NIAGARA MOHAWK POWER CORPORATION

POWER AUTHORITY OF THE STATE OF NEW YORK

TEXAS INSTRUMENTS
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Science Services Division

30 June 1978

Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Attention: Mr. William C. Hiestand
Environmental Projects Manager

Subject: Errata for the Nine Mile Point Aquatic Ecology Studies
1977 Data Report and Interpretive Report

Enclosure: Errata for the Nine Mile Point Reports

Dear Mr. Hiestand:

As per discussions with Cheryl Blum we have modified macrozooplankton tables and expressed densities in number per 1000 cubic meters, and have submitted the other errata accumulated for the 1977 Data and Interpretive Reports.

These modifications and errata do not impact the study results nor change any conclusions presented within the summary section or main body of the reports.

Yours very truly,

TEXAS INSTRUMENTS INCORPORATED

Richard Moos (by FB)

Richard Moos
Program Manager
Ecological Services

RM:ah

Enclosures

ERRATA

1977 NINE MILE POINT AQUATIC ECOLOGY STUDIES

SECTION IV and APPENDIX B

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Percent relative abundance of calanoid copepods during April, May, July and November was 68, 88, 13, and 20 percent respectively.

Tables IV-B 3 and 4 and Appendix Tables B-7 and B-8.

The macrozooplankton tables have been modified and densities expressed as number of organisms per 1000 cubic meters so they are directly comparable to previous reports; new tables attached.

APPENDIX G

Table G-3.

Change unit of measure for chlorophyll _a_ and phaeophytin _a_ to µg/ℓ.

SECTION IV

Table IV-C 3 and IV-C 6. Change title to read, "Ash-Free Dry Weight (Milligrams/Square Decimeter) of ________".

1977
NINE MILE POINT AQUATIC ECOLOGY STUDIES

Prepared for

NIAGARA MOHAWK POWER CORPORATION
Syracuse, N.Y.
and
POWER AUTHORITY OF THE STATE OF NEW YORK
New York, N.Y.

Prepared by

TEXAS INSTRUMENTS INCORPORATED
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May 1978

FOREWORD

This 1977 Annual Report presents the results of aquatic ecology studies conducted in the vicinity of Nine Mile Point on Lake Ontario (Oswego County, New York) during 1977. Nine Mile Point is the site of the 610 MWe Nine Mile Point Unit I and 821 MWe James A. FitzPatrick nuclear power stations. The studies were conducted by Niagara Mohawk Power Corporation (NMPC) and the Power Authority of the State of New York (PASNY) and represent a continuation of ecological studies that were initiated as the stations were being constructed (Nine Mile Point began producing power in 1969; FitzPatrick in 1975). The sampling program included surveys in Lake Ontario in the vicinity of the Nine Mile Point promontory from April through December and impingement and entrainment studies at both power stations during the entire year. The ecological studies were conducted in accordance with the Environmental Technical Specifications prepared by the U.S. Nuclear Regulatory Commission.

The objective of this report is to summarize the results of the 1977 program, presenting the current status of the major biotic components in Lake Ontario including phytoplankton, zooplankton, periphyton, benthic invertebrates, and fish (including eggs and larvae). Emphasis in this report is placed on descriptions of the composition of each biotic component and the distribution of these biotic groups with respect to time and space. Comparisons are made among samples from the discharge plume areas, from areas of the lake that are outside the immediate influence of the discharges, and from within the plants. Conclusions are presented regarding the effects of power plant operation on the temporal and spatial distribution of the biota and on water quality in the area.

The data base for the 1977 studies has been presented previously in tabulated form (1977 Data Report, Texas Instruments Incorporated 1978), and provides supportive information for this report.

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SECTION I

SUMMARY

A. SUMMARY OF LAKE ONTARIO STUDIES

1. Phytoplankton

Of the 235 phytoplankton taxa collected during the 1977 study in the vicinity of Nine Mile Point, 70 percent were either green algae or diatoms. Only 59 of the taxa represented 2 percent or more of the relative abundance during any one sampling period. Diatoms dominated the phytoplankton community during the colder months (April, May, November, and December), but green algae were dominant in summer (July and August). Blue-greens were most abundant during early summer and fall, and phytoflagellates were abundant during April, July, and December.

Total phytoplankton cell densities exhibited peaks in May and July. Cell densities gradually decreased during late summer and fall, reaching a low in December.

No spatial trends were observed for total or major group cell densities with respect to stations, depth contours, or control and experimental areas in the vicinity of the power stations. Significant differences in spatial distribution are generally prevented by wind-induced turbulence.

The temporal distribution of chlorophyll a concentrations resembled temporal trends previously described for cell densities. Chlorophyll a concentrations were slightly higher at the experimental transects than at the control transects, and a slight decrease in concentrations was observed from the 10-foot outward to the 60-foot depth contour.

Primary production rates were highest in May and lowest during July, but exhibited no consistent trends with phytoplankton densities or chlorophyll a concentrations. The decrease of primary production rates from the 10-foot to the 60-foot contour was similar to the chlorophyll a results. Rates of primary production were quite variable during the 1977 study and did not appear to be influenced by power plant operations.

Overall, the 1977 phytoplankton study revealed no appreciable influence by power plant operations on the number of taxa, temporal or spatial distribution, chlorophyll a concentrations, or primary production in the Nine Mile Point vicinity.

2. Microzooplankton

The microzooplankton community in the vicnity of Nine Mile Point during 1977 was composed of 47 taxa; Rotifera were dominant, accounting for 74 percent of the microzooplankton community. The seasonal pattern of microzooplankton abundance was essentially unimodal, the peak occurring in June. No salient differences in total microzooplankton density were observed between individual transects or experimental and control areas. The only depth-related distribution pattern occurred during May, June, and July when total density decreased as depth increased.

Temporal and spatial distribtuion patterns generally reflected natural variations rather than effects of the operation of the power stations.

3. Macrozooplankton

Cladocerans dominated the 35 taxa of macrozooplankton collected during 1977 in the vicinity of Nine Mile Point. Such selected species as the scuds, Gammarus fasciatus and Pontoporeia affinis and mysid shrimp, Mysis oculata relicta, were rare or absent in macrozooplankton collections. The seasonal distribution pattern in total abundance was essentially trimodal; a major peak occurred in August and secondary peaks occurred in May and November.

Higher densities of macrozooplankton were found at stations on the 60, 80 or 100-foot depth contours most of the year. No apparent trends in density differences were observed between the stations near the thermal discharges and those stations farthest from the plume. Differences observed in community composition and spatial and temporal distribution of macrozooplankton were attributable to natural variation.

4. Periphyton

Bottom and suspended periphyton exhibited distribution and species composition patterns similar to macrozooplankton. Higher numbers and biomass were present

in the spring and in mid-summer. Green and blue-green algae and diatoms were most common, with green algae having the greatest number of taxa, while Lyngbya sp., a filamentous blue-green, was the most abundant alga encountered.

Bottom and suspended artificial substrate samples indicated that periphyton abundance and biomass decreased with distance from shore. During the summer suspended periphyton biomass and density were much larger in the control area than in the experimental area. Thermal effluents from the power stations appeared to suppress growth of periphyton on suspended substrates near the discharges, but most periphyton in the area grows on bottom substrates and no stimulation or repression of the bottom periphyton community by the power station discharges was determined.

5. Benthic Invertebrates

Fifty-nine taxa were collected during the 1977 benthic study. Amphipoda was the numerically dominant taxa and biomass was dominated by freshwater clams and amphipods. Gammarus fasciatus and Pontoporeia affinis were the dominant amphipods. Seasonal density and biomass were characterized by considerable monthly variations; a single peak occurred in September.

