Cloudy 0.95			14 Thu Clear, Overcast, Partly Cloudy 0.95			17 Sun Partly Cloudy Windy, Clear 0.95			21 Fri Overcast, Clear 0.95			
River Stage (m)	23.5	23.5	18.0	17.5	18.0	18.0	11.0	12.0	10.5	9.0	8.7	9.0	
Air Temperature (C)	21.5	23.0	20.5	15.0	16.5	15.0	11.5	12.5	11.5	10.5	11.0	11.0	
Water Temperature (C)													
Times:													
a) morning (0900-1300)	a			a			a						
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c				
Total Per Time Period:													TOTAL
Anglers	1	18	10	8	13	10	6	4	20	2	1	6	107
Fish Caught	20	80	1	2	21	13	1	-	8	-	8	5	139
Fish Kept	10	21	-	1	8	12	-	-	3	-	4	-	60
Hours Fished	41.00	35.84	10.50	2.75	29.00	13.00	9.00	3.90	17.75	0.25	0.50	6.50	174.59
Catch/Effort (h)	0.49	1.67	0.10	0.72	0.76	1.00	0.11	-	0.43	-	0.37	0.46	0.80
Day Totals:													
Anglers		27			31			30			9		
Fish Caught		61			37			9			12		
Fish Kept		31			22			3			4		
Hours Fished		67.34			44.75			32.25			10.25		
Catch/Effort (h)		0.91			0.83			0.28			1.77		
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Common carp	3K	-	1K	-	1K	-	-	-	-	-	-	-	3K 2K 5
Channel catfish	1K 1K	8K 2K	-	1K	1K	3K	-	-	-	-	-	-	14K 3K 17
Rock bass	-	3K 3K	-	-	-	1K	-	-	1K	-	-	-	5K 3K 8
Redbreast sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1K - 1
Sunfishes (Lepomis spp.) ¹	1K	2K	-	-	-	-	-	-	-	-	-	-	3K 3
Smallmouth bass	1K 7K	2K 29K	-	-	3K	-	1K	-	-	-	3K 2K	3K	6K 47K 23
Black crappie	5K	8K	-	-	-	-	-	-	-	-	-	-	13K - 13
Walleye	1K	2K	-	1K	7K 8K	9K	-	-	2K 5K	-	1K 3K	-	16K 12K 28

¹ General identification.

K Kept.

R Released.

Table 9.2-28

Creel survey data from the GR for each survey day in November 1982.

Day	3 Wed Fog, Partly Cloudy 0.92		6 Sat Partly Cloudy Windy, Clear Windy 1.01			18 Thu Fog, Partly Cloudy 1.06			21 Sun Fog, Partly Cloudy 1.02				
River Stage (m)													
Air Temperature (C)	18.0	24.0		5.5	8.5		5.0	9.5		11.0	12.0		
Water Temperature (C)	16.0	17.0		11.0	11.0		5.0	5.5		8.0	8.5		
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c				
Total Per Time Period:													TOTAL
Anglers	3	4	NO SURVEY	-	5	NO SURVEY	5	1	NO SURVEY	7	4	NO SURVEY	29
Fish Caught	7	21		-	7		1	4		5	9		54
Fish Kept	7	19		-	2		1	2		4	7		40
Hours Fished	3.50	8.00		-	11.50		4.50	3.00		5.50	10.25		46.25
Catch/Effort (h)	2.00	2.62	NO SURVEY	-	0.61	NO SURVEY	0.22	1.33	NO SURVEY	0.91	0.88	NO SURVEY	1.17
Day Totals:													
Anglers		7			5			6			11		
Fish Caught		28			7			5			14		
Fish Kept		26			2			3			9		
Hours Fished		11.50			11.50			7.50			15.75		
Catch/Effort (h)		2.43			0.61			0.67			0.89		
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Rock bass	2K	-		-	-		-	-		-	-		2K - 2
Sunfishes (Lepomis spp.) ¹	1K	11K		-	-		-	-		3K	-		12K 3K 15
Smallmouth bass	-	2K	NO SURVEY	-	2K 5K	NO SURVEY	1K	2K 2K	NO SURVEY	2K	7K 2K	NO SURVEY	14K 11K 25
Crappies (Pomoxis spp.) ²	4K	8K	NO SURVEY	-	-		-	-		-	-		12K - 12

¹ General identification.² Survey not conducted due to darkness.

K Kept.

R Released.

Table 9.2-39

Creek survey data from the West Dam for each survey day in November 1982.

Day	3 Wed		4 Sat		18 Thu		21 Sun		
Weather	Fog, Partly Cloudy		Partly Cloudy Windy, Clear Windy		Fog, Overcast		Fog, Partly Cloudy		
River Stage (ft)	0.92		1.01		1.06		1.07		
Air Temperature (C)	17.0	23.5	8.0	7.0	7.0	6.5	11.0	14.0	
Water Temperature (C)	16.0	16.5	8.0	8.0	6.0	6.0	8.0	9.5	
Times:									
a) morning (0900-1300)	a		a		a		a		
b) afternoon (1301-1700)		b		b		b		b	
c) evening (1701-2100)									
Total Per Time Period:									TOTAL
Anglers	-	-	NO SURVEY	-	NO SURVEY	-	-	-	-
Fish Caught	x	-	-	x	-	-	-	-	-
Fish Kept	x	-	-	x	-	-	-	-	-
Hours Fished	-	-	NO SURVEY	-	NO SURVEY	-	-	-	-
Catch/Effort (h)	-	-	NO SURVEY	-	NO SURVEY	-	-	-	-
Day Totals:									
Anglers	-	-	-	-	-	-	-	-	-
Fish Caught	x	-	-	x	-	-	-	-	-
Fish Kept	x	-	-	x	-	-	-	-	-
Hours Fished	-	-	-	-	-	-	-	-	-
Catch/Effort (h)	-	-	-	-	-	-	-	-	-
Species	a	b	c	a	b	c	a	b	c
1 Survey not conducted due to darkness.									

Table 9.2-40

Creek survey data from the East Dam for each survey day in November 1982.

Day	3 Wed		4 Sat		18 Thu		21 Sun			
Weather	Fog, Partly Cloudy		Partly Cloudy, Clear		Overcast, Partly Cloudy		Fog, Partly Cloudy			
River Stage (ft)	0.92		1.01		1.06		1.07			
Air Temperature (C)	16.5	23.5	5.5	8.0	5.0	12.1	11.0	15.0		
Water Temperature (C)	16.0	16.0	7.5	10.7	6.0	7.0	8.0	8.5		
Times:										
a) morning (0900-1300)	a		a		a		a			
b) afternoon (1301-1700)		b		b		b		b		
c) evening (1701-2100)										
Total Per Time Period:									TOTAL	
Anglers	-	-	NO SURVEY	-	NO SURVEY	-	-	-	-	
Fish Caught	-	-	-	2	-	-	-	-	2	
Fish Kept	-	-	-	2	-	-	-	-	2	
Hours Fished	-	-	-	2.00	-	-	-	-	2.00	
Catch/Effort (h)	-	-	-	1.00	-	-	-	-	1.00	
Day Totals:										
Anglers	-	-	-	-	-	-	-	-	-	
Fish Caught	-	-	-	2	-	-	-	-	2	
Fish Kept	-	-	-	2	-	-	-	-	2	
Hours Fished	-	-	-	2.00	-	-	-	-	2.00	
Catch/Effort (h)	-	-	-	1.00	-	-	-	-	1.00	
Species	a	b	c	a	b	c	a	b	c	
sunfishes (<i>Lepomis</i> spp.) ¹	-	-	NO SURVEY	2E	NO SURVEY	-	E,S	-	NO SURVEY	2E
1 General identification.										
2 Survey not conducted due to darkness.										
E Released.										

Table 9.2-a

Creel survey data from the YHUS for each survey day in November 1982.

Day	3 Wed Fog, Partly Cloudy 0.83			6 Sat Clear, Partly Cloudy 1.01			18 Thu Overcast, Partly Cloudy 1.06			21 Sun Fog, Overcast, Partly Cloudy 1.02			
River Stage (m)													
Air Temperature (C)	19.0	23.3	21.5	9.3	8.5	9.3	8.3	10.5	11.5	10.5	14.5	14.0	
Water Temperature (C)	16.0	16.0	16.0	10.0	10.5	10.5	8.5	8.5	8.5	8.0	9.5	9.5	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	-	10	5	4	4	5	4	4	7	3	8	12	70
Fish Caught	-	45	30	4	7	1	1	-	-	5	2	18	94
Fish Kept	-	28	7	1	5	-	1	-	-	3	1	9	55
Hours Fished	-	14.50	4.75	1.75	2.67	5.09	5.50	9.50	9.00	3.90	7.50	25.5	89.24
Catch/Effort (h)	-	3.10	2.10	2.29	2.62	0.20	0.18	-	-	1.43	0.40	0.70	1.05
Day Totals:													
Anglers	15			15			17			23			
Fish Caught	55			12			1			26			
Fish Kept	35			6			1			13			
Hours Fished	19.25			9.51			24.00			36.50			
Catch/Effort (h)	2.86			1.26			0.04			0.71			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Rock bass	-	8K	4K	-	5K 1K	-	-	-	-	-	-	-	17K 1K 1K
Sunfishes (Lepomis spp.) ¹	-	3K	-	-	-	-	-	-	-	-	-	-	3K 5
Smallmouth bass	-	20K 10R	3K 2R	1K 2R	1R	-	-	-	-	-	-	1K	25K 15R 40
Crayfish (Pacifika spp.) ¹	-	-	1K	-	-	-	-	-	-	-	-	-	1K 1
Walleye	-	2K	-	1K	-	1R	1K	-	-	3K 2R	1K 2R	8K 9R	12K 17R 30

¹ General identification.

K Kept.

R Released.

Table 9.2-c

Creel survey data from the GR for each survey day in December 1982.

Day	4 Sat Overcast, Clear 1.36			8 Mon Partly Cloudy, Overcast 1.29			19 Sun Overcast 1.97			21 Tue Partly Cloudy Windy 1.36			
River Stage (m)													
Air Temperature (C)	17.0	21.5		16.5	15.5		0.5	1.0		4.0	3.5		
Water Temperature (C)	9.0	9.5		11.5	12.0		1.0	1.0		1.5	1.5		
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)	b			b			b			b			
c) evening (1701-2100)	c			c			c			c			
Total Per Time Period:													TOTAL
Anglers	3	10	NO SURVEY	4	3	NO SURVEY	-	-	NO SURVEY	-	-	NO SURVEY	20
Fish Caught	2	2	NO SURVEY	1	-	NO SURVEY	-	-	NO SURVEY	-	-	NO SURVEY	5
Fish Kept	-	-	NO SURVEY	1	-	NO SURVEY	-	-	NO SURVEY	-	-	NO SURVEY	1
Hours Fished	6.00	14.50	NO SURVEY	1.50	3.00	NO SURVEY	-	-	NO SURVEY	-	-	NO SURVEY	25.00
Catch/Effort (h)	0.33	0.14	NO SURVEY	0.66	-	NO SURVEY	-	-	NO SURVEY	-	-	NO SURVEY	0.20
Day Totals:													
Anglers	13			7			-			-			
Fish Caught	4			1			-			-			
Fish Kept	-			1			-			-			
Hours Fished	20.50			4.50			-			-			
Catch/Effort (h)	0.20			0.22			-			-			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Channel catfish	-	-	NO SURVEY	1K	-	NO SURVEY	-	-	NO SURVEY	-	-	NO SURVEY	1K 1
Smallmouth bass	2R	2K	SURVEY	-	-	SURVEY	-	-	SURVEY	-	-	SURVEY	- 4R 4

¹ Survey not conducted due to darkness.

K Kept.

R Released.

Table 9.2-3

Creef survey data from the West Dam for each survey day in December 1982.

Day	4 Sat Partly Cloudy, Clear		6 Mon Partly Cloudy, Overcast		14 Sun Overcast		21 Tue Partly Cloudy Windy		
River Stage (ft)	1.34		1.29		1.37		1.36		
Air Temperature (C)	16.5	20.0	16.5	15.5	1.0	1.0	1.0	3.5	
Water Temperature (C)	9.0	11.0	12.0	12.5	1.0	1.5	2.0	1.5	
Times:									
a) morning (0900-1300)	a		a		a		a		
b) afternoon (1301-1700)		b		b		b		b	
c) evening (1701-2100)									c
Total Per Time Period:									TOTAL
Anglers	-	4	-	3	-	-	-	-	10
Fish Caught	-	3	-	3	-	-	-	-	3
Fish Kept	-	-	-	-	-	-	-	-	-
Hours Fished	-	4.00	-	3.00	-	-	-	-	1.00
Catch/Effort (h)	-	3.00	-	3.00	-	-	-	-	1.00
Day Totals:									
Anglers	-	4	-	3	-	-	-	-	
Fish Caught	-	3	-	3	-	-	-	-	
Fish Kept	-	-	-	-	-	-	-	-	
Hours Fished	-	4.00	-	3.00	-	-	-	-	
Catch/Effort (h)	-	3.00	-	3.00	-	-	-	-	
Species	a	b	c	a	b	c	a	b	Total
Channel catfish	-	3R	-	-	-	-	-	-	3R

a) Survey not conducted due to darkness.
 b) Released.

Table 9.2-3a

Creef survey data from the East Dam for each survey day in December 1982.

Day	4 Sat Overcast, Clear		6 Mon Partly Cloudy, Overcast		14 Sun Overcast		21 Tue Partly Cloudy Windy		
River Stage (ft)	1.34		1.29		1.37		1.36		
Air Temperature (C)	14.0	20.0	17.0	16.0	0.5	0.0	4.0	3.5	
Water Temperature (C)	9.5	11.5	12.5	12.5	1.5	1.5	2.0	1.5	
Times:									
a) morning (0900-1300)	a		a		a		a		
b) afternoon (1301-1700)		b		b		b		b	
c) evening (1701-2100)									c
Total Per Time Period:									TOTAL
Anglers	2	1	-	-	-	-	1	-	4
Fish Caught	-	2	-	-	-	-	-	-	2
Fish Kept	-	-	-	-	-	-	-	-	-
Hours Fished	3.00	1.00	-	-	-	-	1.00	-	6.00
Catch/Effort (h)	-	1.00	-	-	-	-	1.00	-	0.32
Day Totals:									
Anglers	-	3	-	-	-	-	1	-	
Fish Caught	-	2	-	-	-	-	-	-	
Fish Kept	-	-	-	-	-	-	-	-	
Hours Fished	-	5.00	-	-	-	-	1.00	-	
Catch/Effort (h)	-	0.40	-	-	-	-	-	-	
Species	a	b	c	a	b	c	a	b	Total
Smallmouth bass	-	2R	-	-	-	-	-	-	2R

a) Survey not conducted due to darkness.
 b) Released.

Table 9.2-45

Creel survey data from the YHGS for each survey day in December 1982.

Day	4 Sat			5 Sun			19 Sun			21 Tue			
Weather	Partly Cloudy, Clear, Overcast			Partly Cloudy, Overcast, Partly Cloudy			Overcast, Snow			Partly Cloudy Windy			
River Stage (m)	1.36			1.29			1.27			1.36			
Air Temperature (C)	20.5	24.0	18.5	17.5	16.0	14.5	1.0	2.0	0.5	5.5	7.5	2.5	
Water Temperature (C)	10.5	12.0	11.5	12.0	12.5	12.5	1.5	1.5	1.0	2.5	2.0	2.0	
Times:	a) morning (0900-1300)			b) afternoon (1301-1700)			c) evening (1701-2100)						
Total Per Time Period:	a	b	c	a	b	c	a	b	c	a	b	c	TOTAL
Anglers	2	5	6	-	6	2	-	-	2	2	-	1	26
Fish Caught	-	4	10	-	3	-	-	-	-	1	-	-	18
Fish Kept	-	-	-	-	3	-	-	-	-	-	-	-	3
Hours Fished	1.00	2.16	9.25	-	4.25	3.00	-	-	-	1	-	-	4
Catch/Effort (h)	-	1.85	1.08	-	0.70	-	-	-	2.00	5.00	-	-	26.66
Day Totals:													
Anglers	13			8			2			3			
Fish Caught	14			3			-			1			
Fish Kept	-			3			-			-			
Hours Fished	12.61			7.25			2.00			5.00			
Catch/Effort (h)	1.13			0.41			-			-			
Species	a	b	c	a	b	c	a	b	c	a	b	c	Total
Channel catfish	-	-	-	-	-	-	-	-	-	-	-	-	-
Rock bass	-	3R	5R	-	-	-	-	-	-	1R	-	-	1R
Sunfishes (<i>Lepomis</i> spp.) ¹	-	1R	-	-	-	-	-	-	-	-	-	-	1R
Smallmouth bass	-	-	-	-	-	-	-	-	-	-	-	-	-
Black crappie	-	-	2R	-	-	-	-	-	-	-	-	-	2R
Yellow perch	-	-	-	3R	-	-	-	-	-	-	-	-	3R
Walleye	-	-	1R	-	-	-	-	-	-	-	-	-	1R
1 General identification.													
R Kept.													
R Released.													

Table 9.2-46

Monthly summary of anglers, fish caught, fish kept, hours fished, catch/effort, and harvest/effort from interviews at each creel survey area in 1982.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	R TOTAL
Anglers														
GR	-	*	2	24	310	88	190	166	128	96	29	20	1053	36.7
West Dan	-	*	-	8	74	17	38	17	24	12	-	10	200	7.0
East Dan	-	*	6	38	133	144	60	9	10	9	4	4	411	14.3
YHGS	9	13	25	66	278	148	166	167	127	107	70	26	1202	42.0
Total	9	13	33	136	795	397	454	359	289	218	103	60	2866	
Fish Caught														
GR	-	*	-	61	511	189	310	569	336	245	54	5	2280	34.7
West Dan	-	*	-	139	724	26	166	13	43	79	-	3	1193	18.2
East Dan	-	*	-	61	448	617	131	20	9	5	2	2	1295	19.7
YHGS	-	4	38	83	362	167	257	281	158	139	94	18	1801	27.4
Total	-	4	38	344	2245	999	864	883	546	468	150	28	6569	
Fish Kept														
GR	-	*	-	13	146	32	53	42	53	90	40	1	470	25.9
West Dan	-	*	-	13	134	5	6	-	4	3	-	-	167	9.2
East Dan	-	*	-	37	193	148	19	17	-	4	-	-	418	23.0
YHGS	-	-	2	32	263	75	83	100	86	60	55	4	760	41.9
Total	-	-	2	95	736	260	163	159	143	157	95	5	1815	
Hours Fished														
GR	-	*	0.50	34.83	528.05	141.69	286.31	375.37	246.12	224.75	46.25	25.00	1908.87	39.0
West Dan	-	*	-	14.33	180.16	24.50	65.00	77.00	56.25	18.99	-	1.00	397.23	8.1
East Dan	-	*	-	1.15	32.00	199.06	219.27	82.17	19.00	7.75	6.00	2.00	574.40	11.7
YHGS	4.15	16.85	36.30	85.40	534.73	203.37	303.33	335.60	200.93	174.59	89.26	26.66	2013.37	41.2
Total	4.15	16.85	37.95	166.56	1442.00	589.03	738.81	766.97	511.05	424.32	137.51	58.66	4893.87	
Catch/Effort (h)														
GR	-	*	-	1.75	0.97	1.33	1.08	1.32	1.36	1.09	1.17	0.20	1.16	
West Dan	-	*	-	9.70	4.02	1.06	2.55	0.35	0.76	4.16	-	3.00	3.00	
East Dan	-	*	-	1.91	2.25	2.81	1.59	1.05	1.18	0.83	1.00	0.33	2.25	
YHGS	-	0.24	1.05	0.97	1.05	0.82	0.84	0.83	0.79	0.80	1.05	0.68	0.89	
Monthly Mean	-	0.24	1.00	2.06	1.56	1.70	1.17	1.15	1.07	1.10	1.09	0.68	1.34	
Harvest/Effort (h)														
GR	-	*	-	0.37	0.28	0.23	0.18	0.11	0.22	0.40	0.86	0.04	0.25	
West Dan	-	*	-	0.91	0.74	0.20	0.12	-	0.07	0.16	-	-	0.42	
East Dan	-	*	-	1.16	0.97	3.67	0.23	0.89	-	0.67	-	-	0.73	
YHGS	-	-	0.06	0.37	0.49	0.37	0.27	0.30	0.43	0.34	0.62	0.15	0.38	
Monthly Mean	-	-	0.05	0.57	0.51	0.44	0.22	0.21	0.28	0.37	0.69	0.08	0.37	

* Surveys not conducted due to ice.