The species composition and spatial or temporal distribution of benthic macroinvertebrates in the Nine Mile Point vicinity apparently was not influenced by the thermal discharge of the James A. FitzPatrick and/or Nine Mile Point power plants.

6. Ichthyoplankton

Fish eggs of five taxa were collected in the vicinity of Nine Mile Point from early May through July; Alewife eggs dominated the collections. Peak densities for this species were observed in mid-July and were consistently more abundant during night sampling. No consistent trend was observed in egg distribution at stations along the 20- or 40-foot depth contours, suggesting no apparent influence from thermal discharges of the two power stations.

Larvae of 22 taxa were collected from April through November; Alewife dominated larval catches. Highest densities were observed during July and August but three minor peaks in larval densities were observed prior to July. The first

peak was due primarily to an increase in the early-spawning burbot in late April. Peaks in May and June were the result of increasing densities of yellow perch and rainbow smelt. After the summer peak the number of larvae decreased rapidly during late August and densities were low after mid-September.

Larval densities were highest at night. Densities of younger larvae generally decreased with increasing depth from the 20- out to the 100-foot depth contour, and densities of older larvae were highest along the 20-foot contour and lower but relatively equal at the deeper contours. A similar onshore-offshore distribution was observed in previous years at Nine Mile Point. Prolarvae distribution along the 20- and 40-foot depth contours indicated that higher densities occurred at stations adjacent to the plant discharges. However, since prolarvae are planktonic, their active concentration in the area was unlikely. Postlarvae exhibited no distributional trend with respect to the thermal plumes from the two power stations.

The species composition and temporal and spatial distribution patterns observed suggests that operation of the two power stations had no detrimental effect on fish eggs and larvae in the area.

7. Fish

Thirty-seven species were collected by gill net, trawl, beach seine, and box trap in the Nine Mile Point vicnity during the study. The fish community was diverse; 14 species were present in the area during every month of sampling and 10 other species occurred during at least half of the months. Alewife was the dominant species collected by each gear except box trap.

Temporal distribution varied according to the gear used. Gill net catches were highest in May, July, and October; catches were significantly higher at night than during the day. Alewife, rainbow smelt, spottail shiner, white perch, and yellow perch dominated gill net catches. Trawl catches were highest during April, August, and September; and night catches were usually higher than day catches. Alewife and rainbow smelt dominated trawl catches. Beach seine catches increased from April through August but decreased through November. Alewife and white perch usually dominated beach seine catches, but spottail shiner comprised more than half the fish caught in June.

The temporal distribution patterns observed were similar to typical patterns for fish populations in eastern Lake Ontario. High catches occurred during spring and the first part of summer while catches were low during mid-summer. Secondary peaks in abundance occurred during late summer and fall when young-of-the-year fish grew to a catchable size.

Spatial distribution according to gill net catches indicated that fish were most abundant along the 15-foot contour and least abundant along the 60-foot contour. Catches along the 15-foot depth contour were usually lowest at the westernmost station (NMPW). Catches along the 30- and 40-foot contours appeared to be equally distributed among the four stations during several months, but on some occasions tended to be higher at the two eastern stations (FITZ and NMPE). Catches along the 60-foot contour were variable. Overall, spatial distribution of gill-netted fish showed no consistent trends with respect to the experimental and control areas.

Trawl catches during April, when adult fish were relatively abundant, were similar at control and experimental stations. August and September trawling caught primarily young-of-the-year alewife, and collections indicated some preference for the warmer discharge waters.

Beach seine catches were highest at experimental station NMPP. This spatial distribtuion was apparently related to physical habitat differences rather than plant effects since the shorezone area was probably not affected by warm water discharges.

8. Water Quality

The seasonal thermal cycle in the vicinity of Nine Mile Point was not disrupted by discharges from either the Nine Mile Point or James a. FitzPatrick power stations during 1977. Short-term surface and bottom temperature variations were most likely the result of variations in meteorological conditions and cold water intrusions respectively. No mean annual temperature differences were found among transects at any of the contour sampling locations.

Operation of the power plants had no discernible effect on water quality in the vicinity of Nine Mile Point. High suspended solids were most probably the result of discharge from the Oswego River and increased water turbulence caused by high northwesterly winds.

B. SUMMARY OF IMPINGEMENT AND ENTRAINMENT STUDIES

1. Impingement - Nine Mile Point

Forty-six species were identified from impingement samples collected at the Nine Mile Point plant during 1977. Estimated impingement during 1977 was nearly 135,000 fish, weighing approximately 2900 kilograms. Numerically, alewife or rainbow smelt dominated catches during each month. In terms of biomass however, alewife, gizzard shad, burbot, or rock bass were dominant.

Impingement rates were highest in May, August, and November. Length-frequency distributions showed that primarily adult and subadults were impinged during winter and spring, but that mostly young-of-the-year were impinged during summer and fall. Impingement was usually higher at night than during day.

No threatened or endangered species were collected during 1977, and estimated total impingement at Nine Mile Point was low compared to previous years. The 1977 impingement loss probably had no effect on Lake Ontario fish populations since the much higher annual impingement during previous years was reported to have had no impact on Lake Ontario fish populations.

2. Impingement - James A. FitzPatrick

Fifty fish species were impinged during 1977 at the James A. FitzPatrick Nuclear Power Station. An estimated 333,000 fish were impinged during 1977, representing approximately 6400 kilograms. Alewife and rainbow smelt comprised the largest percentage of the total weight.

Impingement rates were highest during spring and lowest during winter. Most fish impinged during the winter and spring were adults and subadults, but during summer and fall, most were young-of-the-year. Impingement was higher at night than during the day.

Similar to Nine Mile Point, impingement at James A. FitzPatrick during 1977 was low compared to previous years; no threatened or endangered species were collected in these impingement samples.

3. Entrainment - Nine Mile Point

Few fish eggs and larvae were collected in entrainment samples at Nine Mile Point in comparison to the variety of species observed in Lake Ontario samples. Low numbers of eggs were collected in entrainment samples from May through July with only alewife and unidentified eggs represented. Larvae were entrained from May through October, but samples contained only five taxa: alewife, burbot, rainbow smelt, yellow perch, and Morone sp.

Eggs and larvae were generally observed in entrainment samples during the time they were present in the lake. Entrainment impact during 1977 was minimal since lower densities (larvae) and fewer species (eggs and larvae) were observed in the entrainment samples than in lake samples.

4. Entrainment and Viability - James A. FitzPatrick

a. Phytoplankton

Chlorophyll a concentrations of intake samples for the 7-hour incubation period ranged from a low of 0.99 micrograms per liter (µg/ℓ) in November to a high of 15.08 µg/ℓ in May; reflecting a temporal trend similar to that observed in lake samples. The 24-, 48-, and 72-hour incubation period samples exhibited temporal trends similar to the 7-hour incubation period samples.

No consistent differences were observed among day and night samples for chlorophyll a.

Chlorophyll a discharge/intake ratios, a measure of plant entrainment effects, for the 7-, 24-, and 48-hour incubation periods revealed a small reduction in chlorophyll a concentrations at the discharge during approximately 70 percent of the sampling periods.

Chlorophyll a ratios that estimate the effect of plume entrainment (2 or 3^{o} simulation/intake ratios) indicated that 55 to 60 percent of the sampling periods exhibited a decrease in pigment concentrations.

The discharge/intake ratios and simulation/intake ratios indicate that chlorophyll a within the phytoplankton community is reduced somewhat due to

entrainment through the plant or into the thermal plume. A comparison of phytoplankton surveys in the lake with in-plant data suggest that the impact is small.