Table 9.2-47

Monthly summary of anglers, fish caught, fish kept, hours fished, and catch/effort for weekdays and weekend days from the UK, 1982.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Anglers													
Weekdays	-	*	2	24	61	37	57	44	24	22	13	7	291
Weekend days	-	*	-	-	249	51	133	122	104	74	14	13	741
Fish Caught													
Weekdays	-	*	-	61	132	309	101	101	80	41	33	1	639
Weekend days	-	*	-	-	379	80	209	468	276	206	21	-	1661
Fish Kept													
Weekdays	-	*	-	13	51	25	10	16	4	23	24	1	178
Weekend days	-	*	-	-	94	7	43	28	64	43	11	-	297
Hours Fished													
Weekdays	-	*	0.50	36.83	112.74	89.19	72.84	93.59	37.77	32.00	19.00	4.30	516.96
Weekend days	-	*	-	-	413.31	52.50	213.47	281.79	208.35	172.73	27.25	20.50	1291.91
Catch/Effort (lb)													
Weekdays	-	*	-	1.75	1.17	1.21	1.39	1.08	1.59	0.79	1.74	0.22	1.24
Weekend days	-	*	-	-	0.91	1.52	0.95	1.65	1.32	1.18	0.27	0.20	1.18

* Surveys not conducted due to ice.

Table 9.2-48

Monthly summary of anglers, fish caught, fish kept, hours fished, and catch/effort for weekdays and weekend days from the West Dan, 1982.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Anglers													
Weekdays	-	*	-	8	24	8	10	-	-	2	-	4	56
Weekend days	-	*	-	-	50	9	28	17	24	10	-	6	144
Fish Caught													
Weekdays	-	*	-	139	227	12	24	-	-	10	-	-	412
Weekend days	-	*	-	-	497	14	142	13	43	69	-	3	781
Fish Kept													
Weekdays	-	*	-	13	41	1	3	-	-	-	-	-	58
Weekend days	-	*	-	-	83	4	5	-	-	3	-	-	109
Hours Fished													
Weekdays	-	*	-	14.33	31.75	12.00	15.25	-	-	1.00	-	-	95.33
Weekend days	-	*	-	-	128.41	12.50	46.75	37.00	58.25	16.99	-	1.00	301.90
Catch/Effort (lb)													
Weekdays	-	*	-	4.70	4.39	1.00	1.57	-	-	5.00	-	-	4.33
Weekend days	-	*	-	-	3.87	1.12	2.85	0.35	0.76	4.06	-	3.00	2.59

* Surveys not conducted due to ice.

Table 9.2-49

Monthly summary of anglers, fish caught, fish kept, hours fished, and catch/effort for weekdays and weekend days from the East Dan, 1982.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Anglers													
Weekdays	-	*	6	38	31	84	31	4	2	3	-	1	200
Weekend days	-	*	-	-	102	60	29	5	8	-	4	3	211
Fish Caught													
Weekdays	-	*	-	61	152	456	91	1	-	5	-	-	766
Weekend days	-	*	-	-	296	161	40	19	9	-	2	2	529
Fish Kept													
Weekdays	-	*	-	37	97	131	15	-	-	4	-	-	284
Weekend days	-	*	-	-	96	17	4	17	-	-	-	-	134
Hours Fished													
Weekdays	-	*	1.15	32.00	47.48	123.84	41.67	8.00	3.00	1.00	-	1.00	264.14
Weekend days	-	*	-	-	151.58	95.43	40.50	11.00	4.75	-	2.00	5.00	310.26
Catch/Effort (lb)													
Weekdays	-	*	-	1.91	3.20	3.68	2.18	0.12	-	0.83	-	-	2.90
Weekend days	-	*	-	-	1.85	1.65	0.99	1.73	1.89	-	1.00	0.40	1.70

* Surveys not conducted due to ice.

Table 9.2-50

Monthly summary of anglers, fish caught, fish kept, hours fished, and catch/effort for weekdays and weekend days from the YRGS, 1982.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Anglers													
Weekdays	-	2	22	35	100	74	75	69	74	40	32	11	534
Weekend days	9	11	3	31	158	74	91	98	53	67	38	13	668
Fish Caught													
Weekdays	-	2	38	58	215	82	153	59	88	49	56	4	804
Weekend days	-	2	-	25	347	85	104	222	70	90	38	14	947
Fish Kept													
Weekdays	-	-	2	20	97	40	51	44	54	26	36	4	374
Weekend days	-	-	-	12	166	35	32	56	32	34	19	-	386
Hours Fished													
Weekdays	-	4.50	27.95	44.32	202.16	85.32	148.41	127.10	103.09	35.00	43.25	12.25	833.35
Weekend days	4.15	12.35	8.35	41.08	332.57	118.25	156.92	208.50	97.84	119.59	46.01	14.41	1160.02
Catch/Effort (lb)													
Weekdays	-	0.44	1.36	1.31	1.06	0.96	1.03	0.46	0.85	0.89	1.24	0.33	0.94
Weekend days	-	0.19	-	0.61	1.04	0.72	0.66	1.06	0.72	0.75	0.82	0.97	0.86

Table 9.2-51

Comparison of anglers, fish caught, fish kept, hours fished, catch/effort (c/e), and harvest/effort (h/e) between creel survey zones in the General Reservoir, 1982.

Zone*	Anglers	Fish Caught	Fish Kept	Hours Fished	c/e	h/e
(1) West channel, west shore	239	436	116	382.97	1.14	0.30
(2) West channel, east shore	33	40	14	48.75	0.82	0.29
(3) West - center channel confluence	179	413	93	341.73	1.24	0.27
(4) South center channel, west shore	25	32	6	43.99	0.73	0.14
(5) South center channel, east shore	22	16	2	17.83	0.56	0.11
(6) North center channel, west shore	9	2	1	6.17	0.32	0.16
(7) North center channel, east shore	15	69	6	38.98	1.77	0.15
(8) East channel, west shore	7	8	1	23.50	0.34	0.04
(9) East channel, east shore	147	133	39	161.54	0.82	0.26
(10) East of Fall Island, northeast shore	39	110	13	81.56	1.35	0.16
(11) West of Fall Island, east of Hill Island	193	476	92	401.18	1.19	0.23
(12) West of Hill Island, northwest shore	43	16	6	44.1	0.41	0.14

* See Figure 9.1-2 for location of zones.

Table 9.2-52

Monthly comparison of fish caught, fish kept, hours fished, catch/effort, and harvest/effort by boat and shore anglers in the General Reservoir, 1982.

		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL (X)	% TOTAL
ANGLERS	Boat	-	8	159	50	133	134	107	62	17	15	685	65.05
	Shore	2	16	151	38	57	32	21	34	12	5	368	34.95
FISH CAUGHT	Boat	-	43	353	138	246	544	319	200	35	4	1882	82.54
	Shore	-	18	158	51	64	25	17	45	19	1	398	17.46
FISH KEPT	Boat	-	5	112	18	32	41	46	72	26	0	352	74.89
	Shore	-	8	34	14	21	1	7	18	14	1	118	25.11
HOURS FISHED	Boat	-	17.25	335.83	86.18	223.16	326.36	229.28	159.00	36.00	20.50	1433.56	75.10
	Shore	0.50	17.58	192.22	55.51	63.15	49.01	16.84	65.75	10.25	4.50	475.31	24.90
CATCH/EFFORT (h)	Boat	-	2.49	1.05	1.60	1.10	1.67	1.39	1.26	0.97	0.20	(1.17)	
	Shore	-	1.72	0.82	0.92	1.01	0.51	1.01	0.68	1.85	0.22	(0.80)	
HARVEST/EFFORT (h)	Boat	-	0.29	0.33	0.21	0.14	0.12	0.20	0.45	0.72	0.00	(0.25)	
	Shore	-	0.46	0.18	0.25	0.33	0.02	0.42	0.27	1.36	0.22	(0.35)	

Table 9. 2-55

Monthly summary of fishes caught by anglers in the Sanquharum River near 78180, January through December 1982. Numbers in parentheses denote fish kept.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL	% TOTAL
Glazed shad	-	-	-	2	2	2(1)	-	-	-	-	-	-	4	0.1
Bullhead trout	-	-	-	-	-	2(1)	-	-	-	-	-	-	2(1)	+0.1
Brown trout	-	-	-	-	-	1(1)	-	-	-	-	-	-	1(1)	+0.1
Fallunio trout	-	-	-	-	1(1)	-	-	-	-	-	-	-	1(1)	+0.1
Mudminnow	-	-	-	-	27(15)	23(6)	19(8)	19(8)	15(3)	5(3)	-	-	111(64)	1.7(2.4)
Common carp	-	-	5	7(2)	-	1(1)	-	-	-	-	-	-	1(1)	+0.1
Creek chub	-	-	-	2	-	-	-	1	-	-	-	-	3	+
Fallfish	-	-	-	-	4(4)	1(1)	-	2(2)	-	-	-	-	7(7)	0.1(0.4)
Quillback	-	-	-	3	2(2)	-	-	-	-	-	-	-	3(2)	+0.1
White sucker	-	-	-	1(1)	1(1)	-	-	-	-	-	-	-	2(2)	+0.1
Northern hog sucker	-	-	-	2(1)	48(37)	-	-	-	-	-	-	-	48(38)	0.7(2.3)
Shorthead redhorse	-	-	-	2	2	3	-	-	-	-	-	-	7	+
Suckers (Catostomidae)*	-	-	-	2(2)	1(1)	1	-	-	-	-	-	-	4(3)	0.1(0.2)
Yellow perch	-	-	-	3(3)	-	1(1)	2(1)	-	-	-	-	-	5(5)	0.1(0.3)
Brown bullhead	-	-	-	-	1	-	-	-	-	-	-	-	1	+
Yellow bullhead/brown bullheads*	-	-	-	3(1)	189(11)	99(37)	129(31)	185(53)	65(21)	105(24)	-	5(2)	778(290)	11.8(15.4)
Channel catfish	-	-	-	3	-	-	-	-	-	-	-	-	3	+
Bullhead catfishes (Ictaluridae)*	-	-	-	37(18)	363(182)	81(49)	78(26)	105(21)	60(16)	29(16)	20(18)	8	757(365)	11.5(15.8)
Rock bass	-	-	-	3(3)	31(31)	12(12)	2(2)	5(5)	-	2(2)	-	-	55(56)	0.8(3.0)
Redbreast sunfish	-	-	-	2(2)	10(10)	6(5)	-	-	-	-	-	-	18(18)	0.3(1.0)
Green sunfish	-	-	-	13(13)	35(35)	29(27)	2(2)	3(3)	-	-	-	-	82(80)	1.2(3.5)
Pumpkinseed	-	-	-	5(5)	19(17)	37(31)	3(2)	8(8)	6(1)	-	-	-	78(66)	1.2(3.5)
Bluegill	-	-	-	6	68(3)	119	53(15)	67(8)	75(17)	36(7)	27(12)	1	427(62)	6.5(3.6)
Sunfishes (Lepomis spp.)*	-	-	-	191(43)	997(203)	276(26)	660(46)	479(25)	265(40)	221(61)	65(39)	8	2960(491)	46.8(27.0)
Smallmouth bass	-	-	-	3	9(3)	6(2)	1(1)	1(1)	6(3)	1(1)	-	-	27(31)	0.4(0.6)
Largemouth bass	-	-	-	-	23(22)	18(16)	-	5(5)	-	-	-	-	46(43)	0.7(2.6)
White crappie	-	-	-	-	21(21)	5(2)	2(2)	6(5)	1(1)	16(16)	-	3(3)	49(48)	0.7(2.6)
Black crappie	-	-	-	-	21(7)	16(8)	7	6(6)	31(30)	15(13)	13(12)	-	109(72)	1.7(6.0)
Crayfish (Decapoda spp.)*	-	-	-	-	21(6)	3(1)	1(1)	2(1)	3(2)	-	-	-	34(33)	0.5(0.7)
Yellow perch	-	-	1(1)	2(1)	351(23)	266(34)	127(26)	203(3)	39(11)	40(18)	30(12)	2	967(159)	16.2(17.1)
Shiners	-	4	32(1)	56	344(95)	256(73)	893(163)	893(139)	546(143)	668(157)	150(92)	28(5)	4597(1815)	70.0
TOTAL	-	4	38(1)	344(95)	256(73)	997(260)	896(163)	893(139)	546(143)	668(157)	150(92)	28(5)	4597(1815)	70.0

* General identification.

+ Less than 0.05%.

Table 9.2-54
 Numbers and percent of total fishes caught and kept from each creel survey area near PINE, January through December, 1987.

	CR		West Dam		East Dam		West Dam		East Dam		TOTAL	
	Caught No.	% Kept	Caught No.	% Kept	Caught No.	% Kept	Caught No.	% Kept	Caught No.	% Kept	Caught No.	% Kept
Glizard whed	-	-	1	25.0	-	-	1	25.0	-	-	1	25.0
Bainbow trout	-	-	-	-	-	-	-	-	-	-	-	-
Brown trout	-	-	-	-	-	-	-	-	-	-	-	-
Falcons trout	-	-	-	-	-	-	-	-	-	-	-	-
Suskelunge	1	33.3	-	-	-	-	-	-	-	-	-	-
Common carp	10	9.0	2	3.6	1	2.3	1	100.0	96	86.7	111	64
Creek chub	-	-	-	-	-	-	-	-	-	-	-	-
Fallfish	3	100.0	-	-	-	-	-	-	-	-	-	-
Quillback	-	-	1	14.3	1	14.3	-	-	5	71.4	7	7
White sucker	-	-	1	33.3	-	-	-	-	2	66.7	3	2
Northern hog sucker	-	-	1	50.0	1	50.0	-	-	-	-	2	2
Shorthead redhorse	-	-	24	50.0	19	50.0	-	-	24	50.0	48	38
Suckers (Cottosomidae)*	-	-	1	33.3	-	-	2	66.7	-	-	3	3
Yellow hollhead	-	-	-	-	-	-	-	-	-	-	-	-
Brown hollhead	2	40.0	-	-	-	-	-	-	3	60.0	5	5
Yellow hollhead/brown hollhead	1	100.0	-	-	-	-	-	-	-	-	-	-
Channel catfish	209	26.9	72	27.7	19	6.8	59	7.8	111	3.9	201	28.0
hollhead catfishes (Ictaluridae)*	-	-	-	-	-	-	-	-	-	-	-	-
Rock bass	326	43.1	88	23.5	13	3.8	163	21.5	100	29.0	202	28.2
Redbreast sunfish	16	29.1	15	27.8	-	-	25	45.5	25	46.3	50	56
Green sunfish	1	5.6	1	5.6	-	-	17	94.4	17	94.4	18	18
Pumpkinseed	16	19.5	15	19.8	-	-	59	72.0	58	72.5	74	80
Bluegill	12	15.4	5	7.8	-	-	56	71.8	50	78.1	61	66
Sunfishes (Lepomis spp.)*	211	49.4	34	38.1	2	3.2	128	30.0	75	15.3	216	29.7
Smallmouth bass	1393	47.4	187	38.1	85	17.3	401	33.6	25	15.3	618	29.3
Largemouth bass	18	66.7	5	45.6	1	9.1	5	18.5	2	18.2	3	27.3
White crappie	4	8.7	4	9.3	-	-	15	32.6	13	30.2	27	58.7
Black crappie	11	22.4	11	22.9	-	-	10	20.4	40	20.8	28	57.3
Crappies (Ictalurus spp.)	60	36.7	26	36.1	1	1.4	15	13.8	10	13.9	46	48.6
Yellow perch	3	8.8	1	7.7	-	-	1	2.9	1	7.7	2	13
Mudpate	3	0.3	-	-	26	20.2	323	33.5	35	27.1	310	31.3
TOTAL	2780	36.7	470	25.9	167	9.2	1295	19.7	418	23.0	1801	27.5
												6507
												1352

* General Identification.

Table 9.2-53

Percent composition of fishes caught and kept from each creel survey area near TMINS, January through December 1982.

	CR		West End		East End		Total	
	Caught	Kept	Caught	Kept	Caught	Kept	Caught	Kept
Cizzard shad	+	+	0.1	+	0.1	+	0.1	+
Rainbow trout	+	+	+	+	0.2	0.2	+	+
Brown trout	+	+	+	+	0.1	0.2	+	+
Valentino trout	+	+	+	+	0.1	0.2	+	+
Muskellunge	+	+	+	+	0.1	+	0.1	+
Common carp	0.4	0.4	0.3	0.6	0.2	+	5.2	5.4
Creek shad	+	+	+	+	0.1	0.2	+	+
Fallfish	0.1	+	+	+	+	+	+	+
Quillback	+	+	0.1	0.4	0.1	0.2	0.3	0.6
White sucker	+	+	0.1	+	+	+	0.1	0.3
Northern hog sucker	+	+	0.1	0.6	0.1	0.2	+	+
Shorthead redhorse	+	+	2.0	11.4	+	+	1.3	2.3
Suckers (Catostomidae)*	+	+	0.1	+	0.2	+	+	+
Yellow bullhead	+	+	+	+	0.3	0.2	+	+
Brown bullhead	0.1	0.4	+	+	+	+	0.2	0.4
Yellow bullhead/Brown bullhead*	+	+	+	+	+	+	+	+
Flathead catfish	9.2	15.3	17.5	11.4	4.8	2.8	16.7	23.4
Flathead catfishes (Ictaluridae)*	+	+	+	+	+	+	0.2	+
Rock bass	14.3	18.7	3.3	7.8	12.6	13.9	11.2	18.9
Redbreast sunfish	0.7	3.2	+	+	1.9	4.0	0.8	+
Green sunfish	+	0.2	+	+	1.3	4.1	+	+
Pumpkinseed	0.7	3.2	+	+	4.6	13.9	0.4	0.9
Bluegill	0.5	1.1	+	+	4.3	12.0	0.4	1.2
Sunfishes (Lepomis spp.)*	9.2	7.6	1.2	+	8.9	0.5	7.0	3.2
Smallmouth bass	61.1	39.8	46.2	50.9	31.0	17.9	34.3	18.9
Largemouth bass	0.8	1.1	0.1	0.6	0.4	0.5	0.2	0.4
White crappie	0.2	0.8	+	+	1.2	3.1	1.5	3.4
Black crappie	0.3	2.3	+	+	0.8	2.4	1.4	3.6
Crappies (Pomoxis spp.)*	1.8	3.3	0.8	0.6	1.2	2.4	2.4	4.6
Yellow perch	0.1	0.2	+	+	0.1	0.2	1.7	1.4
Walleye	0.1	+	27.7	15.6	28.9	8.8	17.2	8.9

* General identification.

+ Less than 0.05%.

9.2-56

Use of catch by anglers interviewed near TMINS in 1982. Numbers in parentheses denote anglers who reported that they ate their catch prior to the 1979 TMINS accident, but did otherwise in 1982.

Use of Catch	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL ANGLERS
Eat	4	-	11	39	324	217	91	81	36	47	42	10	902
Release	1	3(1)	9(3)	32(5)	147(18)	59(8)	91(15)	82(21)	72(23)	13(3)	5	18(4)	532(100)
Give Away	-	1	2(1)	4	18(3)	5	1	2	-	3	-	1	37(4)
Other	-	-	-	1	2	-	-	-	-	-	-	-	3
Eat-Release	3	8	9	31	166	49	210	168	145	128	37	28	982
Eat-Give Away	-	-	-	3	14	5	2	-	4	2	2	1	33
Eat-Other	-	-	-	-	-	2	-	-	-	-	-	-	2
Release-Give Away	-	-	1	5(1)	17(4)	2	16(3)	3(1)	7	4	3	1	59(9)
Release-Other	-	-	-	-	2	-	-	-	-	-	-	-	2
Eat-Release-Give Away	-	-	1	4	4	6	7	2	7	2	-	-	33
Eat-Release-Other	-	-	-	1	-	-	-	-	-	-	-	-	1
TOTAL*	8	12(1)	33(4)	120(6)	694(25)	345(6)	418(18)	338(22)	271(23)	199(4)	5	59(6)	2386(133)

* Total does not include 280 anglers for which use of catch was unknown.

Table 9.2-57

Residence and age group of anglers interviewed in 1982 who changed their use of catch due to the 1979 TMINIS accident.

		CHANGE	NO CHANGE	TOTAL*	% CHANGE
RESIDENCE	Cumberland	13	278	293	5.1
	Jauphin	31	575	606	5.1
	Lancaster	4	176	180	2.2
	Lebanon	3	81	84	3.6
	York	53	1286	1339	4.0
	Other	7	105	112	6.2
AGE GROUP	< 18	15	522	537	2.8
	18-29	33	709	742	4.4
	30-65	60	1101	1161	5.2
	> 65	5	169	174	2.9

* Total does not include 292 anglers for which use of catch was unknown.

Table 9.2-58

Summary of two factor analysis (chi-square tests) for the effect of month and area on anglers, fish caught, fish kept, and hours fished, May through December 1982.

Factor	Anglers	Fish Caught	Fish Kept	Hours Fished
Month	*	*	*	*
Area	*	*	*	*
Month X Area	NS	*	NS	NS

* Significant at $P \leq 0.05$.

NS Not Significant.

Table 9.2-59

Results of Duncan's new multiple range test for differences among anglers, fish caught, fish kept, and hours fished, by area, May through December 1982. Areas underlined are not significantly different ($P \leq 0.05$) and are ranked from lowest to highest mean number.

Anglers	West Dam	East Dam	GR	YRGS
Fish Caught	West Dam	East Dam	YRGS	GR
Fish Kept	West Dam	East Dam	GR	YRGS
Hours Fished	West Dam	East Dam	YRGS	GR

Table 9.2-60

Results of Duncan's new multiple range test for differences among anglers, fish caught, fish kept, and hours fished, by month, May through December 1982. Months underlined are not significantly different ($P \leq 0.05$) and are ranked from lowest to highest mean number.

Anglers	Dec	Nov	Oct	Sep	Aug	Jun	Jul	May
Fish Caught	Dec	Nov	Oct	Sep	Jul	Aug	Jun	May
Fish Kept	Dec	Nov	Sep	Oct	Aug	Jul	Jun	May
Hours Fished	Dec	Nov	Oct	Sep	Jun	Jul	Aug	May

Table 9.3-1

Yearly creel survey estimates of anglers, fish caught, fish kept, hours fished, catch/effort (c/e), and harvest/effort (h/e) calculated for 1974 through 1982.

Year	Anglers	Fish Caught	Fish Kept	Hours Fished	c/e	h/e
1974*	10837	15714	7044	19940	0.79	0.35
1975	11287	16253	8578	21220	0.77	0.40
1976	12265	19992	8623	21341	0.94	0.31
1977	7791	12089	5341	14773	0.82	0.36
1978	14089	27976	9490	27992	1.00	0.34
1979	13962	29396	7306	24546	1.20	0.30
1980	14016	36124	9160	26980	1.34	0.34
1981	19084	46784	11546	32373	1.43	0.36
1982	19914	45603	12546	34053	1.34	0.37

* Program not initiated until May.

Table 9.3-2

Monthly summary of anglers, fish caught, fish kept, hours fished, and catch/effort from the OR, 1974 through 1982.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Anglers													
1974*					113	124	143	115	83	141	14	-	733
1975	?	?	17	28	70	67	91	58	117	7	10	-	465
1976	?	?	18	45	124	188	122	148	71	4	5	?	725
1977	?	?	-	50	54	90	49	50	49	14	-	-	356
1978	?	?	?	34	90	234	111	170	147	80	28	1	895
1979	?	?	?	43	106	158	138	101	73	34	33	1	691
1980	-	?	10	22	113	141	161	171	232	76	32	-	958
1981	?	?	12	77	156	115	144	239	195	116	24	-	1118
1982	-	?	2	24	310	86	190	166	128	96	29	20	1053
Fish Caught													
1974*					179	116	183	141	204	315	6	-	1144
1975	?	?	1	28	74	105	139	153	299	6	1	-	766
1976	?	?	4	17	180	267	237	423	175	18	-	?	1321
1977	?	?	-	38	51	118	107	176	81	14	-	-	682
1978	?	?	?	62	107	328	207	247	234	126	86	-	1397
1979	?	?	?	30	105	251	300	187	269	79	44	-	1268
1980	-	?	1	15	116	249	310	486	503	205	65	-	1950
1981	?	?	1	112	193	108	258	396	754	461	17	-	2505
1982	-	?	-	61	511	189	310	569	336	245	54	5	2280
Fish Kept													
1974*					89	75	88	50	57	160	6	-	525
1975	?	?	-	24	44	84	62	58	123	1	1	-	397
1976	?	?	3	1	77	94	70	114	42	8	-	?	409
1977	?	?	-	?	72	61	75	71	30	10	-	-	348
1978	?	?	?	18	34	107	88	86	115	39	50	-	537
1979	?	?	?	?	24	48	86	37	70	41	29	-	337
1980	-	?	1	7	27	58	64	135	143	59	40	-	544
1981	?	?	-	38	78	37	89	83	223	137	11	-	696
1982	-	?	-	13	146	32	33	42	53	90	40	1	470
Hours Fished													
1974*					157.25	126.50	307.00	271.25	176.50	345.25	8.75	-	1442.50
1975	?	?	16.00	51.50	63.75	118.00	171.00	160.25	269.75	8.25	12.50	-	871.00
1976	?	?	22.50	61.25	206.50	371.25	235.25	301.82	126.33	7.50	9.00	?	1341.40
1977	?	?	-	62.33	116.91	183.25	117.16	132.75	72.75	16.50	-	-	701.65
1978	?	?	?	64.00	158.05	642.80	218.85	334.75	301.25	167.85	63.85	1.00	1952.35
1979	?	?	1.50	78.20	176.95	370.35	225.40	174.05	165.65	62.45	60.40	0.25	1319.20
1980	-	?	15.15	32.25	210.65	334.50	272.55	323.10	478.80	103.05	77.85	-	1847.90
1981	?	?	17.25	185.70	270.52	245.45	210.65	520.45	493.05	267.75	33.05	-	2241.90
1982	-	?	0.50	34.83	528.05	141.69	286.31	375.37	246.12	224.75	46.25	25.00	1908.87
Catch/Effort (h)													
1974*					1.14	0.91	0.60	0.64	1.16	0.91	0.69	-	0.79
1975	?	?	0.06	0.54	1.16	0.89	0.81	0.71	1.11	0.73	0.08	-	0.88
1976	?	?	0.18	0.28	0.87	0.72	1.01	1.40	1.38	2.40	-	?	0.98
1977	?	?	-	0.61	1.29	0.64	0.91	1.33	1.11	0.85	-	-	0.98
1978	?	?	?	0.97	0.68	0.51	0.95	0.74	0.78	0.75	1.25	-	0.72
1979	?	?	2.00	0.38	0.39	0.68	1.31	1.07	1.62	1.27	0.73	-	0.96
1980	-	?	0.07	0.47	0.35	0.74	1.14	1.50	1.05	1.99	0.83	-	1.06
1981	?	?	0.06	0.60	0.71	0.44	1.22	1.15	1.54	1.72	0.51	-	1.12
1982	-	?	-	1.75	0.97	1.33	1.08	1.52	1.36	1.09	1.17	0.20	1.19

? No Survey taken.

* Program not initiated until May.

Table 4
Monthly summary of anglers, fish caught, fish kept, hours fished, and catch/effort from the West Dam, 1974 through 1982.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	TOTAL
Anglers													
1974*	0	0	0	6	35	50	40	20	30	16	13	-	204
1975	0	0	0	2	8	21	34	-	15	4	4	-	92
1976	0	0	0	10	10	18	7	14	16	2	-	0	81
1977	0	0	0	0	12	14	14	5	4	-	4	-	53
1978	0	0	0	7	37	74	59	27	14	4	-	1	173
1979	0	0	0	22	54	57	20	10	18	12	2	-	195
1980	0	0	0	1	58	43	28	16	11	-	-	-	157
1981	0	0	7	24	56	48	29	18	12	9	6	-	209
1982	0	0	0	8	74	17	38	17	24	12	-	10	200
Fish Caught													
1974*	0	0	0	0	177	180	133	21	143	21	21	-	596
1975	0	0	0	0	51	65	49	-	19	21	14	-	219
1976	0	0	0	99	33	54	9	14	26	5	-	0	240
1977	0	0	0	0	33	33	81	19	33	-	23	-	222
1978	0	0	0	1	588	439	264	105	55	18	-	1	1187
1979	0	0	0	231	481	329	75	8	48	32	-	-	1204
1980	0	0	0	3	754	87	83	72	27	-	-	-	1026
1981	0	0	0	189	427	473	133	17	29	64	7	-	1339
1982	0	0	0	139	724	26	166	13	43	79	-	3	1193
Fish Kept													
1974*	0	0	0	0	86	48	62	8	47	9	17	-	277
1975	0	0	0	0	15	17	29	-	3	4	6	-	74
1976	0	0	0	0	10	19	-	5	7	1	-	0	42
1977	0	0	0	0	2	25	28	6	-	-	11	-	76
1978	0	0	0	0	56	46	93	32	15	2	-	1	245
1979	0	0	0	10	42	43	16	-	4	6	-	-	121
1980	0	0	0	0	52	9	39	13	22	-	-	-	135
1981	0	0	0	35	67	34	3	-	6	15	1	-	163
1982	0	0	0	13	134	5	8	-	4	3	-	-	167
Hours Fished													
1974*	0	0	0	1.50	70.75	91.00	74.50	61.50	89.25	37.00	37.00	-	661.00
1975	0	0	0	0	18.00	43.00	62.75	-	15.00	16.00	21.00	-	177.25
1976	0	0	0.50	19.00	15.00	30.50	3.00	15.50	24.00	1.50	-	-	111.00
1977	0	0	0	0	18.66	31.75	23.00	6.50	8.00	-	9.50	-	97.41
1978	0	0	0	21.25	105.55	50.50	86.35	51.25	29.50	6.00	-	4.00	354.40
1979	0	0	0	37.40	111.75	137.80	31.75	7.15	27.00	16.25	2.00	-	365.10
1980	0	0	0	2.00	132.65	62.15	44.75	28.50	30.75	-	-	-	390.80
1981	0	0	4.00	49.85	100.60	128.50	21.75	25.35	19.25	21.75	13.25	-	390.30
1982	0	0	0	14.33	180.76	24.50	65.00	37.00	56.25	18.99	-	1.00	397.23
Catch/Effort (h)													
1974*	0	0	0	0	2.50	1.98	1.79	0.34	1.60	0.57	0.57	-	1.51
1975	0	0	0	0	2.83	1.51	0.78	-	1.27	1.31	0.67	-	1.24
1976	0	0	0	0	2.20	1.77	1.80	0.90	1.08	3.33	-	0	2.16
1977	0	0	0	0	1.77	1.04	3.52	2.92	4.13	-	2.42	-	2.28
1978	0	0	0	0	5.57	2.75	3.06	2.05	1.86	3.00	-	0.25	3.35
1979	0	0	0	0	6.18	2.50	2.36	1.12	1.78	1.97	-	-	3.30
1980	0	0	0	0	1.50	5.68	1.85	2.53	0.88	-	-	-	3.41
1981	0	0	0	0	3.79	3.68	4.79	0.67	1.51	2.94	0.53	-	3.43
1982	0	0	0	0	4.02	1.06	2.55	0.35	0.76	4.16	-	3.00	3.00

† No survey taken.

* Program not initiated until May.

Table 9.3-4

Monthly summary of anglers, fish caught, fish kept, hours fished, and catch/effort from the East Dam, 1974 through 1982.

Anglers	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1974*													
1975	0	0	0	40	91	37	67	36	16	21	7	2	277
1976	0	0	25	58	90	79	27	3	18	20	4	0	281
1977	0	0	4	16	56	59	9	21	5	5	2	0	218
1978	0	0	0	21	24	10	19	3	4	8	4	1	93
1979	0	0	0	21	77	62	15	10	4	8	0	6	203
1980	2	0	20	48	75	50	72	5	24	20	9	3	306
1981	0	0	25	88	123	45	11	3	4	0	0	0	233
1982	0	0	6	38	133	144	60	9	10	14	32	2	427
													411
Fish Caught													
1974*													
1975	0	0	0	35	234	42	61	18	42	140	12	0	549
1976	0	0	1	33	164	57	20	6	47	29	0	0	358
1977	0	0	1	59	112	155	0	21	26	2	0	0	350
1978	0	0	0	26	70	16	42	3	12	8	2	0	213
1979	0	0	0	270	364	107	20	25	11	21	0	0	574
1980	0	0	22	219	121	166	37	16	173	15	87	0	907
1981	0	0	1	254	430	60	3	12	2	0	0	0	726
1982	0	0	0	61	731	251	19	46	10	46	23	0	1381
													1295
Fish Kept													
1974*													
1975	0	0	0	20	50	12	37	6	10	101	10	0	222
1976	0	0	1	1	63	25	3	1	29	10	0	0	151
1977	0	0	0	7	24	34	0	5	3	0	0	0	68
1978	0	0	0	1	18	10	18	1	0	2	0	0	39
1979	0	0	0	1	25	24	6	4	10	2	0	0	72
1980	0	0	0	26	22	14	3	1	50	1	5	0	122
1981	0	0	0	25	73	15	1	0	2	0	0	0	116
1982	0	0	0	84	131	32	6	8	4	21	4	0	290
													418
Hours fished													
1974*													
1975	0	0	0	57.50	175.50	76.00	153.25	43.75	22.75	60.00	14.25	6.00	551.50
1976	0	0	17.00	30.25	177.00	110.00	26.25	7.50	22.00	86.00	4.00	0	490.25
1977	0	0	5.25	35.00	72.00	93.25	5.25	16.23	6.83	8.00	0.50	0	249.41
1978	0	0	0	37.50	37.66	21.50	23.00	3.75	7.50	15.00	8.50	1.00	158.16
1979	0	0	43.35	85.40	176.75	113.40	39.10	21.35	5.50	13.75	0	6.70	414.50
1980	0.15	0	0	58.70	83.75	89.55	36.90	8.00	47.65	15.65	22.50	0	435.25
1981	0	0	18.90	136.15	191.45	70.60	6.85	3.35	2.00	0	0	0	333.10
1982	0	0	1.15	32.00	196.25	94.65	44.40	28.50	2.15	38.25	23.30	6.25	582.80
													574.40
Catch/Effort (h)													
1974*													
1975	0	0	0	0.61	1.33	0.55	0.40	0.41	1.85	2.33	0.84	0	0.99
1976	0	0	0.06	1.09	0.93	0.53	0.76	0.86	2.14	0.34	0	0	0.73
1977	0	0	0.19	1.69	1.56	1.66	0	1.35	3.81	0.25	0	0	1.40
1978	0	0	0	0.69	1.86	0.79	1.83	0.80	1.60	0	0.24	0	1.35
1979	0	0	0.51	3.16	2.06	0.94	0.51	1.17	2.00	1.00	3.87	0	1.39
1980	0	0	0	3.73	1.44	1.85	1.00	2.00	3.63	0.96	0	0	2.08
1981	0	0	0.05	1.87	3.72	2.65	0.53	3.56	1.00	1.20	0.99	0	2.18
1982	0	0	0	1.91	2.25	2.81	1.59	1.61	4.65	0.83	1.00	0.33	2.37
													2.25

0 No surveys taken.

* Program not initiated until May.

Table 9.3-5

Monthly summary of anglers, fish caught, fish kept, hours fished, and catch/effort from the YBCS, 1974 through 1982.