Primary production values for intake samples were lowest in February and highest during July and August. No consistent relationship was observed between primary production in lake samples and the intake samples.

Discharge/intake ratios during 1977 indicated a slight decrease in primary production rates between the intake and discharge, suggesting some impact during plant entrainment.

Plume simulation/intake ratios indicated that plume entrainment may stimulate primary production, expecially during months when lake water temperatures were low. During 1977, 55 to 60 percent of the samples indicated some stimulation.

b. Zooplankton

Entrainment sampling at the FitzPatrick intake during 1977 yielded a total of 84 zooplankton taxa, comprised primarily of rotifers, copepods, cladocerans, and protozoans. A close similarity was observed in the temporal distribution of microzooplankton in intake samples and along the 20-foot depth contour in Lake Ontario.

Plant-induced mortality within the major zooplankton groups at the James A. FitzPatrick plant was generally highest among Protozoa and lowest among Copepoda. Seasonal patterns in the percentage of dead zooplankton at the intake, discharge, and plume simulation samples were quite similar throughout the year with highest percentage dead occurring in April and November.

A close relationship between plant operating characteristics (volume of cooling water used, discharge temperature, and ΔT) and zooplankton mortality at the discharge was observed. Mortality due to plume entrainment was generally lower than mortality due to plant passage for most of the year (April through December). Plant-induced mortality also varied as a function of natural mortality, in that periods of high-discharge percent dead generally corresponded to periods of high-intake percent dead. Maximum zooplankton plant-induced mortality was 63 percent, however, more than half of the observed mortality estimates were less

than 20 percent. Natural spatial and temporal distribution patterns of zooplankton within the vicinity of these two power plants was not discernibly altered as the result of plant operation.

c. Ichthyoplankton

Fish eggs, including alewife, carp, minnow, and Morone sp., were collected from the FitzPatrick intake during June and July, and a few burbot eggs were collected in February, Seven taxa of larvae were observed in entrainment samples but only alewife and Morone larvae were present during more than two sampling periods.

Eggs and larvae were generally observed in entrainment samples during the periods when they were most abundant in the lake. Average larval densities in entrainment samples were lower than densities observed in Lake Ontario and few taxa (7) were entrained in comparison to the taxa (22) observed in lake samples.

The number of eggs and larvae in viability samples was quite low, precluding any conclusions with respect to mortality or survivability following entrainment.

SECTION II
INTRODUCTION

A. STUDY OBJECTIVES

Ecological studies performed in the vicinity of the Nine Mile Point promontory during 1977 represent continuing study efforts by the Power Authority of the State of New York (PASNY) and Niagara Mohawk Power Corporation (NMPC) which were initiated in 1963 to evaluate the potential effects of existing power station operations at Nine Mile Point on the near-field aquatic ecosystem of Lake Ontario.

There are two nuclear electric generating stations located on the Nine Mile Point promontory on the south shore of Lake Ontario: Nine Mile Point Nuclear Station Unit 1, which has been operating since December 1969, and James A. FitzPatrick Nuclear Station, which began operating in July 1975. A third nuclear station is under construction at this site (Nine Mile Point Nuclear Station Unit 2).

This annual report fulfills the utilities' commitment to assess changes, if any, in the aquatic ecosystem caused by power station operation. The studies also fulfill monitoring requirements imposed by the Nuclear Regulatory Commission (NRC) in their licenses issued to the Nine Mile Point Unit 1 Nuclear Station and the James A. FitzPatrick Nuclear Station. Additionally, other aspects of these studies fulfill the requirements of a Stipulation Agreement between the utilities and the Aquatic Advisory Committee for the Nine Mile Point site.

In addition to the requirements noted above, the program is designed to provide the following information:

- Postoperational data relating to the aquatic ecology in the vicinity of the Nine Mile Point Nuclear Station Unit 1, and the James A. FitzPatrick Nuclear Station.
- Analyses to support future recommendations for more cost-effective monitoring of the aquatic environment that would still assure the protection of the ecosystem over the life of the stations.

B. NINE MILE POINT AND JAMES A. FITZPATRICK POWER STATIONS

The Nine Mile Point Nuclear Station Unit 1 uses a boiling water reactor to provide 610 MWe (net) of electrical power capacity. The maximum cooling water flow of 597 cubic feet per second (cfs) for this unit is taken from the lake through a submerged intake approximately 850 feet offshore of the site (Table II-B 1). This flow is returned to the lake as a thermal discharge, at temperatures up to 17.3°C (31.5°F) higher than the intake temperature, through a submerged discharge in the lake.

Table II-B 1

Operating and Structural Characteristics of Nine Mile Point Unit 1 and James A. FitzPatrick Nuclear Power Stations*

Operating Characteristics	Nine Mile Point UNIT 1		James A. FitzPatrick	
Generating capacity (MWe)	610		821	
Cooling water flow (gpm)				
Condenser (all pumps)	250,000		352,300	
Service water/pump	18,000		17,900	
Heat rejection (BTU/hr)	4.0×10^9		5.7×10^9	
Cooling water temperature rise (°F)	31.2		31.5	
Structural Characteristics	**Intake**	**Discharge**	**Intake**	**Discharge**
Length of main tunnel from existing shoreline	850 ft	335 ft	900 ft	1260 ft
Number of openings	6	6	4	12
Size of opening	5.5 ft high x 10.3 ft wide	3.5 ft high x 7.3 ft wide	8 ft x 17.7 ft wide	2.5 ft (inside diameter)
Other dimensions	3-ft sill 6-in. roof	3-ft sill 2-ft roof	3-ft sill 6-in. roof	5-6 ft above lake bed Double ports at 150-ft. spacing
Velocity through openings	1.8 fps	4 fps	1.2 fps	14 fps
Tunnel velocity	8 fps	8 fps	1.4 fps (maximum)	4.7 fps
Tunnel cross-section	78 ft^2	78 ft^2	117 ft^2	117 ft^2
Water velocity at screens	0.85 fps	–	1.4 fps	–
Water depth at structure	24.5 ft (LWD)	17 ft (LWD)	24 ft (LWD)	30 ft (LWD) (aver.)
Water depth to top of structure	15.3 ft (LWD)	10.0 ft (LWD)	10 ft (LWD)	23 ft (LWD) (aver.)
Total flow	268,000 gpm (597 cfs)	268,000 gpm (597 cfs)	370,200 gpm (825 cfs)	370,200 gpm (825 cfs)

*Based on LMS (1975a)

The James A. FitzPatrick Nuclear Station uses a boiling water reactor to provide 821 MWe (net) of electrical power capacity. The maximum cooling water flow of 825 cfs for this unit is taken from the lake approximately 900 feet offshore of the site (Table II-B 1). This flow is returned to the lake as a thermal discharge, at temperatures up to 17.5°C (31.5°F) higher than the intake temperature, through a high-speed, submerged diffuser-type discharge.

The James A. FitzPatrick Nuclear Station intake is located in approximately 24 feet of water with the intake openings facing toward shore. The FitzPatrick discharge is designed to achieve rapid dilution of the discharge waters with ambient lake water by using submerged jets. The Nine Mile Point Unit 1 intake is located in approximately 25 feet of water about one-half mile to the west of the FitzPatrick intake and discharge. The Nine Mile Point Unit 1 intake withdraws water from 360° in the horizontal angle. The Nine Mile Point discharge design is for a lower velocity than the FitzPatrick design and subsequently achieves less initial dilution of the discharge waters. The locations of the intakes and discharges of the two plants are such that the main influence of plant operations would be at the 20- and 40-foot depth contours in the lake at the NMPP and FITZ transects (Figure II-B 1). The 316(a) Demonstrations for these two power stations (NMPC 1975, LMS 1976b) describe the plant facilities in detail.