Anglers	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
1974*													
1975	22	34	48	56	224	147	123	114	61	99	48	9	825
1976	8	128	134	137	127	154	137	96	75	57	32	7	850
1977	-	34	51	133	182	137	83	105	53	64	13	3	995
1978	-	-	2	137	116	101	52	65	86	58	18	2	716
1979	16	7	64	139	225	177	160	151	100	107	42	13	980
1980	9	10	49	136	175	213	151	126	149	87	46	13	1151
1981	-	24	41	88	198	140	134	111	153	82	38	2	1144
1982	9	13	27	66	278	148	4	167	127	107	70	26	1031
1982													1202
Fish Caught													
1974*					90	140	100	119	40	63	13	-	365
1975	8	14	18	30	229	183	179	179	126	93	25	4	1088
1976	1	75	30	73	198	383	170	216	139	84	1	-	1370
1977	-	2	30	153	104	127	53	92	148	55	6	-	370
1978	-	-	1	61	196	248	378	219	82	106	36	5	1332
1979	2	2	39	258	335	259	191	163	104	93	104	4	1554
1980	1	-	7	147	343	466	200	188	231	320	15	-	1918
1981	-	1	2	151	487	163	135	141	190	267	7	-	1544
1982	-	4	38	83	562	167	257	281	158	139	94	18	1801
Fish Kept													
1974*					31	106	48	62	21	35	3	-	306
1975	4	14	9	20	119	105	136	119	51	61	22	-	613
1976	-	38	27	41	90	134	53	116	44	32	1	-	470
1977	-	-	15	85	49	61	28	29	71	33	1	-	272
1978	-	-	-	30	58	160	201	131	34	38	12	5	639
1979	1	-	15	66	124	72	106	98	21	55	86	2	646
1980	1	-	2	13	42	109	96	116	130	113	8	-	630
1981	-	-	1	61	176	85	58	46	54	51	4	-	536
1982	-	-	2	32	263	75	83	100	86	60	55	4	760
Hours Fished													
1974*					337.50	224.25	199.50	203.25	93.00	169.25	64.75	10.25	1301.75
1975	45.75	52.50	77.75	71.00	189.50	316.50	284.25	284.75	145.00	101.25	39.00	20.50	1627.75
1976	2.75	244.00	116.50	210.50	286.25	325.00	150.30	216.08	112.25	133.17	16.93	1.50	1817.23
1977	-	35.94	78.00	275.25	198.82	222.34	101.50	138.75	151.25	125.75	22.25	2.50	1352.35
1978	-	2.00	12.25	153.50	191.90	422.70	306.85	241.55	145.50	203.60	81.35	10.60	1771.60
1979	19.25	6.75	62.10	240.00	401.65	415.45	246.30	245.75	165.85	94.80	84.40	17.25	1999.55
1980	5.00	5.75	28.85	121.15	236.30	364.15	246.05	262.70	242.50	165.65	46.65	10.90	1715.65
1981	-	21.10	34.15	129.85	376.45	229.45	187.25	172.35	191.95	123.60	40.15	1.00	1507.30
1982	4.15	16.85	36.30	85.40	534.73	203.57	305.33	335.60	200.93	174.59	89.26	26.66	2013.37
Catch/Effort (h)													
1974*					0.27	0.62	0.50	0.59	0.43	0.37	0.20	-	0.43
1975	0.17	0.27	0.23	0.42	1.21	0.58	0.63	0.63	0.87	0.92	0.64	0.20	0.67
1976	0.36	0.31	0.26	0.35	0.69	1.18	1.12	1.00	1.24	0.63	0.06	-	0.75
1977	-	0.06	0.36	0.55	0.52	0.58	0.52	0.66	0.97	0.44	0.27	-	0.57
1978	-	-	0.08	0.60	1.02	0.59	1.23	0.91	0.56	0.52	0.44	0.48	0.75
1979	0.10	0.30	0.63	1.08	0.83	0.62	0.78	0.66	0.63	0.98	1.23	0.23	0.78
1980	0.20	-	0.24	1.21	1.45	1.28	0.81	0.77	0.95	1.93	0.32	-	1.12
1981	-	0.05	0.06	1.16	1.29	0.71	0.72	0.82	0.99	2.16	0.17	-	1.02
1982	-	0.24	1.05	0.97	1.05	0.82	0.84	0.83	0.79	0.80	1.05	0.68	0.89

* Program not initiated until May.

Table 9.3-6

Summary of two factor analysis of variance tests for annual number of anglers, fish caught, fish kept, and hours fished at each creel survey area, April through November 1975 through 1982.

Factor	Anglers	Fish Caught	Fish Kept	Hours Fished
Area	*	*	*	*
Year	*	*	*	*
Area X Year	NS	NS	NS	NS

* Significant at $P \leq 0.05$.
NS Not Significant.

Table 9.3-7

Results of Duncan's new multiple range tests for differences among anglers, fish caught, fish kept, and hours fished, by area and year April through November 1975 through 1982. Areas and years underlined were not significantly different ($P \leq 0.05$) and were ranked from lowest to highest mean number.

	AREAS				YEARS							
	West Dam	East Dam	GR	YHGS	1977	1975	1976	1979	1978	1980	1981	1982
Anglers	<u>West Dam</u>	<u>East Dam</u>	GR	YHGS	1977	1975	1976	1979	1978	1980	1981	1982
Fish Caught	East Dam	<u>West Dam</u>	YHGS	GR	1977	1975	1976	1979	1978	1980	1982	1981
Fish Kept	<u>West Dam</u>	East Dam	GR	YHGS	1977	1976	1979	1975	1980	1978	1981	1982
Hours Fished	<u>West Dam</u>	East Dam	GR	YHGS	1977	1975	1976	1979	1980	1978	1981	1982

Table 9.3-8

Summary of yearly creel survey totals for anglers, fish caught, fish kept, hours fished, catch/effort (c/e), and harvest/effort (h/e), 1974 through 1982.

	Anglers	Fish Caught	Fish Kept	Hours Fished	c/e	h/e
1974*	2039	2954	1329	3757	0.79	0.35
1975	1688	2431	1282	3166	0.77	0.40
1976	2019	3281	1095	3519	0.93	0.31
1977	1218	1890	835	2310	0.82	0.36
1978	2261	4490	1523	4492	1.00	0.34
1979	2343	4933	1226	4119	1.20	0.30
1980	2492	5620	1425	4197	1.34	0.34
1981	2785	6769	1685	4724	1.43	0.36
1982	2866	6569	1815	4894	1.34	0.37

* Program not initiated until May.

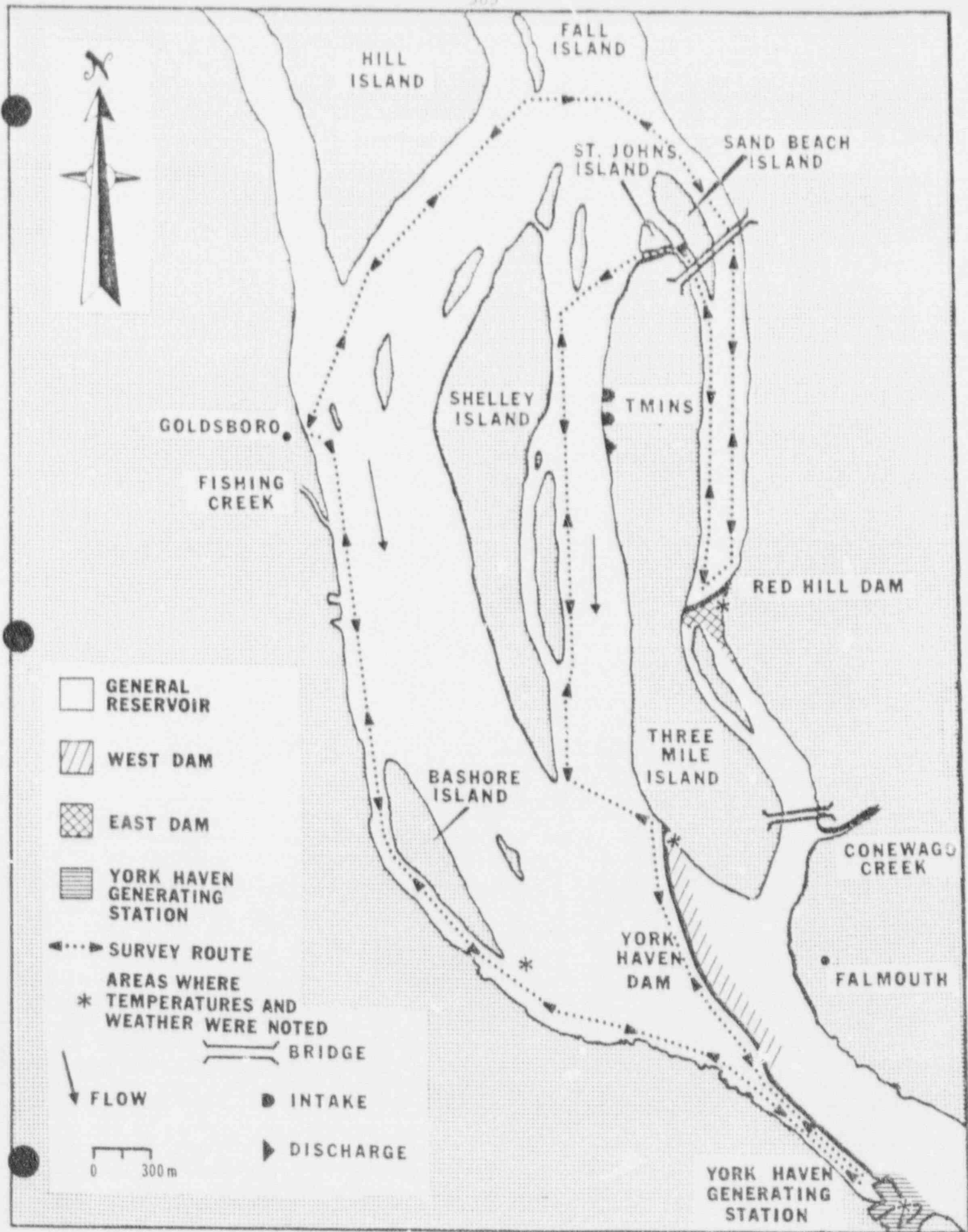


Figure 9.1-1. Location of creel survey areas.

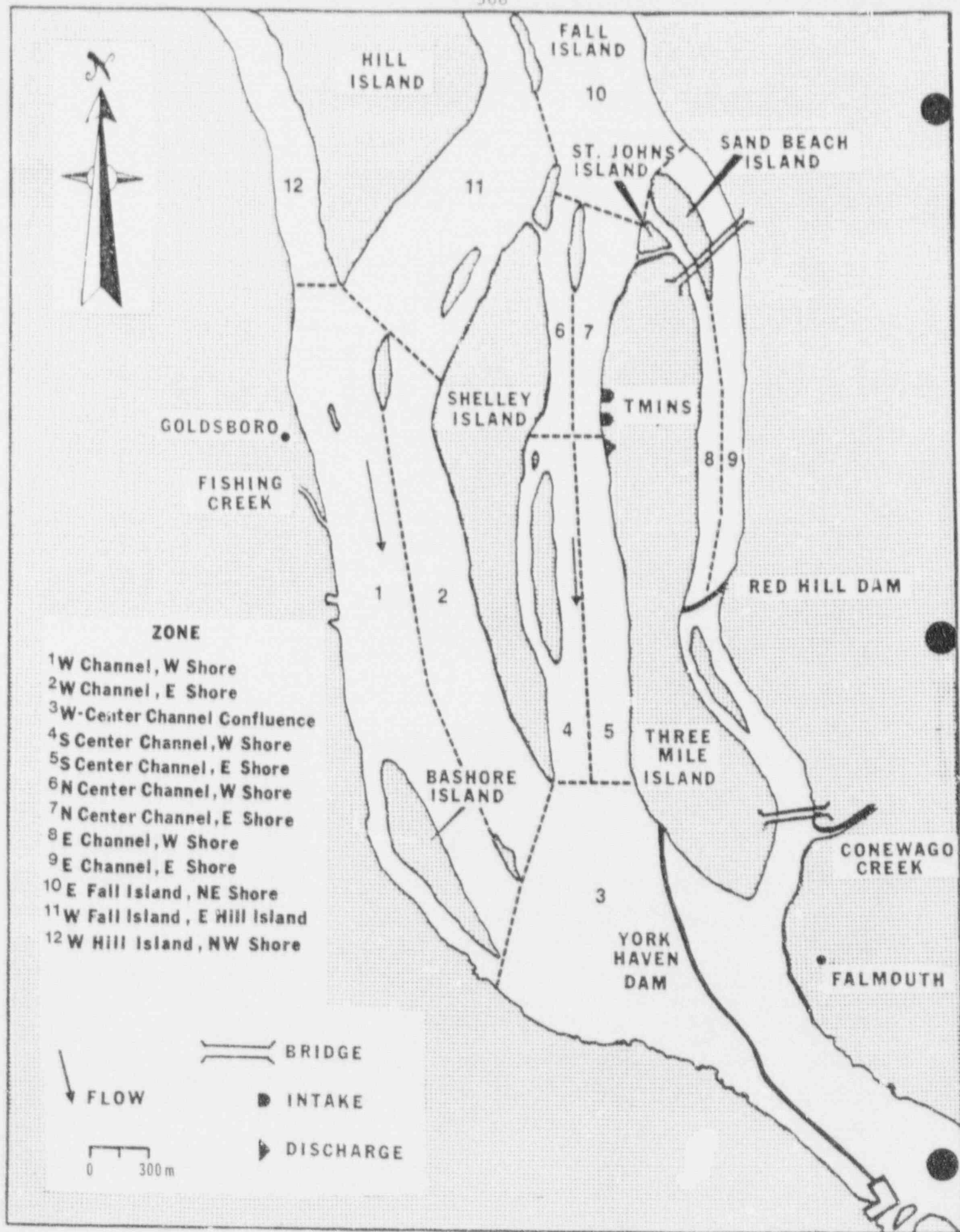


Figure 9.1-2. Location of the 12 creel survey zones in the General Reservoir area of York Haven Pond.

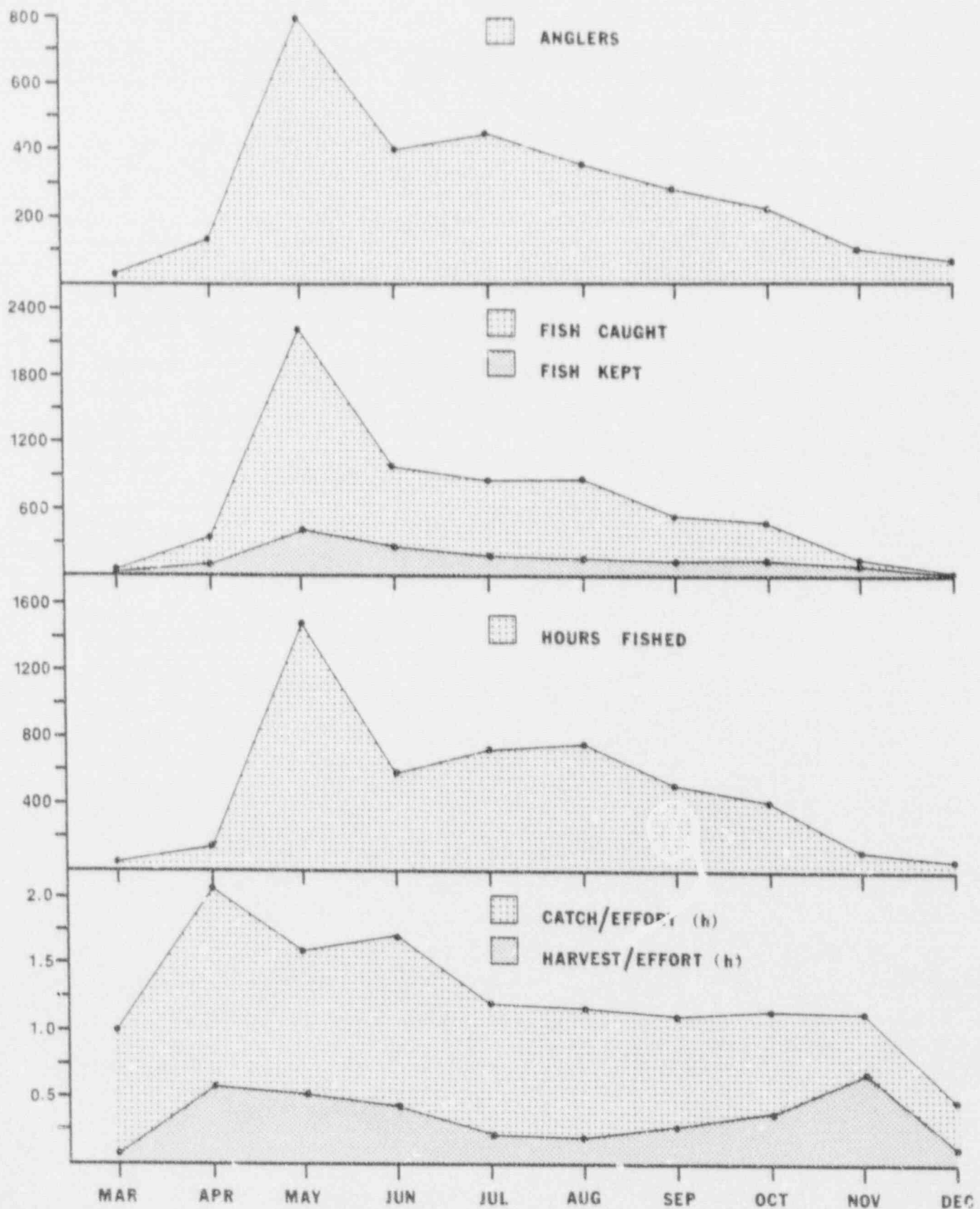


Figure 9.2-1. Monthly comparison of anglers, fish caught, fish kept, hours fished, catch/effort, and harvest/effort, March through December 1982.

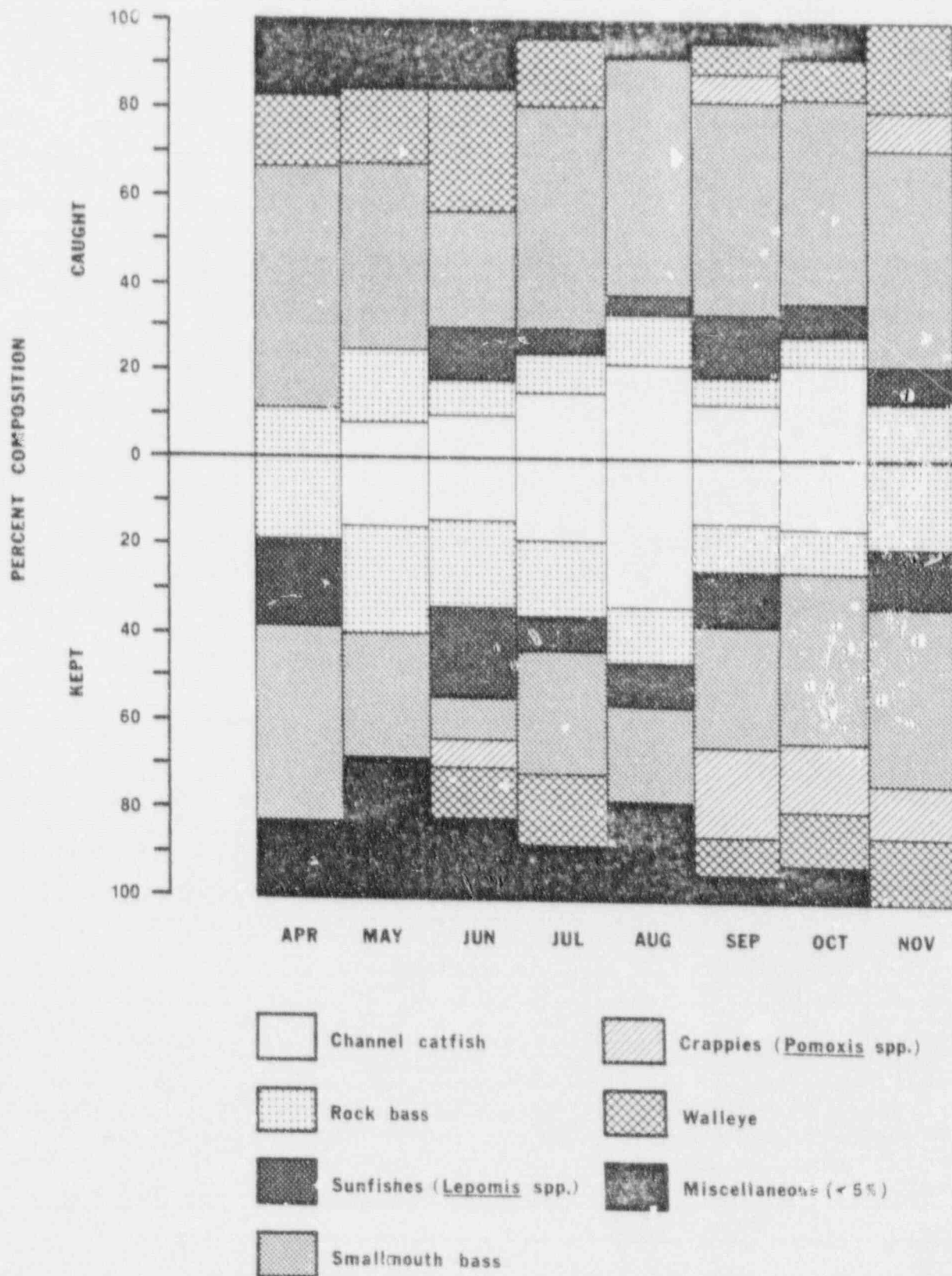


Figure 9.2-2. Percent composition of fishes caught and kept from the Susquehanna River near TMINS, April through November 1982.