The James A. FitzPatrick Nuclear Station achieved criticality in November 1974 and began commercial operation on 28 July 1975. Between July 1975 and December 1977, two extended outages have occurred for refueling and planned maintenance, one in early 1976 (mid-January through March) and the other in 1977 (mid-June through September). The average daily power output during 1977 for the James A. FitzPatrick Nuclear Station is given in Appendix Table H-2 and Table II-B 2 summarizes the plant generation outages from July 1975 through 1977. During a few outages, there was a brief resumption of generation, but these cases were counted as a single event because the plant did not reach a high power level for a sustained period. The circulating water system remains in operation during outages and in almost all instances at least one main circulating pump (267 cfs) continues to run. Since beginning commercial operation, the plant has consistently operated above the 500 MWe gross output when the unit was on line.

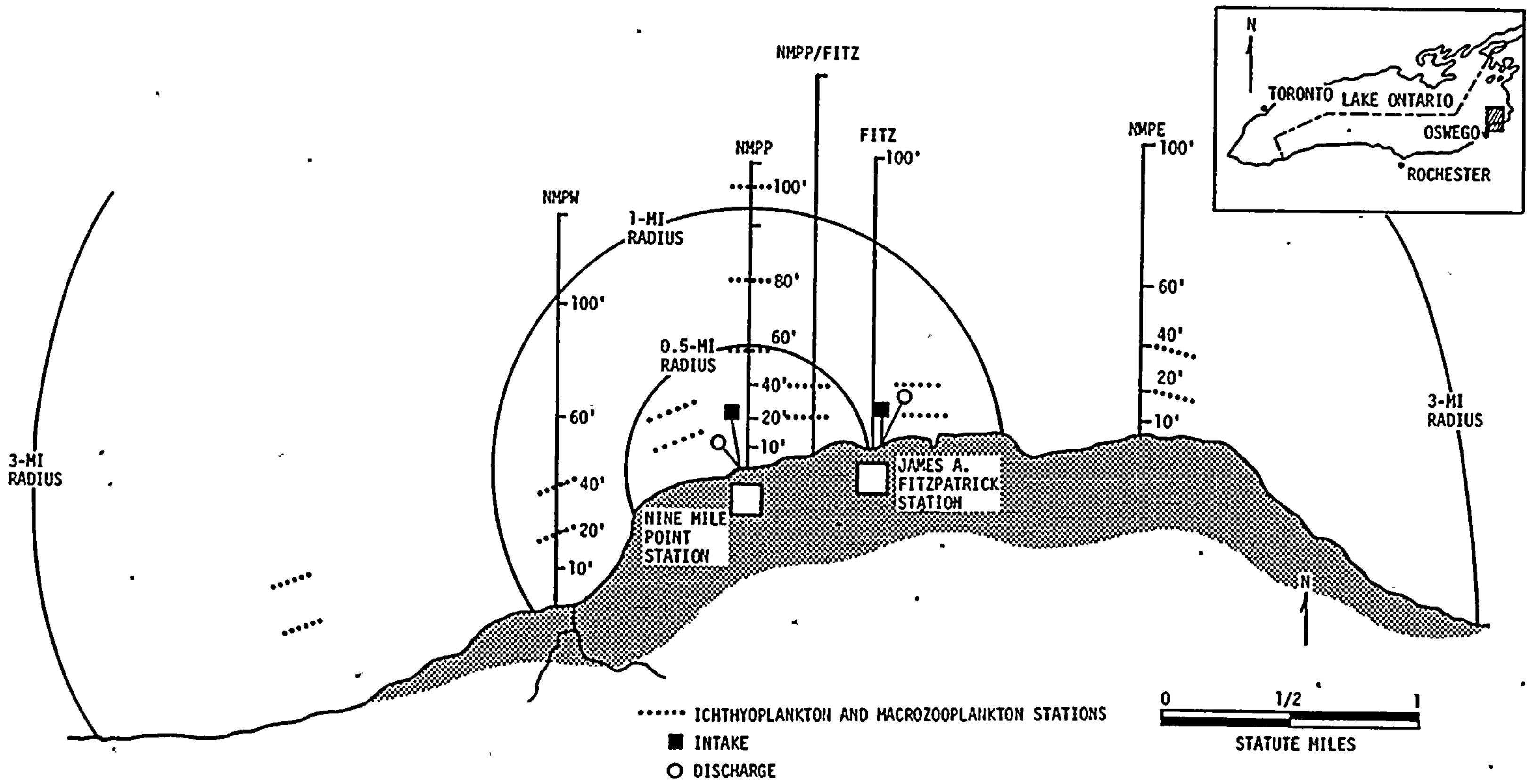


Figure II-B 1. Sampling Area for the Nine Mile Point Aquatic Ecology Studies Showing Location of Sampling Transects and Intake and Discharge Structures

Table II-B 2

Record of Outages of the James A. FitzPatrick Nuclear Power Station from July 1975 through December 1977

Year	Start Date	Duration Generator off* Load (Days)
1975	Jul 17	1
	Aug 4	1
	Sep 1	6
	12	4
	Oct 1	2
	22	2
	29	7
	Nov 11	9
	Dec 8	16
1976	Jan 16	68
	May 13	2
	Jun 4	2
	18	2
	23	2
	30	1
	Jul 13	5
	21	8
	Aug 30	2
	Sep 31	1
	Oct 9	7
	Nov 9	8
	19	7
	Dec 16	2
1977	Jan 22	2
	Feb 1	4
	5	1
	11	1
	28	2
	Mar 7	2
	11	1
	Apr 15	3
	May 6	3
	20	1
	Jun 21	96
	Sep 25	4
	Oct 7	2
	Nov 8	5

*Dates are inclusive in the outage duration. An outage could span two consecutive dates but have a total duration ranging from less than two hours to more than 47 hours. The incident 13 Jul 1976, for example, could be a little more than 3 days but could not exceed 5 days.

Nine Mile Point Unit 1 began commercial operation on 14 December 1969. Between January 1970 and December 1977, extended outages for refueling and planned maintenance have occurred yearly except for 1970 and 1975 when the longest outages lasted only 17 to 18 days (Table II-B 3). The average daily power output during 1977 for Unit 1 is given in Appendix Table H-1 and Table II-B 3 summarizes the

plant generation outages from late 1969-1977. When the plant is on line, power generation usually exceeds 500 MWe, and, like the FitzPatrick station, at least one circulating water pump (278 cfs) is running whenever power production is off.

Figure II-B 1 presents a map of the area showing the general location of the two nuclear power stations with their submerged intakes and discharges. The sampling transects are also indicated on Figure II-B 1 and the exact sampling locations and methods for each task of this study are presented in Section III of this report. For the purpose of this study, the "vicinity" of Nine Mile Point is defined as the area within a 3-mile radius of the generating stations.