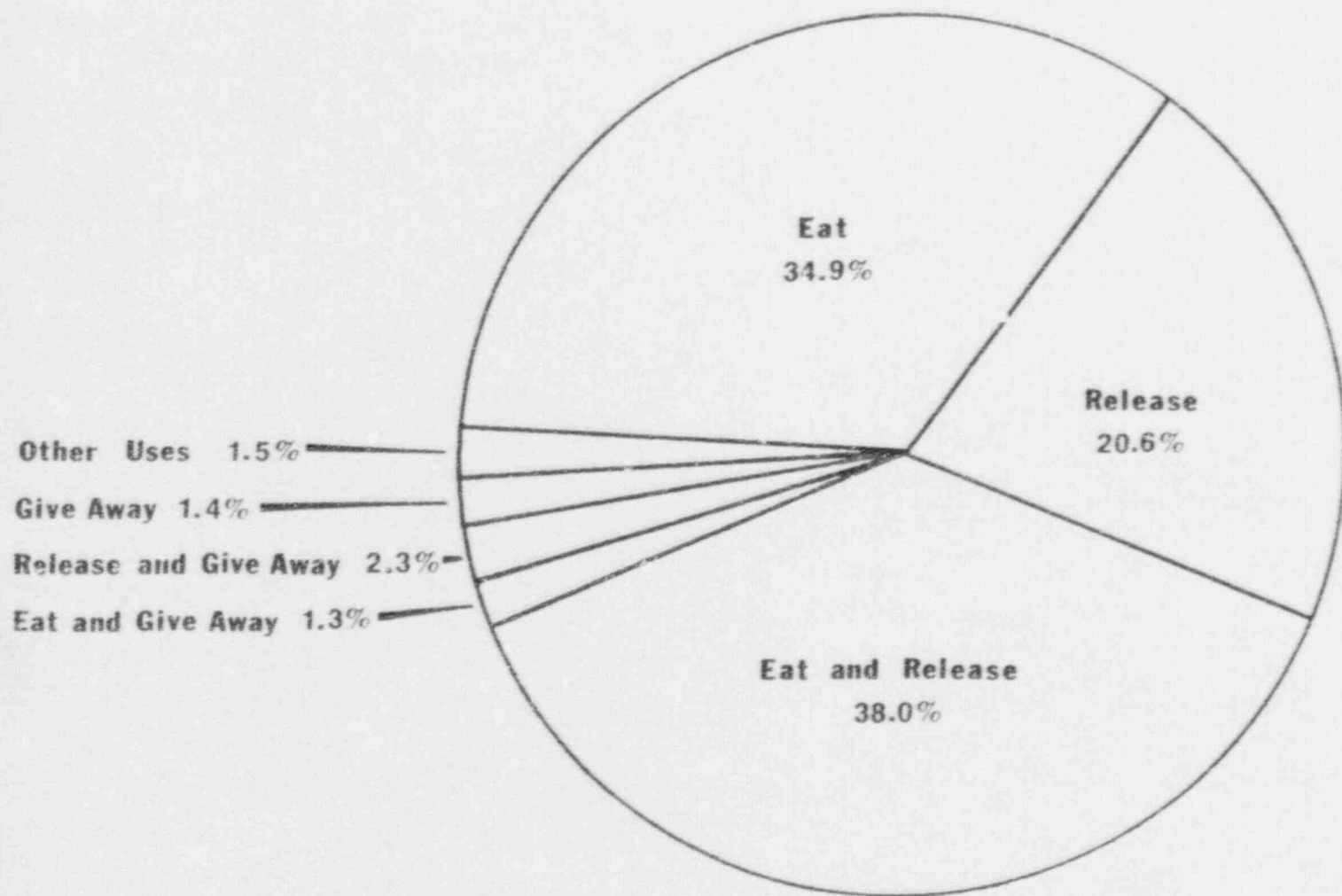


Figure 9.2-3. Use of catch by anglers fishing in the Susquehanna River near TMINS in 1982.

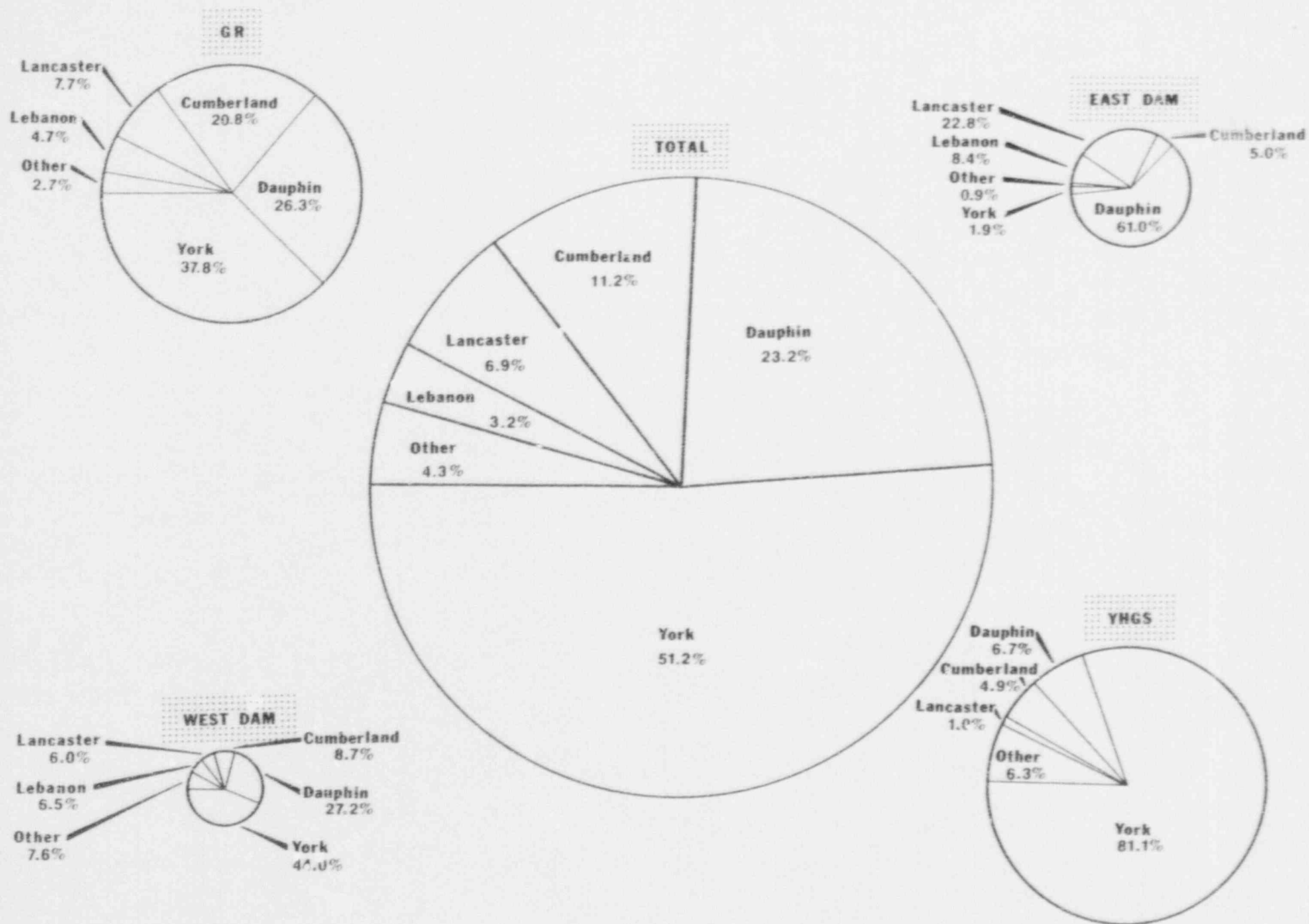


Figure 9. Percent of anglers, by county, interviewed at each creel survey area near TMINS in 1982 is proportionally represented.

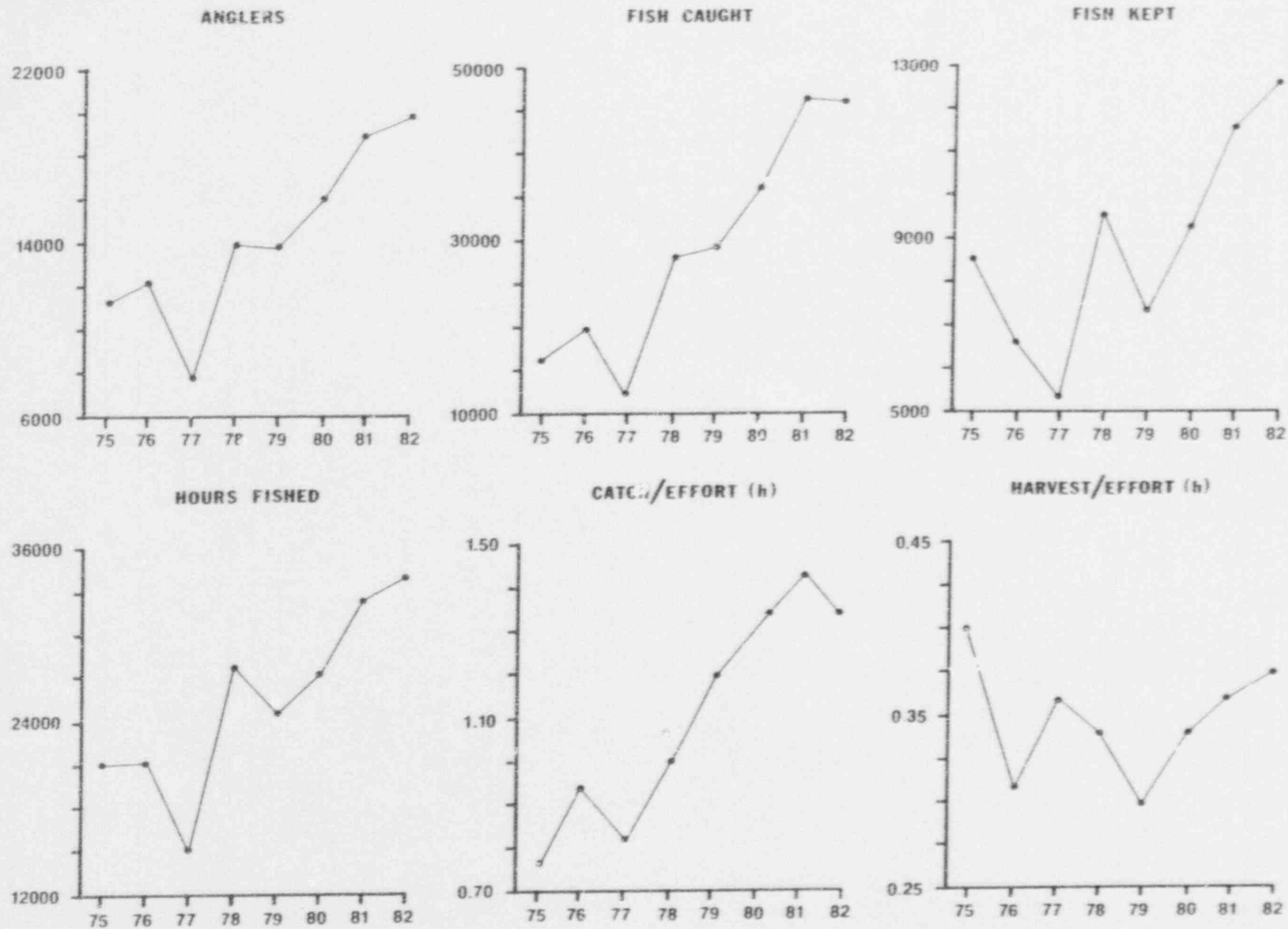


Figure 9.3-1. Creel survey estimates of anglers, fish caught, fish kept, hours fished, catch/effort, and harvest/effort from the Susquehanna River near TMI NS, 1975 through 1982.

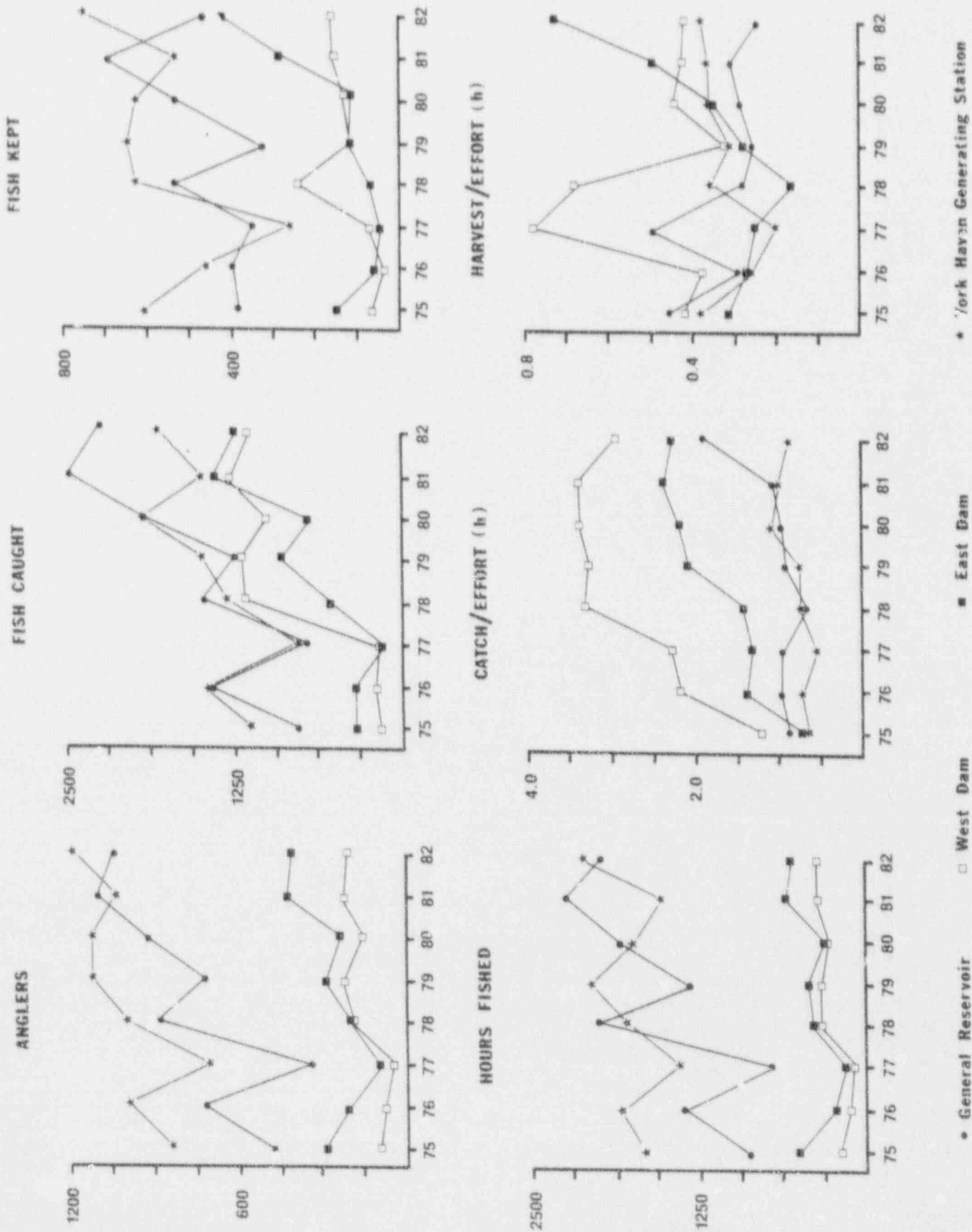


Figure 9.3-2. Anglers, fish caught, fish kept, hours fished, catch/effort, and harvest/effort at each creel survey area from the Susquehanna River near IMRS, 1975 through 1982.

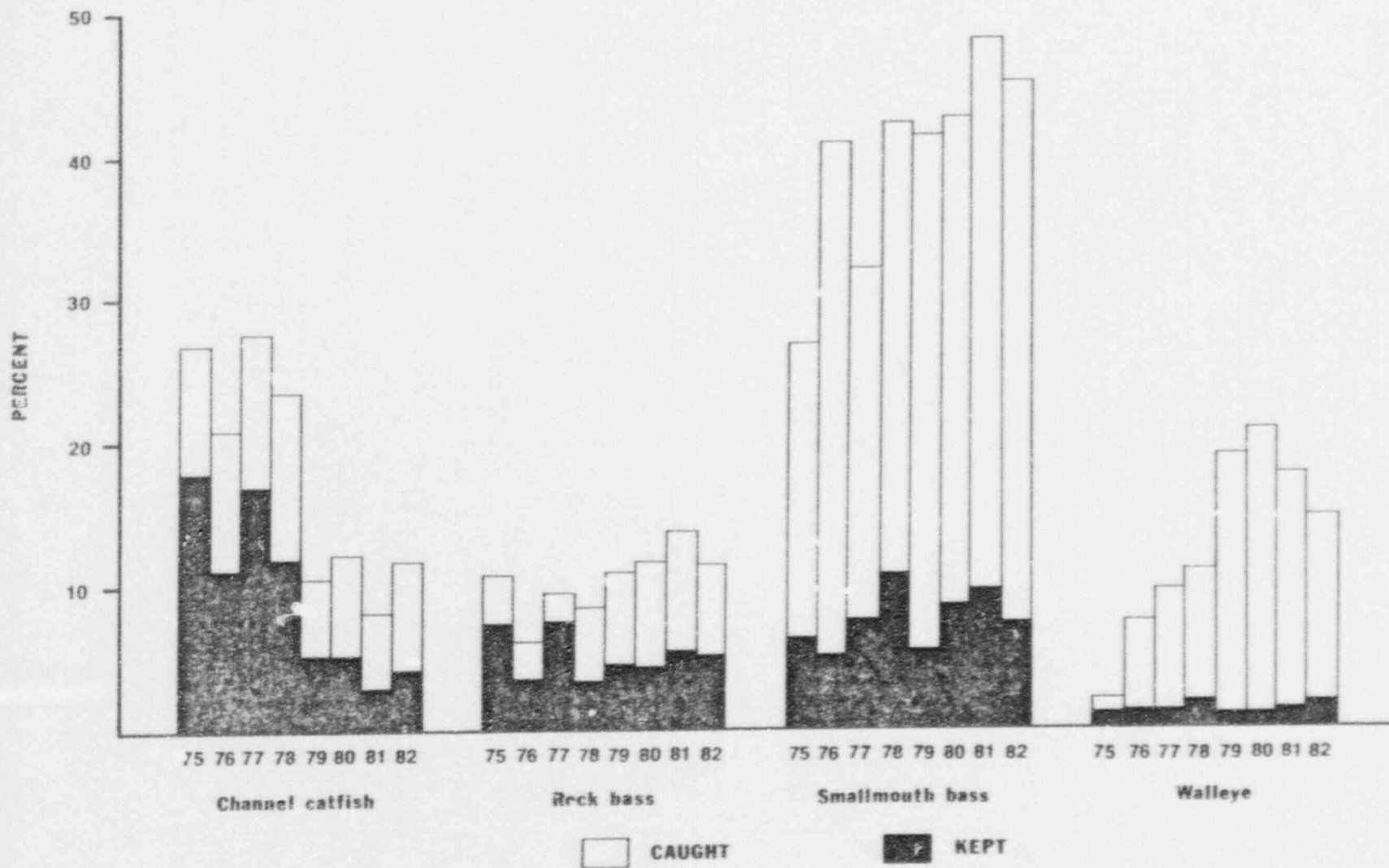


Figure 9.3-3. Percent composition of channel catfish, rock bass, smallmouth bass, and walleye caught and kept by anglers fishing in the Susquehanna River near TMINS, 1975 through 1982.