Table II-B 3

Record of Outages at the Nine Mile Point Nuclear Power Station from October 1969 to December 1977

Year	Start Date	Duration Generator off* Load (Days)
1969	Oct 5	1
	6	4
	11	1
	12	1
	12	7
	23	1
	26	1
	Nov 2	1
	3	1
	7	4
	8	1
	10	1
	11	1
	13	1
	21	1
	Dec 7	1
	14	1
	15	1
	20	3
	21	1
	24	1
	30	1
1970	Jan 9	1
	12	1
	19	1
	23	1
	24	1
	Feb 8	1
	14	1
	17	1
	20	1
	25	1
	Mar 2	1
	Jul 4	1
	20	1
	21	1
	28	1
	Aug 8	1
	Oct 9	10
	Nov 14	2
	Dec 4	17
1971	Jan 13	5
	24	1
	Feb 11	1
	Apr 3	28
	May 1	28
	28	2
	30	1
	Jun 1	7
	10	1
	11	3
	Jul 15	4
	21	1
	Aug 18	1
	29	1
	30	1
	Sep 18	39
	Dec 31	1
1972	Jan 11	4
	Feb 28	4
	Mar 4	2
	Apr 1	75
	Jun 14	1
	23	2
	26	5
	Jul 22	1
	28	2
	Aug 26	2
	Sep 2	2
	9	2
	21	3
	Oct 7	1
	28	1
	Nov 19	5
1973	Feb 9	7
	23	3
	Apr 8	1
	11	2
	14	60
	Jun 12	2
	15	1
	16	1
	Jul 8	1
	Oct 18	6
	Nov 16	2
	20	1
	26	4
1974	Mar 30	95
	Oct 12	2
	Dec 9	1
	21	11
1975	Jan 1	4
	12	1
	18	1
	Feb 3	1
	3	9
	Mar 8	2
	18	1
	20	2
	Apr 11	2
	Jul 27	2
	Sep 13	83
	Dec 4	1
	6	1
	7	1
	27	1
1976	Mar 2	3
	22	24
	Apr 15	4
	19	1
	May 15	2
	Jun 23	1
	Jul 9	5
	Aug 6	1
	17	2
	Nov 9	6
1977	Feb 23	3
	Mar 5	135
	Oct 21	7
	Nov 7	5
	27	2

*Dates are inclusive in the outage duration. An outage could span two consecutive dates but have a total duration ranging from less than 2 hours to more than 47 hours.

C. LAKE ONTARIO

1. Physical and Limnological Characteristics

Lake Ontario, the easternmost of the five Great Lakes, is roughly oval in shape, approximately 190 miles long and a maximum of 53 miles wide. The maximum reported depth is approximately 840 feet, and its average depth ranges from 250 to 300 feet. It has a surface area of 7,340 square miles and a volume of 390 cubic miles.

Approximately 80 percent of the water supplied to Lake Ontario enters through its natural inlet, the Niagara River, which discharges approximately 200,000 cfs into the lake. The outflow from the lake to the St. Lawrence River averages about 239,000 cfs. Presently, Lake Ontario has a consumptive use near 300 cfs.

The levels and outflows of Lake Ontario are regulated by control structures on the St. Lawrence River under the supervision of the St. Lawrence River Board of Control. The mean monthly water levels of Lake Ontario are maintained between a minimum elevation of 243.06 feet above mean sea level and a maximum elevation of 248.04 feet.

Lake level data for 1977 showed minimum and maximum elevations to be 243.8 and 245.4 feet respectively. The average elevation for Lake Ontario over the 1900-1977 period is 244.0 feet above mean sea level (U.S. Army Corps of Engineers 1978).

The temperature of Lake Ontario varies from about 32°F to 75°F and has a mean value of 45°F. During the winter season, the temperature of the lake is usually above 32°F. Normally, the lake freezes only along the shore and in sheltered bays while the center of the lake remains open and maintains a temperature near 39°. The lake begins to warm by May, reaching highest summer temperatures in late July or early August. The temperature declines during the fall, reaching winter levels in middle to late December.

Lake Ontario was formed about 10,000 years ago during periods of severe glaciation. Marine sedimentary rock-strata composed largely of shale and limestone underlie the lake. The shoreline is eroding at a relatively rapid rate, providing a source of unconsolidated sands, clays, and gravels to the lake. This

and other sources have deposited a sediment layer of as much as 35 feet in the deeper regions of the lake but such layers are generally more shallow elsewhere.

Along the New York shoreline near Nine Mile Point, there is very little deposition of sediment. This is especially true in areas where water depth is less than 40 feet. Bottom substrates within the study area are composed primarily of bedrock overlain with large boulders or rubble (see Section IV-D, Table IV-D 1). Some sand and gravel deposits exist at the 40- and 60-foot depth contours.

The large area of Lake Ontario and its heat capacity provide periodic onshore and offshore breezes due to the heat differential of land and water surfaces. The exposure of the surrounding area to Lake Ontario and the flatness of the terrain allow wind speeds to be higher near the lake than are experienced in most inland areas [International Joint Commission (IJC) 1969].

Major cities on Lake Ontario include Toronto and Hamilton in the northwestern region and Rochester and Oswego in the southeastern region.

The major source of most pollutants in Lake Ontario is Lake Erie and its watershed via the Niagara River. The Oswego River, which empties into Lake Ontario about 6 miles west of the Nine Mile Point area, is also a major point source of several pollutants. The Oswego River drains some 5,100 square miles and receives municipal wastes equivalent to some 500,000 people (IJC 1969).

The water quality of Lake Ontario is dependent upon the interaction of numerous factors, including geomorphology and hydrology, hydrodynamics, meteorology, and man-made inputs. Intensive interest in Lake Ontario water quality has been a fairly recent phenomenon. Reasonably thorough studies of Lake Ontario were completed around 1915 and again in 1947. However, truly comprehensive studies were not undertaken until the early 1960's. A number of studies were executed throughout the 1960's, and studies are continuing.

Lake Ontario generally has the highest concentration of inorganic pollutants of all of the Great Lakes. This is because it drains the chain of Great Lakes, receiving its major source of water and pollutants from Lake Erie via the

Niagara River. Inorganic pollutant concentrations in the other Great Lakes have been increasing steadily since about 1910.

Because of its great depth and dilution capacity, adverse eutrophication effects have been minimal in Lake Ontario in comparison to those for parts of Lake Erie. Oxygen saturation is usually above 80 percent in the hypolimnion during the summer and averages over 90 percent in the epilimnion throughout the year. Epilimnion values may exceed 120 percent, suggesting excessive primary productivity or wind-induced mixing. During thermal stratification, significant chemical stratification may occur, but at relatively low mean values of nutrients. This chemical stratification is a result of seasonal variation in productivity and chemical composition. Nutrients such as orthophosphate, nitrate and silica generally increase from surface to bottom, reflecting uptake by phytoplankton in the photosynthetic zone and perhaps release from the bottom sediments. During spring and fall overturns, the lake becomes homogeneous. Based on an assessment of oxygen saturation, transparency, nutrient concentrations, nutrient loadings, morphometry, and biological populations, Lake Ontario has been estimated to be between oligotrophic and mesotrophic (IJC 1969).

Data from many studies have been analyzed and are presented in Table II-C 1 as semiquantitative values representative of offshore waters of Lake Ontario under mixed conditions (QLM 1974). As discussed above, some of the nutrient values vary temporally and vertically. The major ionic species vary little, but the trace elements and compounds may vary greatly. For example, copper was found to range between 5 and 177 micrograms per liter during 1968 studies (Weiler and Chawla 1969) and between 0 and 2,200 micrograms per liter during 1967 studies (IJC 1969).

Water quality for nearshore stations has been found to vary from that of offshore stations in an irregular manner, affected by local sources of pollution, increased productivity of shallow waters, and the vagaries of currents. Nevertheless, it is expected that the water quality of stations several hundreds to several thousand feet from shore and several thousand feet from pollutant sources would be similar to that presented in Table II-C 1. Contamination of certain game and nongame fish in Lake Ontario by Mirex and polychlorinated biphenyls (PCB) has led New York to restrict their possession and consumption. Neither Mirex nor PCB levels have been found in concentrations that would make Lake Ontario waters unsafe for consumption or recreation.