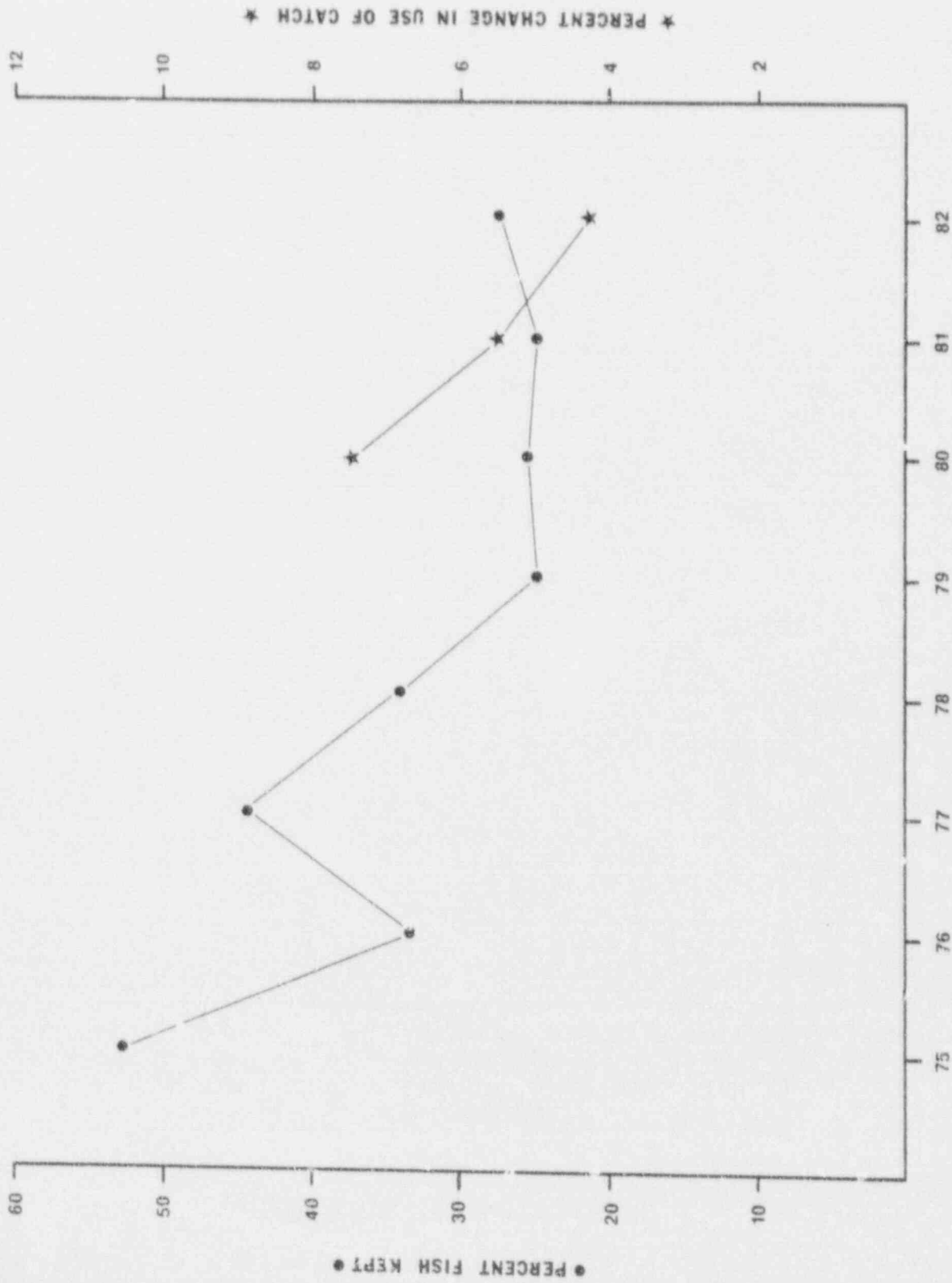


Figure 9.3-4. Total percent fish kept (1975 through 1982) and percent change in use of catch (1980 through 1982) for anglers interviewed during creel surveys in the Susquehanna River near TMINs.

10.0 WATER QUALITY

Selected water quality parameters were analyzed to determine the physical and chemical characteristics of the Susquehanna River near TMINS and compare these data to established water quality criteria for the Commonwealth of Pennsylvania.

10.1 METHODS

Surface water samples for chemical analysis were collected once in January and semimonthly March through December 1982 at the five macroinvertebrate stations (described in Section 2.0, Table 2.1-1 and Figure 2.1-1). Ice cover prevented sampling in late January and throughout February.

A one gallon sample was collected at each station, placed in a precleaned polyethylene bottle in the field, and transported in an insulated plastic cooler at about 4 C to the General Public Utilities Service Corporation Laboratory in Reading, Pennsylvania. Laboratory analyses for turbidity, alkalinity, sulfate, total dissolved solids, total copper, dissolved copper, total zinc, and dissolved zinc were performed by accepted analytical methods prepared by the American Public Health Association, Inc. (1975), American Society for Testing and Materials (1973), and Environmental Protection Agency (1976). Surface water temperature, pH, and dissolved oxygen concentration were determined in the field for all macroinvertebrate, ichthyoplankton, trapnet, seine, and electrofishing collections to evaluate the trends of these parameters within York Haven Pond. These data were separated into zones (Figure 10.1-1) to facilitate analysis of trends.

Values for the parameters analyzed in 1982 at each station were ranked and compared by a nonparametric two-way classification test described in Wilcoxon and Wilcox (1964). This test was used to compare several samples which have a number of observations taken under different conditions. The test was used to determine if significant differences existed between stations during 1982. Data were also compared by a two factor analysis of variance (ANOVA) test to determine differences among stations and years (1978 through 1982) (Sokal and Rohlf 1973). The Student-Newman-Keuls (SNK) multirange test was used to compare means when the ANOVA indicated initial differences (Steel and Torrie 1960).

The 1982 data were compared to criteria presented in Table 10.1-1 which were established for the Commonwealth of Pennsylvania by the Department of Environmental Resources (1979).

10.2 RESULTS

Results of analyses for the water quality stations are reported in Tables 10.2-1 through 10.2-11 and summarized in Table 10.2-12. Means and standard deviations for water temperature and dissolved oxygen and minimum and maximum values for pH (obtained from macro-invertebrate, ichthyoplankton, trapnet, seine, and electrofishing data) are presented by zone in Tables 10.2-13 through 10.2-15.

Mean values for dissolved oxygen, total copper, and total zinc were highest in January (Table 10.2-12); dissolved zinc was highest in April. All other parameters were highest at various times during June through October. Most of the data collected in 1982

were within the ranges that have been established since 1978. However, new maxima for turbidity (65.0 NTU on 10 June) and total copper (0.020 mg/l on 1 November) were recorded (Tables 10.2-5 and 10.2-10, respectively).

Differences between zones for water temperature, dissolved oxygen, and pH values suggested no increasing or decreasing trends within zones located upstream (7) or downstream (8 or 9) of the Discharge (Tables 10.2-13 through 10.2-15). Water temperature was highest at all zones in July; dissolved oxygen was highest at most zones in January and/or December. The pH values had their widest range in July; highest pH values occurred in August.

Results of the 1982 nonparametric two-way classification test revealed that the ranks of water temperature, dissolved oxygen, alkalinity, sulfate, total dissolved solids, total copper, and dissolved copper were significantly different between stations ($P = 0.05$). All other parameters were not significantly different. An increase in water temperature between upstream and downstream stations was noted. Water temperature values were significantly higher at Station 9B1 than at 1A2. Dissolved oxygen values at Station 1A1 were lower and significantly different from all other stations. Alkalinity values were significantly higher at Stations 1A2, 11A1, and 11A2 than at 1A1. Sulfate values were significantly higher at Station 1A1 than at all other stations. Values for total dissolved solids and total copper were significantly higher at Stations 1A1 and 11A2

than at 1A2. Values for dissolved copper were significantly higher at Station 11A1 than at 1A2. Excepting dissolved copper, differences in water quality parameters were attributed to surface runoff during periods of increased river flow, upstream wastewater discharges, tributary input, and other non-point sources. Causes of dissolved copper differences were not apparent.

Results of the two factor ANOVA showed significant station and/or yearly (1978 through 1982) differences for alkalinity, sulfate, total dissolved solids, total copper, dissolved copper, and total zinc (Table 10.2-16). Results of all other parameters were not significantly different and were not presented. Interaction effects were not significantly different. The SNK test was applied to station and year means; results are presented in Tables 10.2-17 and 10.2-18. Alkalinity was lowest at Station 1A1 and significantly different from all other stations. The yearly mean for alkalinity was highest in 1980 and significantly different from all other years except 1982. Sulfate was highest at Station 1A1 and significantly different from all other stations; Stations 11A1, 11A2, and 9B1 were similar and significantly different from Station 1A2. The yearly means for sulfate and total dissolved solids were highest in 1980 and significantly different from the other years. Drought conditions which caused below normal river flow throughout eastern Pennsylvania during 1980 (U.S. Department of the Interior 1980) may have resulted in the annual means of these parameters being much greater than

previous years. Total copper was highest in 1978 and significantly different from all other years. Dissolved copper was lowest in 1982 and significantly different from all years. No significant difference between years was noted for total zinc. Temporal variability in water quality parameters may be partially attributable to river flow differences between sample years.

10.3 DISCUSSION

In 1982 pH and turbidity were the only water quality parameters that exceeded State limits (Table 10.1-1). The pH upper limit was exceeded at Stations 1A1, 1A2, and 11A1 in April, May, or June (Tables 10.2-3 through 10.2-5). The pH upper limit was also exceeded at various times during most other sampling programs, March through August (Table 10.2-15). Turbidity exceeded the State upper limit at all stations on 10 June (Table 10.2-5) and coincided with increased river flow resulting from heavy rain during late May through mid-June.

No adverse effects on the water quality in the Susquehanna River near TMINS were observed in 1982. The seasonal and spatial variations of most water quality parameters reflected the inflow of water from numerous point and non-point sources. Varied geology and land and water use practices throughout the Susquehanna River Basin (71,000 km^2) influence the wide natural range of the selected water quality parameters and may surpass any minor changes associated with TMINS.

Table 10.1-1

Water quality criteria for selected physicochemical parameters analyzed near EMINS, Pennsylvania
Department of Environmental Resources (1979).

Parameter	Criteria
Alkalinity	Equal to or greater than 20 mg/l as CaCO ₃ , except where natural conditions are less. Where discharges are to waters with 20 mg/l or less alkalinity, the discharge should not further reduce the alkalinity of the receiving waters.
Copper	Not to exceed 0.1 of the 96-hour LC50 for representative important species as determined through substantial available literature data or bioassay tests tailored to the ambient quality of the receiving waters.
Dissolved Oxygen	Minimum daily average 5.0 mg/l; no value less than 4.0 mg/l. For the epilimnion of lakes, ponds, and impoundments, minimum daily average of 5.0 mg/l, no value less than 4.0 mg/l.
pH	Not less than 6.0 and not more than 9.0.
Sulfate	Not to exceed 250 mg/l.
Temperature (water)	No rise when ambient temperature is 87 F. or above; not more than a 5 F. rise above ambient temperature until stream temperature reaches 87 F.; not to be changed by more than 2 F. during any one-hour period.
Total Dissolved Solids	Not more than 500 mg/l as a monthly average value; not more than 750 mg/l at any time.
Turbidity	Not more than 30 NTU during the period 5/30-9/15, nor more than a monthly mean of 40 NTU or a maximum of 150 NTU during the remainder of the year.
Zinc	Not to exceed 0.01 of the 96-hour LC50 for representative important species as determined through substantial available literature data or bioassay tests tailored to the ambient quality of the receiving waters.

Table 10.2-1

Summary of selected physicochemical parameters taken on 6 January 1982 near the THINE. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TH-AQ1-1A1	6 Jan	1.0	7.9	13.2	23.0	26.8	32.1	138	0.012	0.002	0.020	0.015
TH-AQ1-1A2		1.0	8.0	13.4	21.0	29.3	26.3	139	0.010	0.001	0.064	0.014
TH-AQ1-11A1		1.5	8.1	13.5	20.0	29.3	39.1	138	0.015	0.002	0.062	0.012
TH-AQ1-11A2		1.0	8.0	13.6	24.0	29.3	39.9	140	0.013	0.002	0.067	0.012
TH-AQ1-9B1		1.0	8.2	13.2	20.0	27.3	38.3	146	0.009	0.003	0.030	0.010

Table 10.2-2

Summary of selected physicochemical parameters taken on 8 and 31 March 1982 near the THINE. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TH-AQ1-1A1	8 Mar	0.0	8.2	12.0	33.0	66.7	38.3	182	0.006	0.002	0.029	0.003
TH-AQ1-1A2		0.0	8.2	12.0	23.0	66.2	37.5	165	0.006	0.005	0.016	0.013
TH-AQ1-11A1		0.5	8.2	12.6	22.0	45.2	60.7	181	0.005	0.002	0.020	0.003
TH-AQ1-11A2		2.0	8.3	12.2	32.0	65.2	60.7	189	0.005	0.002	0.036	0.005
TH-AQ1-9B1		1.5	8.3	12.1	25.0	65.2	37.5	177	0.006	0.002	0.017	0.007
TH-AQ1-1A1	31 Mar	5.5	8.2	12.6	18.0	23.1	26.8	92	0.006	0.002	0.027	0.011
TH-AQ1-1A2		5.5	8.1	12.6	16.0	23.6	16.5	91	0.002	0.001	0.019	0.010
TH-AQ1-11A1		5.5	8.4	12.8	18.0	23.6	23.9	87	0.002	0.002	0.022	0.009
TH-AQ1-11A2		5.5	8.5	12.8	20.0	23.6	23.0	89	0.006	0.002	0.021	0.013
TH-AQ1-9B1		5.5	8.5	12.6	20.0	23.1	24.7	88	0.003	0.001	0.023	0.011
MEAN VALUES FOR MARCH 1982												
TH-AQ1-1A1	Mar	2.8	-	12.3	25.5	33.9	32.6	137	0.005	0.002	0.028	0.007
TH-AQ1-1A2		2.8	-	12.3	19.5	33.9	27.0	128	0.003	0.002	0.018	0.012
TH-AQ1-11A1		3.0	-	12.6	20.0	34.6	32.3	136	0.006	0.002	0.021	0.006
TH-AQ1-11A2		3.8	-	12.5	26.0	36.4	31.8	136	0.002	0.002	0.032	0.009
TH-AQ1-9B1		3.5	-	12.4	22.5	36.2	31.1	132	0.006	0.002	0.020	0.009

Table 10.2-3

Summary of selected physicochemical parameters taken on 12 and 29 April 1982 near the THINS. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TM-AQ1-1A1	12 Apr	5.5	9.1	11.3	14.5	26.1	37.5	122	0.003	0.001	0.035	0.016
TM-AQ1-1A2		5.5	9.0	11.4	12.0	27.3	23.5	117	0.002	0.001	0.027	0.017
TM-AQ1-11A1		5.5	8.9	11.6	12.0	28.1	34.6	120	0.003	0.002	0.026	0.018
TM-AQ1-11A2		5.5	8.8	11.6	13.0	28.1	35.8	125	0.003	0.002	0.027	0.016
TM-AQ1-9B1		6.0	8.6	11.5	13.0	28.1	35.4	126	0.003	0.001	0.026	0.018
TM-AQ1-1A1	29 Apr	12.0	9.4	9.6	9.5	28.3	52.3	134	0.004	0.002	0.030	0.013
TM-AQ1-1A2		12.0	9.4	9.6	7.4	27.3	37.0	140	0.002	0.002	0.019	0.012
TM-AQ1-11A1		12.0	9.1	10.0	7.8	27.3	52.3	137	0.002	0.002	0.021	0.013
TM-AQ1-11A2		12.0	8.5	10.0	10.0	27.3	43.2	142	0.003	0.002	0.022	0.012
TM-AQ1-9B1		12.0	8.4	9.9	6.0	27.3	52.7	137	0.002	0.002	0.024	0.013
MEAN VALUES FOR APRIL 1982												
TM-AQ1-1A1	Apr	8.8	-	10.4	12.0	27.2	44.9	128	0.004	0.002	0.032	0.014
TM-AQ1-1A2		8.8	-	10.5	9.7	27.2	30.2	128	0.002	0.002	0.023	0.014
TM-AQ1-11A1		8.8	-	10.8	9.9	27.7	43.4	128	0.002	0.002	0.024	0.016
TM-AQ1-11A2		8.8	-	10.8	11.5	27.7	39.5	134	0.003	0.002	0.024	0.014
TM-AQ1-9B1		9.0	-	10.7	9.5	27.7	44.0	132	0.002	0.002	0.025	0.016

Table 10.2-4

Summary of selected physicochemical parameters taken on 10 and 24 May 1982 near the THINS. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TM-AQ1-1A1	10 May	6.0	7.0	9.8	4.4	35.9	71.6	170	0.002	0.002	0.014	0.01
TM-AQ1-1A2		16.0	7.2	9.9	12.0	53.5	22.2	255	0.004	0.002	0.029	0.01
TM-AQ1-11A1		16.0	6.8	9.6	9.5	52.5	38.7	169	0.002	0.002	0.019	0.013
TM-AQ1-11A2		16.0	8.9	9.6	5.5	51.5	42.0	172	0.003	0.002	0.023	0.014
TM-AQ1-9B1		16.0	8.6	9.5	5.0	51.5	41.2	166	0.005	0.002	0.022	0.012
TM-AQ1-1A1	24 May	16.0	8.9	8.2	4.0	48.2	78.2	191	0.006	0.002	0.014	0.001
TM-AQ1-1A2		16.0	8.8	7.8	4.5	69.4	28.0	183	0.005	0.002	0.016	0.001
TM-AQ1-11A1		16.0	8.6	8.4	3.9	65.3	46.1	183	0.006	0.002	0.013	0.001
TM-AQ1-11A2		16.0	8.6	8.4	4.0	65.3	43.6	188	0.006	0.002	0.011	0.001
TM-AQ1-9B1		16.0	8.6	7.9	6.0	65.8	50.6	185	0.006	0.002	0.016	0.001
MEAN VALUES FOR MAY 1982												
TM-AQ1-1A1	May	16.0	-	9.0	4.2	42.0	74.9	180	0.003	0.002	0.014	0.006
TM-AQ1-1A2		16.0	-	8.8	8.2	61.4	25.1	169	0.004	0.002	0.022	0.006
TM-AQ1-11A1		16.0	-	9.0	6.7	58.9	42.4	176	0.003	0.002	0.016	0.007
TM-AQ1-11A2		16.0	-	3.0	5.2	58.4	42.8	180	0.006	0.002	0.017	0.008
TM-AQ1-9B1		16.0	-	8.7	5.5	58.6	51.9	176	0.006	0.002	0.019	0.006