Table II-C 1

Water Quality Values Characteristic of the Offshore Waters of Lake Ontario under Mixed Conditions*

Parameter	Concentration (mg/l unless shown otherwise)
Calcium	40
Magnesium	8
Sodium	12
Potassium	1.5
Chloride	28
Sulfate	30
Bicarbonate	115
pH	8.0 (units)
Total dissolved solids	200
Specific conductance	300 (μmhos/cm)
Orthophosphate phosphorus	0.015
Total phosphate phosphorus	0.025
Ammonia nitrogen	0.03
Nitrate nitrogen	0.20
Nitrite nitrogen	0.002
Total Kjeldahl nitrogen	0.2
Silicon dioxide	0.5
Turbidity	2 (JTU)
Total suspended solids	3
Phenol	0.002
Total coliform	<1 (counts per 100 ml)
Cadmium	0.0001
Chromium	0.001
Cobalt	0.0001
Copper	0.01
Iron	0.01
Lead	0.003
Lithium	0.002
Manganese	0.001
Nickel	0.002
Strontium	0.18
Zinc	0.01

*Based on QLM (1974)

2. General Lake Currents*

In its simplest form the large scale, general circulation of Lake Ontario is counterclockwise (cyclonic flow) with flow to the east along the south shore in a relatively narrow band and a shomewhat less pronounced flow to the west along the north shore. The conceptual model that explains this average circulation is presented here with a minimum of detail.

*Most of this material is extrapolated from previous reports.

a. Summer Circulation

A cool mound of water is found to extend from surface to bottom in spring and from below the thermocline to the bottom in summer and fall (Sweers 1969). The baroclinic flow resulting from the horizontal temperature differences is initially directed outward from midlake toward the shore. Although the Coriolis effect is acting to turn the flow to the right (clockwise), its effect is diminished due to bottom friction. This outward flow brings water to the inshore area, where it begins to pile up. A surface slope, higher inshore than in midlake, develops into a barotropic current initally directed lakeward. The barotropic current tends to the right because of the Coriolis effect. The result is that the Coriolis effect and the barrier effect of the coastline trap the flow against the shoreline. The flow continues along the shoreline in a counterclockwise direction as long as the surface slope is maintained.

Inflow from the Niagara River causes the western end of the lake to be higher than the eastern end (on the average). The resulting flow down the gradient is held against the lake's south shore by the Coriolis effect, thereby enhancing the already existing barotropic flow along the south shore. Wind stress averaged over the year tends further to accelerate the flow to the east and decelerate the flow to the west.

b. Winter Circulation

The general circulation in winter is less well-documented. In late fall after overturn has occurred, the lake is essentially isothermal, thereby permitting a freer exchange of water from surface to bottom. Average wind direction in winter is primarily from the west-northwest. The net surface flow that results is eastward with westward return flow developing below the surface. The surface layer in the western end is advected to the east and is replaced by subsurface water (Sweers 1969). This large scale upwelling at the upwind end of the lake and downwelling at the downwind end mixes the surface and subsurface water on a scale that is not likely to occur during the rest of the year.

Pollutants that are limited to the upper layer during the time of a well-developed thermocline are diluted when the hypolimnetic water is made available for mixing. In spring, with the development of the thermocline, the bottom water is again partially insulated from the surface layer.

c. Transient Response

The general circulation described above is documented by observations collected over long periods (months). The circulation patterns that are observed at any given time, however, are more complex as a result of the transient wind distribution and the lake's response to the nonsteady wind. Sometimes a major wind shift can alter the currents in a matter of hours, while at other times some features of the current pattern have continued even with an opposing wind (Csanady 1972). One measure of the response time of the currents to a shift in wind distribution is partially related to the scale of the current; large features such as the coastal jet respond more sluggishly, whereas nearer to shore the response is seen to be more rapid, 6 hours or less. Additionally, the deeper the current, the more slowly it responds. A shift in the currents as a result of wind changes eventually changes the lake surface slope and the temperature field, forcing an alteration in much of the lake's circulation pattern.

3. Local Currents

In the course of preoperational studies for the James A. FitzPatrick Nuclear Power Plant, current measurements were made off the Nine Mile Point promontory from May to October 1969, and July to October 1970 (Gunwaldson et al. 1970, PASNY 1971). The field data clearly illustrated a correlation between summer currents and wind speed. The correlation is an accepted principle of hydrodynamics as theorized by Ekamn (1928) and subsequently verified by numerous oceanographers (e.g., Neumann and Pierson 1966). Measurements of wind currents at lightships (Haight 1942) have been analyzed to determine the ratio of current speed to wind speed and reported values of this ratio, commonly called the "wind factor," range between 0.005 and 0.030.

The wind speed frequency data indicated that over the year winds in excess of 32 kilometers per hour [20 miles per hour (mph)] occurred 21.6 percent of the time, based on readings averaged over a 6-hour period. For the summer months (June through September), winds in excess of 32 km/hr (20 mph) occurred 13.9 percent of the time. The current speed of 6-hour duration exceeded with comparable frequency in 14 meters (46 feet) of water was about 15 centimeters per second (cm/sec) [0.5 feet per second (fps)]. For a persistence of 24 hours, the current speed that was exceeded 13.9 percent of the time was 13.7 cm/sec (0.45 fps).

The predominant direction of currents in the studies previously described was alongshore, as dictated by continuity. On those occasions when onshore or offshore currents were observed, their magnitudes were substantially less than those for alongshore currents. During the summer currents alongshore from the west or east were equally frequent about 33 percent of the time for each. Onshore and offshore currents each accounted for nearly 5 percent of the observations. The remaining 30 percent of the observations were below the meter threshold, 0.05 knots (2.5 cm/sec, 0.09 fps). At the 6.4-meter (21-foot) depth in 14.0 meters (46 feet) of water, the mean onshore current speed was 3.0 cm/sec (0.09 fps) and the mean offshore current speed was 6.0 cm/sec (0.2 fps). On the other hand, alongshore currents from the west and east averaged 9 cm/sec (0.3 fps).

Lake currents were measured at selected locations in the immediate vicinity of the Oswego Steam Station (about 6 miles west of Nine Mile Point) on five days between 12 October and 19 November 1970. These surface current velocities were mostly alongshore with speeds that ranged from less than 2.5 cm/sec (0.08 fps) to 15 cm/sec (0.50 fps). These data were consistent with measurements at Nine Mile Point and with wind current frequencies reported by Palmer and Izatt (1970) for Ontario waters of similar depth near Toronto, Canada.

D. PREVIOUS STUDIES

In order to assess the effects of an electric generating station on the aquatic communities of a waterbody, the water quality of the area and the abundance, species composition, and distribution of the biota in relation to power plant operation must be delineated. This section provides background information for the Nine Mile Point area based on studies at Nine Mile Point and other areas of Lake Ontario. Previous studies dealing with the major biological groups present in the study area are considered.

Prior to 1971, ecological investigations in the vicinity of Nine Mile Point were conducted by Dr. J. F. Storr under contract to Niagara Mohawk Power Corporation (Storr 1973). Storr collected data concerning the basic current flow patterns, and the plankton, benthos, and fish populations observed in the area from 1963 to the early 1970's. In addition, Dr. Storr has continued to conduct extensive fish movement (tagging) studies in the area up to the present. (Storr 1977).

Lawler, Matusky, and Skelly (LMS) conducted ecological investigations of the aquatic ecosystem in the vicinity of Nine Mile Point from 1972 through early 1977. These studies were associated with Niagara Mohawk Power Corporation's fossil-fueled Oswego Steam Station as well as the two nuclear stations at Nine Mile Point. Because the generating stations at Oswego and Nine Mile Point are in close proximity (Oswego is approximately 8 miles to the west), ecological data from both sites are utilized to establish ecological conditions in the near-shore area.

The programs conducted by LMS (QLM 1973a, 1973b, and 1974; LMS 1975a, 1976a, and 1977a) at Nine Mile Point consisted of surveys of plankton (phytoplankton, zooplankton, and ichthyoplankton), benthos, and fish populations during the spring through fall periods at various depths and transect locations. Impingement and entrainment of nektonic and planktonic populations were also monitored at the stations' intakes. Water quality was investigated by LMS through 1976 in the vicinity of Nine Mile Point, including monthly determinations of inorganic nutrients, metals, dissolved oxygen (DO), temperature, pH, and BOD concentrations.

Other studies in the immediate vicinity of the study area have been conducted by the Lake Ontario Environmental Laboratory (LOTEL) for Rochester Gas and Electric (RGE 1974), by McNaught and Fenlon (1972), and McNaught and Buzzard (1973). The latter studies were concerned with the effects of plant operation on phytoplankton productivity and zooplankton populations.

1. Phytoplankton

There is a limited amount of information available on the phytoplankton community of the Great Lakes, and Lake Ontario in particular. Some of the more recent studies have been listed in literature reviews or previous environmental reports by Davis (1966 and 1969), QLM (1972 and 1974), and LMS (1975a). These studies showed all phytoplankton divisions are present in Lake Ontario. Diatoms make up as much as 80 percent of the nearshore phytoplankton during the winter and spring. Summer phytoplankton consists of green and blue-green algae and a few diatoms. Over the entire yearly cycle, the most important constituents of the phytoplankton were the diatoms, phytoflagellates and green algae. Previous taxonomic studies have indicated that more than 300 phytoplankton taxa exist in Lake Ontario with the majority of the taxa from the green algae (Munawar and Nauwerck 1971). The diversity of phytoplankton in Lake Ontario is similar to that found in oligotrophic lakes.

Several investigators have described seasonal patterns of phytoplankton occurrence in Lake Ontario (Davis 1966; Nalewajko 1966, 1967; Munawar and Nauwerck 1971; QLM 1972, 1974). The seasonal patterns are correlated closely with natural changes in physical conditions, i.e., water temperature and light intensity, and with the supply of dissolved inorganic nutrients. Although there is some phytoplankton growth throughout the year, the annual cycle is usually characterized by two periods of rapid and unusually intense phytoplankton growth, termed "pulses" or "blooms." One pulse occurs during the spring and is dominated by diatoms; the other pulse occurs during the fall and is usually dominated by green and/or blue-green algae.

The seasonal patterns of phytoplankton observed in the vicinity of the Nine Mile Point reflect seasonal patterns previously reported in Lake Ontario. The diatom community during the winter and spring is composed principally of

Asterionella spp., Fragilaria spp., Cyclotella spp., Melosira spp., and Tabellaria spp. During the summer and fall, blue-green algae such as Oscillatoria spp. and Microcystis spp., and green algae such as Scenedesmus spp., Pediastrum spp., and Ankistrodesmus spp., are the major taxa of the community. Cryptomonas spp. and Rhodomonas spp., both phytoflagellates, appear as members of the community throughout the year although generally their density increases during winter.

During previous years, the larger aquatic vegetation in the lake was dominated by Cladophora glomerata, a long filamentous algae attached by a holdfast to rocks and other submerged substrates. Colonization and propagation of Cladophora extends out to a depth of about 20 feet and the long, growing strands of Cladophora in water 5 feet deep or less are constantly being broken off by wave activity. Maximum growth usually occurs in water about 10-15 feet deep, but this will vary, depending upon the turbidity of the water (Wezernak et al 1974). Cladophora grows at water temperatures ranging from 53°F to 77°F, but has an optimum growing temperature of 64°F. Growth of Cladophora begins in late May, reaches a peak in late June or early July, and declines during the warmer summer period of late July and early August (Storr and Sweeney 1971). As temperatures drop, a secondary peak may occur in late August and growth ceases in September due to decreasing light and temperature.

2. Zooplankton

Classifications according to size are widely used for distinguishing smaller and larger members of the zooplankton community. For the purposes of surveys in the Nine Mile Point vicinity, the term "macrozooplankton" is defined as those invertebrate zooplankton retained in a 571-micron mesh plankton net. Microzooplankton are functionally defined as the zooplankton ranging in size from 76 to 571 microns. However, invertebrate crustaceans of the same species may be found in both the macrozooplankton and microzooplankton collections due to the wide range of sizes encompassed by the developmental stages of these organisms.

Eleven major macrozooplankton taxa have been identified from collections made in the vicinity of Nine Mile Point and Oswego (QLM 1974; LMS 1975a, 1976a). The dominant macrozooplankton groups are cladocerans, copepods, and amphipods; and the macrozooplankton community is frequently dominated by the cladoceran,

Leptodora kindtii. The amphipod, Gammarus fasciatus, is also abundant. Nematodes, hydroids, insect larvae (mainly diptera), gastropods, and isopods are observed occasionally in macrozooplankton samples. Two species of macrozooplankton, Pontoporeia affinis and Mysis ocolata relicta, which are cold-water glacial relict species, are observed primarily during periods of cold water upwellings.

Some macrozooplankton typically exhibit diel vertical migrations. For example, Gammarus fasciatus moves into the water column during the night, while during the day most are found in an epibenthic habitat (LMS 1977a).

The microzooplankton component of the total zooplankton community in the vicinity of Nine Mile Point is typically composed of four major taxonomic groups: rotifers, cladocerans, copepods, and protozoans (LMS 1975a, 1975b, 1976a, 1976b, 1977a, 1977b; Storr 1973).

Rotifers generally contribute the greatest percentage of microzooplankton abundance. Members of this taxa exhibit a bimodal pattern of seasonal abundance, with the first and normally largest pulse occurring during July and a second pulse in the early fall period. Sampling conducted by Storr (1973) and QLM (1974) both observed the dominant rotifer to be Keratella spp.

Cladocerans generally form the second highest percentage of the total microzooplankton population (QLM 1974). The seasonal pattern of cladoceran abundance is bimodal; the first peak occurs during July while the second and usually greater peak occurs during October or November. Storr (1973) found Bosmina longirostris to be the dominant cladoceran with peak abundance for the species in the late summer/early fall period. Daphnia spp. was the most abundant spring cladoceran. Differences have been noted in species composition and seasonal trends between the Oswego and Nine Mile Point areas. These differences were most likely the result of Oswego River influence on the lake biota (Storr 1973).

Copepods in the vicinity of Nine Mile Point exhibit a seasonal cycle similar to Cladocera, with nauplii typically abundant during the spring and adults in late summer (LMS 1976a).

Protozoan abundance has been found to be highly variable; however, the general trend is for the lowest abundance to occur during the winter and highest abundance during the summer (LMS 1975a). The dominant protozoans identified belong to the family Vorticellidae.

Glooschenko et al (1972) found a bimodal pattern in the seasonal abundance of zooplankton at a station in eastern Lake Ontario. The occurrence of two peaks of abundance was similar to that observed by LMS in the vicinity of the Nine Mile Point Nuclear Station, but the number of organisms found by Glooschenko et al was about an order of magnitude less than the number of organisms found in the vicinity of the Nine Mile Point Nuclear Station and Oswego (QLM 1972 and 1974).