Table 10.2-5

Summary of selected physicochemical parameters taken on 10 and 21 June 1982 near the IMINE. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TM-AQ1-1A1	10 Jun	17.0	9.1	8.9	58.0	26.1	30.5	111	0.008	0.002	0.048	0.008
TM-AQ1-1A2		17.0	9.0	10.2	60.0	27.1	28.0	107	0.009	0.002	0.044	0.006
TM-AQ1-11A1		17.0	9.1	9.2	65.0	27.6	30.0	114	0.010	0.002	0.045	0.004
TM-AQ1-11A2		17.0	8.6	9.1	62.0	27.1	28.0	107	0.011	0.002	0.035	0.003
TM-AQ1-9B1		17.0	8.3	9.7	65.0	27.6	27.6	108	0.011	0.002	0.043	0.004
TM-AQ1-1A1	21 Jun	20.0	8.5	8.6	16.0	44.0	35.0	149	0.005	0.002	0.020	0.005
TM-AQ1-1A2		20.5	8.3	8.6	14.0	45.0	34.7	150	0.003	0.001	0.019	0.006
TM-AQ1-11A1		20.5	8.1	8.7	15.0	46.0	30.0	143	0.005	0.002	0.021	0.007
TM-AQ1-11A2		20.5	8.0	8.6	15.5	45.5	23.0	147	0.005	0.002	0.023	0.006
TM-AQ1-9B1		20.5	8.0	9.0	10.0	46.5	31.0	148	0.003	0.002	0.017	0.005
MEAN VALUES FOR JUNE 1982												
TM-AQ1-1A1	Jun	18.5	-	8.8	37.0	35.0	32.8	130	0.006	0.002	0.034	0.006
TM-AQ1-1A2		18.8	-	9.4	37.0	36.0	31.1	128	0.006	0.002	0.032	0.006
TM-AQ1-11A1		18.8	-	9.0	40.0	36.8	30.0	128	0.008	0.002	0.033	0.006
TM-AQ1-11A2		18.8	-	8.8	38.8	36.3	25.5	127	0.008	0.002	0.029	0.006
TM-AQ1-9B1		18.8	-	9.4	37.5	37.0	29.3	128	0.007	0.002	0.030	0.006

Table 10.2-6

Summary of selected physicochemical parameters taken on 12 and 26 July 1982 near the IMINE. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TM-AQ1-1A1	12 Jul	26.0	8.4	6.8	4.5	50.0	71.0	206	0.002	0.002	0.013	0.005
TM-AQ1-1A2		26.0	8.7	7.8	7.0	82.5	32.9	214	0.002	0.001	0.014	0.006
TM-AQ1-11A1		26.0	8.7	7.7	6.5	78.0	46.0	226	0.006	0.003	0.014	0.005
TM-AQ1-11A2		26.0	8.4	8.1	6.0	78.5	49.4	222	0.003	0.002	0.012	0.008
TM-AQ1-9B1		26.5	8.6	8.1	8.5	77.5	51.0	213	0.003	0.002	0.012	0.006
TM-AQ1-1A1	26 Jul	27.0	8.7	8.4	5.5	55.5	93.4	239	0.004	0.003	0.013	0.011
TM-AQ1-1A2		27.0	8.6	9.0	10.0	88.0	66.3	234	0.003	0.002	0.013	0.008
TM-AQ1-11A1		27.0	8.6	8.7	11.0	82.0	67.9	263	0.006	0.003	0.018	0.009
TM-AQ1-11A2		27.0	8.7	8.5	13.0	83.5	63.8	249	0.006	0.002	0.020	0.010
TM-AQ1-9B1		27.0	8.8	8.7	10.0	82.5	70.0	258	0.004	0.002	0.014	0.008
MEAN VALUES FOR JULY 1982												
TM-AQ1-1A1	Jul	26.5	-	7.6	5.0	52.8	82.2	220	0.003	0.002	0.013	0.008
TM-AQ1-1A2		26.5	-	8.4	8.5	85.2	49.4	224	0.002	0.002	0.014	0.007
TM-AQ1-11A1		26.5	-	8.2	8.8	80.0	57.0	244	0.006	0.003	0.016	0.007
TM-AQ1-11A2		26.5	-	8.3	9.5	81.0	56.6	236	0.004	0.002	0.016	0.009
TM-AQ1-9B1		26.8	-	8.4	9.2	80.0	60.5	236	0.004	0.002	0.013	0.007

Table 10.1-7

Summary of selected physicochemical parameters taken on 9 and 23 August 1982 near the TRHS. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TR-AQ1-1A1	9 Aug	25.5	8.8	8.3	6.4	66.2	109.0	275	0.004	0.002	0.015	0.008
TR-AQ1-1A2		25.5	8.6	9.5	9.1	103.0	59.7	264	0.003	0.002	0.013	0.008
TR-AQ1-11A1		25.5	8.6	9.7	12.0	92.5	68.7	260	0.006	0.002	0.014	0.008
TR-AQ1-11A2		25.5	8.7	9.4	10.5	92.5	72.0	266	0.005	0.002	0.013	0.008
TR-AQ1-9B1		26.0	8.8	9.8	12.0	83.5	78.2	270	0.005	0.002	0.014	0.009
TR-AQ1-1A1	23 Aug	20.5	8.4	9.8	10.0	67.8	88.9	260	0.003	0.002	0.018	0.007
TR-AQ1-1A2		21.0	8.7	10.8	8.5	84.4	62.6	248	0.002	0.002	0.015	0.008
TR-AQ1-11A1		21.0	8.7	10.3	7.2	76.9	72.8	247	0.002	0.002	0.018	0.008
TR-AQ1-11A2		21.5	8.7	10.0	6.0	74.4	65.0	256	0.003	0.002	0.015	0.007
TR-AQ1-9B1		21.5	8.7	10.7	8.5	76.4	73.3	251	0.003	0.002	0.017	0.009
MEAN VALUES FOR AUGUST 1982												
TR-AQ1-1A1	Aug	23.6	-	9.0	8.2	67.0	84.5	268	0.004	0.002	0.016	0.006
TR-AQ1-1A2		23.2	-	10.2	8.8	93.7	61.2	256	0.003	0.002	0.014	0.008
TR-AQ1-11A1		23.2	-	10.0	9.5	86.7	70.8	254	0.003	0.002	0.016	0.008
TR-AQ1-11A2		23.5	-	9.7	8.2	83.4	68.5	261	0.004	0.002	0.014	0.008
TR-AQ1-9B1		23.8	-	10.2	10.2	80.0	75.8	260	0.004	0.002	0.016	0.009

Table 10.2-8

Summary of selected physicochemical parameters taken on 9 and 20 September 1982 near the TRHS. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TR-AQ1-1A1	9 Sep	19.0	7.7	6.7	6.0	69.0	107.0	307	0.005	0.003	0.009	0.005
TR-AQ1-1A2		19.5	6.0	7.6	10.0	78.0	85.0	288	0.004	0.002	0.010	0.003
TR-AQ1-11A1		19.5	8.1	8.0	8.0	7.0	64.5	101.0	0.005	0.003	0.009	0.003
TR-AQ1-11A2		19.5	8.3	8.2	8.2	65.5	89.0	300	0.004	0.003	0.009	0.007
TR-AQ1-9B1		20.0	5.1	7.8	7.8	9.5	77.0	89.0	0.003	0.002	0.010	0.002
TR-AQ1-1A1	20 Sep	19.0	7.3	7.8	7.6	67.5	124.0	318	0.004	0.002	0.013	0.005
TR-AQ1-1A2		19.0	7.5	10.2	7.0	102.0	70.0	285	0.003	0.002	0.013	0.005
TR-AQ1-11A1		19.5	7.6	8.8	7.5	75.0	105.0	319	0.005	0.003	0.014	0.006
TR-AQ1-11A2		19.5	7.4	9.0	7.1	75.5	114.0	305	0.004	0.003	0.011	0.004
TR-AQ1-9B1		20.0	7.7	9.0	9.0	77.0	110.0	306	0.004	0.002	0.013	0.005
MEAN VALUES FOR SEPTEMBER 1982												
TR-AQ1-1A1	Sep	19.0	-	7.2	6.8	68.2	115.5	312	0.004	0.002	0.011	0.005
TR-AQ1-1A2		19.2	-	8.9	8.5	90.0	77.5	286	0.005	0.002	0.010	0.004
TR-AQ1-11A1		19.5	-	8.4	69.8	7.2	103.0	310	0.005	0.003	0.012	0.006
TR-AQ1-11A2		19.5	-	8.6	70.5	7.3	101.5	302	0.004	0.003	0.010	0.004
TR-AQ1-9B1		20.0	-	8.4	8.7	77.0	99.5	298	0.005	0.002	0.012	0.004

Table 10.2-9

Summary of selected physicochemical parameters taken on 4 and 21 October 1982 near the THINS. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TM-AQ1-1A1	4 Oct	19.0	8.0	8.7	8.5	60.5	121.0	291	0.011	0.003	0.008	0.004
TM-AQ1-1A2		18.5	8.5	11.1	7.1	87.0	60.5	208	0.008	0.002	0.008	0.004
TM-AQ1-11A1		19.0	8.5	10.4	7.4	79.5	71.7	245	0.009	0.003	0.009	0.004
TM-AQ1-11A2		19.0	8.6	10.5	7.9	81.0	75.7	243	0.009	0.003	0.010	0.004
TM-AQ1-9B1		19.0	8.6	11.2	7.6	78.0	76.1	234	0.007	0.003	0.009	0.005
TM-AQ1-1A1	21 Oct	12.0	8.2	8.8	6.8	82.0	82.7	293	0.013	0.003	0.017	0.005
TM-AQ1-1A2		12.0	8.5	10.9	7.0	91.5	57.6	267	0.009	0.002	0.013	0.005
TM-AQ1-11A1		12.0	7.9	10.0	5.6	75.5	96.7	295	0.003	0.003	0.014	0.006
TM-AQ1-11A2		12.0	8.0	9.8	6.0	70.5	100.9	308	0.003	0.003	0.014	0.007
TM-AQ1-9B1		12.0	8.0	10.1	6.0	81.0	79.4	276	0.003	0.003	0.013	0.005
MEAN VALUES FOR OCTOBER 1982												
TM-AQ1-1A1	Oct	15.5	-	8.8	7.7	71.2	101.8	292	0.012	0.003	0.012	0.004
TM-AQ1-1A2		15.2	-	11.0	7.0	89.2	59.0	228	0.008	0.002	0.010	0.004
TM-AQ1-11A1		15.5	-	10.7	6.5	76.5	86.0	270	0.006	0.003	0.012	0.005
TM-AQ1-11A2		15.5	-	10.2	7.0	75.8	87.8	276	0.006	0.003	0.012	0.006
TM-AQ1-9B1		15.5	-	10.6	6.8	79.5	77.8	255	0.005	0.003	0.011	0.005

Table 10.2-10

Summary of selected physicochemical parameters taken on 1 and 15 November 1982 near the THINS. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Zinc	Dissolved Zinc
TM-AQ1-1A1	1 Nov	13.0	7.8	9.5	2.9	72.6	106.0	281	0.020	0.002	0.013	0.004
TM-AQ1-1A2		12.5	8.3	11.9	2.9	91.0	51.4	189	0.016	0.002	0.009	0.003
TM-AQ1-11A1		13.0	8.1	11.0	2.7	81.1	79.0	242	0.014	0.002	0.008	0.004
TM-AQ1-11A2		13.0	8.2	10.8	2.7	78.6	86.8	257	0.011	0.002	0.016	0.013
TM-AQ1-9B1		13.0	8.4	12.4	2.5	80.6	78.6	239	0.013	0.002	0.008	0.004
TM-AQ1-1A1	15 Nov	6.0	7.1	10.5	19.0	56.0	36.6	163	0.010	0.003	0.017	0.011
TM-AQ1-1A2		6.0	7.2	10.2	32.5	54.0	22.6	155	0.008	0.003	0.026	0.012
TM-AQ1-11A1		6.0	7.1	10.4	27.5	56.0	30.9	167	0.008	0.003	0.021	0.011
TM-AQ1-11A2		6.0	7.2	10.4	33.0	55.5	31.3	168	0.010	0.003	0.024	0.010
TM-AQ1-9B1		6.0	7.1	10.5	29.0	55.0	31.7	164	0.006	0.003	0.017	0.009
MEAN VALUES FOR NOVEMBER 1982												
TM-AQ1-1A1	Nov	9.5	-	10.0	11.0	66.3	71.3	222	0.015	0.002	0.014	0.008
TM-AQ1-1A2		9.2	-	11.0	17.7	72.5	37.0	172	0.012	0.002	0.016	0.008
TM-AQ1-11A1		9.5	-	10.7	15.1	68.6	55.0	206	0.011	0.002	0.014	0.008
TM-AQ1-11A2		9.5	-	10.6	17.8	67.0	59.0	212	0.010	0.002	0.020	0.012
TM-AQ1-9B1		9.5	-	11.4	15.8	67.8	55.2	202	0.008	0.002	0.012	0.006

Table 10, 2-11

Summary of water and physicochemical parameters taken on 2 and 16 December 1982 near the INDS. Values are expressed in mg/l except for water temperature (C), pH, and conductivity (DS).

Location	Date	Water Temperature (C)	pH	Dissolved Oxygen	Turbidity (NTU)	Alkalinity as CaCO ₃	Sulfate	Total Dissolved Solids	Total Copper	Dissolved Copper	Total Time	Class-lead Time
TS-001-1A1	2 Dec	4.5	8.3	11.2	7.3	42.5	53.9	171	0.004	0.002	6.011	0.508
TS-001-1A2		6.5	8.1	10.8	8.0	48.0	35.8	148	0.004	0.002	6.011	0.005
TS-001-11A1		7.0	8.3	11.6	9.5	47.0	37.0	152	0.006	0.003	6.013	0.012
TS-001-11A2		7.0	8.2	11.3	8.0	47.5	37.2	153	0.007	0.002	6.014	0.005
TS-001-0B1		7.0	8.2	11.2	9.0	46.0	36.6	145	0.019	0.003	6.012	0.008
TS-001-1A1	16 Dec	4.0	8.0	12.7	6.6	48.3	53.6	179	0.006	0.002	6.012	0.012
TS-001-1A2		2.5	8.5	13.0	4.8	46.0	41.2	176	0.293	0.002	6.015	0.009
TS-001-11/1		3.0	8.5	13.2	7.0	41.6	38.7	173	0.001	0.001	6.014	0.023
TS-001-11A2		3.0	8.5	13.4	2.3	42.1	44.2	177	0.006	0.001	6.014	0.009
TS-001-0B1		3.5	8.5	13.2	4.5	59.1	42.8	169	0.003	0.012	6.013	0.007
SEAB VALUES FOR DECEMBER 1982												
TS-001-1A1	16 Dec	2.2	-	12.0	7.0	45.4	56.8	175	0.005	0.002	6.010	0.014
TS-001-1A2		4.5	-	13.9	6.9	56.0	38.5	162	0.006	0.002	6.012	0.007
TS-001-11A1		5.0	-	12.3	5.8	54.3	37.8	162	0.004	0.002	6.014	0.008
TS-001-11A2		5.0	-	12.4	5.0	54.8	39.1	164	0.006	0.012	6.017	0.007
TS-001-0B1		5.2	-	12.1	6.8	52.6	39.7	157	0.011	0.002	6.014	0.008

Table 10.2-12

Monthly mean, minimum, and maximum concentrations of selected water quality parameters taken near the INHS in 1982. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU). No data collected in February due to ice cover.

Month	Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Water Temperature (C)	Mean	1.1		3.2	8.8	16.0	18.7	26.6	23.4	19.5	15.4	9.8	5.0
	Min	1.0		0.0	5.5	16.0	17.0	26.0	20.5	15.0	11.0	6.0	2.5
	Max	1.5		5.5	12.0	16.0	20.5	27.0	26.0	20.0	19.0	13.0	7.0
pH	Mean												
	Min	7.9		8.1	8.4	8.6	8.0	8.4	8.4	7.3	7.9	7.1	8.1
	Max	8.2		8.5	9.4	9.7	9.1	8.8	8.8	8.1	8.6	8.4	9.0
Dissolved Oxygen	Mean	13.4		12.4	10.6	8.9	9.1	8.2	9.8	8.3	10.2	11.8	12.1
	Min	13.2		12.0	9.6	7.8	8.6	6.8	8.3	6.7	8.7	9.5	10.8
	Max	13.6		12.8	11.6	9.9	10.2	9.0	10.8	10.2	11.2	12.4	13.4
Turbidity (NTU)	Mean	21.6		22.7	10.5	6.0	18.0	8.2	9.0	7.7	7.0	15.5	5.9
	Min	20.0		16.0	6.0	3.9	10.0	4.5	6.0	6.0	5.6	2.5	1.8
	Max	25.0		33.0	14.5	12.0	65.0	13.0	12.0	10.0	8.6	33.0	9.5
Alkalinity	Mean	28.4		34.2	27.5	55.9	36.2	75.8	81.8	75.1	79.4	68.0	52.6
	Min	26.8		23.1	26.1	35.9	26.1	50.0	66.2	64.5	60.5	54.0	42.5
	Max	29.3		45.2	28.3	69.4	46.5	88.0	103.0	102.0	91.5	91.0	64.0
Sulfate	Mean	35.1		31.0	40.4	46.2	29.7	61.2	74.1	99.4	82.1	55.5	42.0
	Min	26.3		16.5	23.5	22.2	23.0	32.9	59.7	70.0	57.6	22.6	35.4
	Max	39.9		40.7	52.7	78.2	35.0	93.4	100.0	124.0	121.0	106.0	55.6
Total Dissolved Solids	Mean	140		133	130	176	128	232	260	302	264	292	164
	Min	138		87	117	155	107	200	247	284	208	175	145
	Max	146		182	142	191	150	263	275	379	308	281	179
Total Copper	Mean	0.012		0.004	0.003	0.004	0.007	0.006	0.003	0.004	0.008	0.011	0.006
	Min	0.009		0.002	0.002	0.002	0.003	0.002	0.002	0.003	0.003	0.006	0.002
	Max	0.015		0.006	0.004	0.006	0.011	0.006	0.005	0.005	0.013	0.020	0.019
Dissolved Copper	Mean	0.002		0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002
	Min	0.001		0.001	0.001	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.002
	Max	0.002		0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002
Total Zinc	Mean	0.039		0.024	0.026	0.018	0.032	0.014	0.015	0.011	0.012	0.015	0.014
	Min	0.030		0.016	0.019	0.011	0.017	0.012	0.013	0.009	0.008	0.008	0.011
	Max	0.062		0.036	0.035	0.029	0.048	0.020	0.018	0.014	0.017	0.024	0.027
Dissolved Zinc	Mean	0.012		0.008	0.015	0.007	0.005	0.008	0.008	0.004	0.005	0.008	0.009
	Min	0.010		0.003	0.012	0.001	0.003	0.005	0.006	0.002	0.004	0.003	0.005
	Max	0.016		0.013	0.018	0.014	0.008	0.011	0.009	0.007	0.007	0.013	0.024

Table 10.2-16

Results of the two factor analysis of variance test for station and yearly means for alkalinity, sulfate, total dissolved solids, total and dissolved copper, and total zinc collected at the macroinvertebrate stations, 1978 through 1982.

Alkalinity	Source of Variation	df	SS	MS	F
	Subgroups	24	38461.983	1602.583	
	Stations	4	11149.319	2787.330	6.530*
	Years	4	26118.010	6529.502	15.298*
	Interaction	16	1194.654	74.666	0.175
	Error	400	170728.980	426.822	
	Total	424	209190.963		
Sulfate	Source of Variation	df	SS	MS	F
	Subgroups	24	54115.651	2254.819	
	Stations	4	21671.831	5417.958	7.622*
	Years	4	30645.855	7661.464	10.777*
	Interaction	16	1797.965	112.373	0.158
	Error	400	284352.681	710.882	
	Total	424	338468.333		
Total Dissolved Solids	Source of Variation	df	SS	MS	F
	Subgroups	24	200698.809	8362.367	
	Stations	4	6455.398	1613.849	0.397
	Years	4	186871.868	46717.967	11.480*
	Interaction	16	7369.544	460.596	0.113
	Error	400	1627780.000	4069.450	
	Total	424	1828476.809		
Total Copper	Source of Variation	df	SS	MS	F
	Subgroups	24	0.000868	0.000036	
	Stations	4	0.000018	0.000004	0.450
	Years	4	0.000808	0.000202	20.501*
	Interaction	16	0.000042	0.000003	0.266
	Error	400	0.003942	0.000010	
	Total	424	0.004810		
Dissolved Copper	Source of Variation	df	SS	MS	F
	Subgroups	24	0.000052	0.000002	
	Stations	4	0.000005	0.000001	0.524
	Years	4	0.000035	0.000009	3.826*
	Interaction	16	0.000012	0.000001	0.343
	Error	400	0.000910	0.000002	
	Total	424	0.000962		
Total Zinc	Source of Variation	df	SS	MS	F
	Subgroups	24	0.002109	0.000088	
	Stations	4	0.000451	0.000113	1.404
	Years	4	0.001020	0.000255	3.179*
	Interaction	16	0.000638	0.000040	0.497
	Error	400	0.032100	0.000080	
	Total	424	0.034209		

* Significant at $P \leq 0.05$.

Table 10.2-17

Results of the Student-Newman-Keuls multirange test on values of alkalinity and sulfate determined at the macroinvertebrate stations, 1978 through 1982. Stations underscored were not significantly different ($P \leq 0.05$). Station means were ranked from lowest to highest.

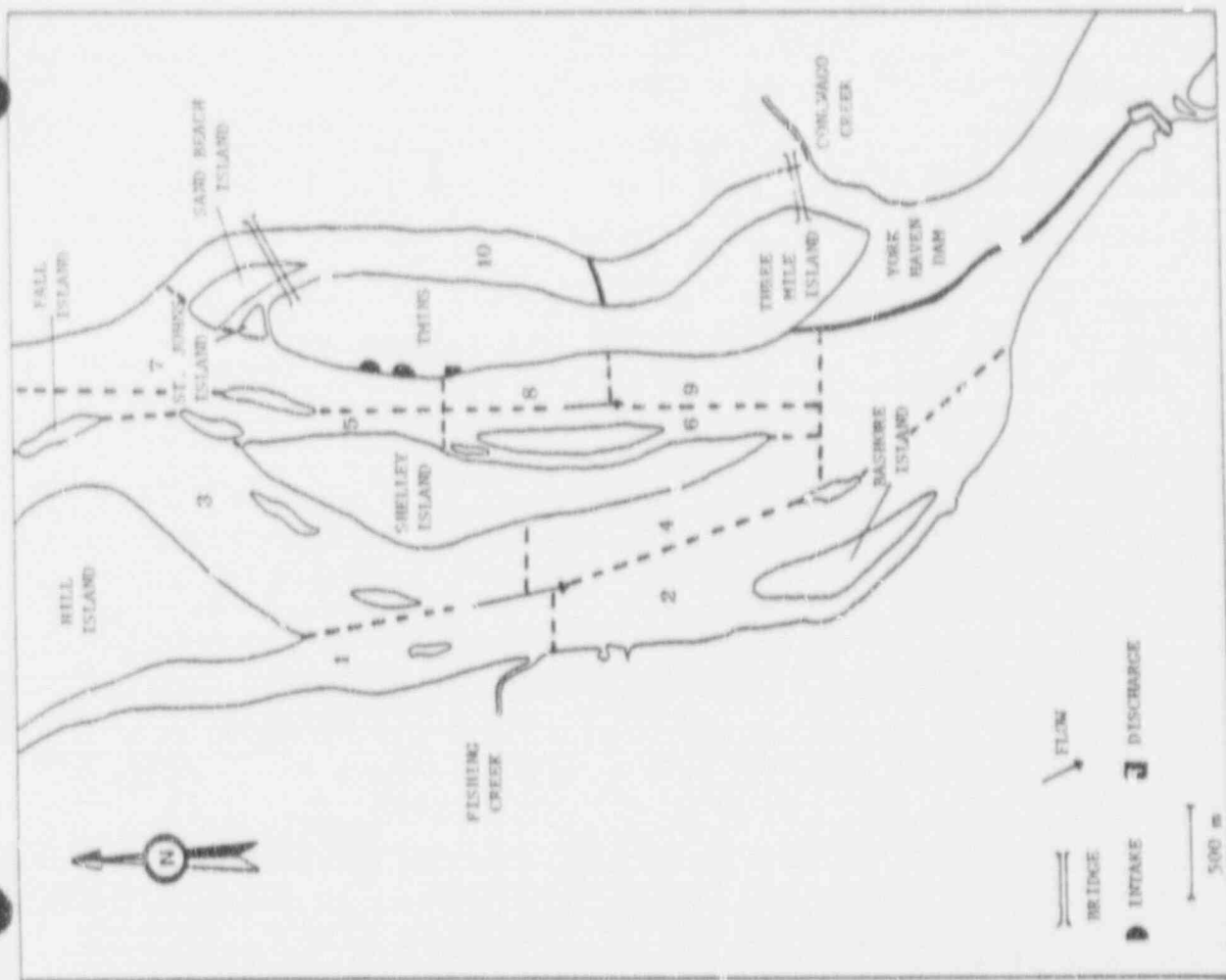
Alkalinity					
Station	1A1*	9B1	11A1	11A2	1A2
Mean	46.099	55.616	57.225	57.294	61.549
Sulfate					
Station	1A2	11A2	11A1	9B1	1A1
Mean	52.639	61.172	62.061	62.311	74.984

* Prefix (M-AQI) deleted from table.

Table 10.2-18

Results of the Student-Newman-Keuls multirange test on values of alkalinity, sulfate, total dissolved solids, total and dissolved copper, and total zinc determined at the macroinvertebrate stations, 1978 through 1982. Years underscored were not significantly different ($P \leq 0.05$). Year means were ranked from lowest to highest.

Alkalinity					
Year	1979	1981	1978	1982	1980
Mean	45.376	50.384	53.329	61.400	67.294
Sulfate					
Year	1981	1979	1978	1982	1980
Mean	55.329	58.918	59.800	59.845	79.294
Total Dissolved Solids					
Year	1979	1981	1978	1982	1980
Mean	175.835	181.741	182.094	208.400	231.235
Total Copper					
Year	1979	1980	1982	1981	1978
Mean	0.0050	0.0054	0.0056	0.0060	0.0089
Dissolved Copper					
Year	1982	1980	1979	1978	1981
Mean	0.0022	0.0027	0.0028	0.0029	0.0030
Total Zinc					
Year	1981	1980	1982	1979	1978
Mean	0.0167	0.0172	0.0175	0.0201	0.0203



ZONE 8	
29	TM-AQF-11A2
30	TM-AQ1-11A1
31	TM-LF-11A1
32	TM-AQ1-11A2
33	TM-AQF-10A2
34	TM-AQF-10A3
35	TM-AQF-11A3

ZONE 9	
36	TM-AQF-9B6
37	TM-AQF-9A1
38	TM-AQF-9B5
39	TM-LF-9B1
40	TM-AQF-9B3
41	TM-AQ1-9B1
42	TM-AQF-9B2

ZONE 10	
43	TM-AQF-6A1
44	TM-LF-6A1
45	TM-AQF-6A2

ZONE 1	
1	TM-LF-14B1
2	TM-AQF-15B2
3	TM-AQF-13B5
4	TM-LF-12B1

ZONE 2	
5	TM-AQF-11B1
6	TM-LF-10B1
7	TM-AQF-10B5

ZONE 3	
8	TM-LF-15B1
9	TM-AQF-16B8
10	TM-AQF-16A5
11	TM-AQF-15A1

ZONE 4	
12	TM-LF-12A1
13	TM-LF-10B2
14	TM-AQF-10B3

ZONE 5	
15	TM-AQF-15A2
16	TM-LF-13A1

ZONE 6	
17	TM-AQF-10B1
18	TM-LF-10B3

ZONE 7	
19	TM-LF-1B1
20	TM-AQ1-1A1
21	TM-AQF-1A2
22	TM-AQF-1A3
23	TM-AQ1-1A2
24	TM-AQF-16A1
25	TM-LF-16A1
26	TM-LF-13A2
27	TM-AQF-13A1
28	TM-AQF-16A2

Figure 10.1-1. Location of zones in York Haven Pond where water temperature, dissolved oxygen, and pH were taken in 1982.

11.0 THERMAL PLUME MAPPING

The TMINS discharge plume was monitored to characterize the water of the Susquehanna River with respect to temperature and the area of the plume, and to compare field results with the analytical plume model.

11.1 METHODS

Scheduled mapping of the heated effluent occurs once annually during the scheduled shutdowns of TMINS Units 1 and 2 and once during the summer low river flow (<10,000 cfs; 283.2 m³/s) between June and September.

Vertical temperature profiles were taken from surface to bottom at 0.5 m intervals with an ENDECO Digital Thermometer. The thermistor probe was attached to one end of a 3 m pole to allow consistent vertical measurements. Vertical profiles were taken at 5 m, 20 m, and 40 m from the west shore of TMI.

Control (ambient river temperature) transects were established at the Unit 1 Intake Building and 25 m upstream of the Discharge. Indicator transects were established at the Discharge and 25 m, 50 m, 75 m, 125 m, 150 m, 200 m, 300 m, 400 m, 800 m, 1000 m, and 1900 m downstream of the Discharge. Permanent markers were placed on shore at each designated transect. Station operation level, effluent flow rate, intake and discharge water temperature, and the number of river water pumps in use (nuclear and secondary service, and decay heat) were obtained from the TMINS Control Rooms before and after each plume mapping. River flow (cfs) for 0700 hours on the date of each mapping was obtained

from the River Forecast Center in Harrisburg, Pennsylvania. The river elevation (m) was taken from markings on the south wingwall of the Unit 1 Intake Building. Air temperature, dew point, and wind speed and direction were obtained from Pickard, Lowe, and Garrick, Inc. (Washington, D.C.) who monitor these data at TMINS for General Public Utilities Nuclear Corporation.

The heated effluent area was defined by criteria established in Appendix B of the Environmental Technical Specifications for Units 1 and 2 which states, "During the period between 1 April and 30 September the discharge temperature shall be no greater than 7 F [3.9 C] above or 3 F [1.7 C] below the inlet temperature. If the intake water temperature is 87 F [30.6 C] or higher the discharge temperature shall be maintained at or below ambient river temperature. During the period between 1 October and 31 March the discharge temperature shall be no greater than 12 F [6.7 C] above or 3 F [1.7 C] below the inlet temperature."

11.2 RESULTS

The continued shutdown of TMINS Units 1 and 2 throughout 1982 (resulting from the clean-up associated with the 28 March 1979 accident at Unit 2) made refueling outages unnecessary; no corresponding plume mappings were conducted. On 6 August and 29 September, during the summer low river flow period (240.7 m³/s and 216.9 m³/s, respectively), the TMINS effluent was mapped; results are presented in Tables 11.2-1 and 11.2-2. No increase in river temperature below the discharge outlet was discernible on either sample date. However, data collected

along the transects did exhibit horizontal and vertical temperature differences ranging from 0.1 to 1.0 C. These variations were attributed to solar warming of the shallower, calmer, water near the shore.

The discharge flow rate comprised a very small percentage of the total river flow (0.7% on 6 August and 0.6% on 29 September). The expanse of the Susquehanna River near the Discharge (about 460 m in width and 2 m in depth) coupled with the river flow limited the horizontal and vertical spreading of the plume to the point of discharge. Thus the effluent was quickly dispersed within a few meters of the discharge outlet.

In general, any impact the discharge temperature might have had on the surrounding aquatic communities was indeterminate. Temperature fluctuations within York Haven Pond vary daily depending upon time, season, depth, solar heating, and river flow.

11.3 DISCUSSION

The criteria established for the heated effluent were not exceeded on 6 August or 29 September 1982.

The analytical plume model described in the Final Environmental Statement was related to operation of Three Mile Island Nuclear Station (Atomic Energy Commission 1972b) for normal cooling tower effluent. No comparison with the analytical plume model was made based upon 1982 data, since the Station was not operating and the ΔT 's were below those used in the model. The ΔT 's from 1982 were within the April through September ranges (0.9 below to 2.8 C above ambient) reported since 1975.

Table 11.2-1

Thermal plume temperature data (C) taken at 0.5 m intervals surface (S) to bottom at 5 m, 20 m, and 40 m offshore, above and below the DMINE Discharge, 6 August 1982.

		Air Temp (C): 24.9		Dew Point (C): 18.4	
		Wind Speed (km/h): 8.3		Wind Direction: 71°	
		River Flow (m ³ /s): 240.7		River Elevation (m): 84.7	
Time:	Start	Finish	Secondary Service Pumps:		
Station Operation Level (S):	1038	1227	Unit 1	1	1
Unit 1	0	0	Unit 2	1	1
Unit 2	0	0	Decay Heat Pumps:		
Nuclear Service Pumps:			Unit 1	0	0
Unit 1	1	1	Effluent Rate (m ³ /s):	1.56	1.70
Unit 2	1	1	Intake Temp (C):	25.9	27.4
			Affluent Temp (C):	26.5	27.6
Distance From Three Mile Island Shore			Distance From Three Mile Island Shore		
40 m	20 m	5 m	40 m	20 m	5 m
		Depth			Depth
26.5	26.6	25.7 S	26.2	26.1	26.0 S
26.5	26.6	25.6 0.5 m	26.1	26.1	26.0 0.5
26.5	26.5	25.6 1.0	26.1	26.1	26.0 1.0
26.5	26.5	25.6 1.5	26.1		26.0 1.5
		25.6 2.0			
			26.1	25.8	25.9 S
26.3	26.2	26.3 S	26.1	25.8	25.8 0.5
26.3	26.2	26.3 0.5	26.0	25.8	25.8 1.0
26.3	26.2	26.2 1.0		25.8	25.8 1.5
26.3		26.2 1.5			
26.3		26.2 2.0	26.3	26.0	25.9 S
			26.3	26.0	25.8 0.5
26.3	26.2	26.2 S	26.3	25.9	25.9 1.0
26.3	26.2	26.2 0.5	26.2	25.9	25.9 1.5
26.2	26.2	26.2 1.0	26.2	25.9	25.9 2.0
26.2		26.2 1.5			
			26.3	25.8	25.9 S
25.8	26.1	26.3 S	26.3	25.8	25.9 0.5
25.8	26.1	26.3 0.5	26.3	25.8	25.8 1.0
25.8	26.1	26.2 1.0	26.3	25.8	25.8 1.5
25.8	26.1	26.2 1.5	26.2		25.8 2.0
25.8	25.8	25.9 S	26.5	26.3	26.4 S
25.8	25.8	25.8 0.5	26.5	26.3	26.4 0.5
25.8	25.8	25.8 1.0	26.5	26.3	26.4 1.0
25.8	25.8	25.8 1.5	26.4	26.2	26.4 1.5
			26.3		26.3 2.0
25.9	25.8	25.8 S			
25.9	25.8	25.8 0.5	26.5	26.3	26.1 S
25.9	25.8	25.8 1.0	26.5	26.3	26.1 0.5
25.9	25.8	25.8 1.5	26.5	26.3	26.1 1.0
			26.5	26.3	26.1 1.5
26.0	25.9	25.9 S			
26.0	25.9	25.9 0.5	26.7	26.7	26.8 S
26.0	25.9	25.9 1.0	26.7	26.7	26.7 0.5
26.0	25.9	25.9 1.5	26.7	26.7	26.7 1.0
			26.7	26.6	26.7 1.5
26.1	26.0	26.0 S	26.7		26.6 2.0
26.1	26.0	26.0 0.5			
26.1	26.0	26.0 1.0			
26.1		26.0 1.5			

Table 11.2*2

Thermal plume temperature data (C) taken at 0.5 m intervals surface (S) to bottom at 5 m, 20 m, and 40 m offshore, above and below the TMINS Discharge, 29 September 1982.

		Air Temp (C): 21.3		Dew Point (C): 12.8	
		Wind Speed (km/h): 9.6		Wind Direction: 39°	
		River Flow (m ³ /s): 216.9		River Elevation (m): 84.5	
Time:	Start	Finish	Secondary Service Pumps:		
Station Operation Level (S):	1409	1531	Unit 1	Start	Finish
Unit 1	0	0	Unit 2	1	1
Unit 2	0	0	Decay Heat Pumps:		
Nuclear Service Pumps:			Unit 1	0	0
Unit 1	1	1	Effluent Rate (m ³ /s):	1.26	1.26
Unit 2	1	1	Intake Temp (C):	17.7	18.4
			Effluent Temp (C):	17.6	18.2
Distance From Three Mile Island Shore			Distance From Three Mile Island Shore		
40 m	20 m	5 m	40 m	20 m	5 m
		Depth			Depth
18.2	17.7	8	17.7	17.7	8
18.2	17.7	0.5 m	17.7	17.9	0.5
18.2	17.7	1.0	17.7	17.9	1.0
	17.7	1.5		17.9	1.5
		2.0			
		2.5	17.7	17.8	2.0
		3.0	17.7	17.8	2.5
			17.7	17.8	3.0
17.7	17.6	8	17.7	17.8	8
17.7	17.6	0.5	18.1	17.7	0.5
17.7	17.6	1.0	18.1	17.7	1.0
17.7		1.5	18.1	17.7	1.5
17.7		2.0	18.1	17.7	2.0
			18.0		
17.7	17.7	8	17.8	17.8	8
17.7	17.7	0.5	17.8	17.8	0.5
17.7	17.7	1.0	17.8	17.8	1.0
17.7		1.5	17.8	17.7	1.5
			17.8	17.7	
17.6	17.7	8	17.8	17.8	8
17.6	17.6	0.5	17.8	17.8	0.5
17.6	17.6	1.0	17.8	17.8	1.0
17.6		1.5	17.8	17.7	1.5
			17.8	17.7	
17.6	17.6	8	18.2	18.1	8
17.6	17.6	0.5	18.2	18.1	0.5
17.6	17.6	1.0	18.1	18.0	1.0
17.6	17.6	1.5	18.0	17.9	1.5
			17.9		2.0
17.7	17.6	8	18.0	17.9	8
17.7	17.6	0.5	18.0	17.9	0.5
17.7	17.6	1.0	18.0	17.9	1.0
17.7	17.6	1.5	17.9	17.8	1.5
17.8	17.7	8	18.1	18.0	8
17.8	17.7	0.5	18.0	18.0	0.5
17.8	17.7	1.0	17.9	18.0	1.0
17.7	17.7	1.5	17.9	17.9	1.5
			17.8	17.7	2.0
17.7	17.8	8			
17.7	17.8	0.5			
17.7	17.8	1.0			
17.7	17.8	1.5			

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