3. Benthic Invertebrates

Studies of the benthic community in Lake Ontario show that several organisms exhibit distinct distributional patterns. Brinkhurst (1969 and 1970) reported that the general distribution of benthos in Lake Ontario followed the distribution of benthos in temperate oligotrophic water bodies having some inshore areas supporting eutrophic forms. Historically, benthic studies have been concentrated in the eastern portion of Lake Ontario (Johnson and Matheson 1968; Johnson and Brinkhurst 1971a and 1971b). The entire lake, including some stations in the Nine Mile Point area, has been sampled by Hiltunen (1969) and Kinney (1972) while other studies have been concentrated entirely in and around Oswego (Judd and Gemmel 1971, Storr 1973, QLM 1972).

The species composition and abundance of benthic macroinvertebrates has been shown to vary with depth in Lake Ontario. For example, the benthic fauna was reported to increase in abundance and diversity with increasing depth (Judd and Gemmel 1971), and Brinkhurst (1969) reported the presence of eutrophic species in the inshore area of the lake.

In the deeper portions of Lake Ontario, benthic populations are dominated primarily by the amphipod, Pontoporeia affinis, and oligochaetes (Cook and Johnson 1974). In the nearshore zone, the natural assemblage apparently consists of Pontoporeia affinis, Stylodrilus spp., Limnodrilus spp., Tubifex spp., plus a variety of chironomids and sphaeriids.

Species of seven phyla (Nematoda, Mollusca, Platyhelminthes, Arthropoda, Annelida, Coelenterata, and Nemertea) constitute the benthic community in the Nine Mile Point vicinity (LMS 1977a). These phyla included approximately 85 genera.

Phylum Arthropoda, represented by 45 species, include the most abundant organisms in the area; for example, Gammarus fasciatus is frequently the most dominant species collected. Members of the order Oligochaeta are relatively abundant throughout the year and tubificid worms (Family Tubificidae) are abundant in all seasons and at most transects. The majority of the organisms collected represent species associated primarily with the surface of the substrate, i.e., epibenthic species, such as Gammarus fasciatus. However, several infaunal forms, including members of the class Nematoda, have been collected.

Differences observed in the distribution and species abundance of benthic invertebrates between stations and transects are attributed to animal-substrate relationships. For example, Gammarus and Manayunkia are associated with bedrock substrate, while the nematode Dorylaimus, tubificids, and the dipteran Cryptochironomus are abundant where substrates are mostly sand and silt.

Benthic invertebrates in the Nine Mile Point vicinity have a seasonal growth and reproduction pattern similar to that reported by Fretwell (1972) and Odum (1971) for temperate zones. Seasonally, the abundance of macroinvertebrates may exhibit the following typical sequence: Polychaetes and gastropods dominate in the spring while oligochaetes and ostracods are abundant in early summer. The amphipod Gammarus fasciatus is frequently the dominant organism during late summer and throughout the fall (October-December) but polychaetes and oligochaetes also may be common in the fall.

The trend of greater benthic invertebrate abundance during spring and fall periods may be due to the presence of actively growing Cladophora, a filamentous green alga which provides food and refuge for many invertebrate populations. During 1974 and 1975, Cladophora exhibited a maximum seasonal abundance in June (LMS 1976a). Cladophora biomass decreased rapidly with depth, and was either scarce or nonexistent at depths of 30 and 40 feet. This was previously noted by Neil and Owen (1964). Christie (1974) attributes the increased productivity observed in Lake Ontario during recent years to the growth of Cladophora and its associated fauna.

4. Ichthyoplankton

Fish eggs and larvae are most abundant in the Nine Mile Point area of Lake Ontario from April through September; however, some eggs have been collected as early as February and larvae have been observed in December. Published data on the abundance and distribution of ichthyoplankton in the eastern end of Lake Ontario is limited primarily to annual reports of aquatic ecology studies in the vicinity of Nine Mile Point (QLM 1974; LMS 1975a, 1976a, and 1977a) and studies related to the effects of entrainment and thermal discharges at the three existing power stations in the Oswego-Nine Mile Point area (NMPC 1975; NMPC 1976b, 1976c, and 1976d; and LMS 1976b and 1977b). Additional information on fish eggs and larvae in the Great Lakes includes studies on Lake Michigan (Norden 1968, Jude et al 1975, TI 1976) and Lake Erie (Nelson and Cole 1975; TI 1977a, 1977b, and 1977c; Wolfert et al 1977).

Over the last five years, annual surveys have reported between 15 and 22 taxa of eggs and larvae in the Nine Mile Point area, and alewife have consistently dominated the ichthyoplankton community (LMS 1977a and 1977b). Other relatively abundant species in the area are rainbow smelts, white perch, sculpin, and johnny darter. The temporal distribution of eggs and larvae in the Nine Mile Point area is characterized by two basic spawning groups. Species typically spawning in the winter and early spring such as burbot, *Coregonus* spp., rainbow smelt, and yellow perch form the first group. Eggs and larvae of this group are most abundant during April, May, and early June. The second group is composed of late spring and summer spawning species such as alewife, white perch, and carp. The larvae of these species are most abundant in July and August.

Eggs and young larvae are apparently more abundant at the 20- than the 40-foot depth contour near Nine Mile Point (LMS 1975a), but larvae tend to move offshore into deeper water as they mature. A similar onshore-offshore distribution for larvae has been observed during an ecological study in Lake Erie (NMPC 1976a).

Egg and larvae densities in the Nine Mile Point area are relatively low, with the exception of alewife. During a review of Nine Mile Point studies, Williams et al (1975) indicated that the area does not contain desirable spawning and nursery sites because of nearshore wave action, bedrock/rubble substrate, and potentially extensive beds of *Cladophora*.

5. Fish (Nekton)

The Great Lakes contain an extensive fish fauna which includes representatives of most of the important families of North America freshwater fishes. Hubbs and Lagler (1958) list 173 species of native and introduced fish in 28 families for the Great Lakes and their tributaries.

Lake Ontario has one of the most diverse fish communities of the five Laurentian Great Lakes, including 112 species in 25 families (Ryder 1972). Historically, the offshore fish community in Lake Ontario was composed principally of oligotrophic or coldwater fish such as Coregonus spp. (whitefish, ciscos, and chubs), lake trout, and burbot while the nearshore waters contained a more diverse fish fauna composed of many varieties of basically warm-water fish (Christie 1974). However, the combined effects of commercial fishing, modification of the drainage basin through construction of dams and canals, establishment of invading or introduced marine species such as the alewife and sea lamprey, cultural eutrophication (Smith 1972a and 1972b), and possibly other factors have resulted in a change in the Lake Ontario fish community so that it is now dominated by alewife, rainbow smelt, white perch, and yellow perch (Christie 1973, 1974). Associated with this shift in species composition was a corresponding change in the use of Lake Ontario by the present fish community. Whereas the historically prominent fish species were wide-ranging piscivores (feed on fish) and pelagic (open water) plankton feeders that utilized the entire area of the lake, the present fish community has definite patterns of movement that leave areas of the lake vacated during certain seasons of the year. During spring, alewife and rainbow smelt undergo extensive migrations from the depths of the lake to spawn in nearshore areas or in tributaries and small streams. After spawning, these species migrate out into the lake and occupy varying strata of water during the summer. During fall, alewife migrate to the deeper waters to overwinter while rainbow smelt migrate to and overwinter in nearshore areas.

The fish community in the Nine Mile Point area of Lake Ontario has been intensively sampled from March 1973 through December 1977 by trawling, gill netting, and seining (QLM 1974; LMS 1975a, 1976a, 1977a). Prior to 1973 fish were collected intermittently by Storr (1973) using gill nets and trap nets. Approximately 50 species have been identified from samples taken during this period and alewife has been the dominant species collected. Other abundant species are rainbow smelt, spottail shiner, yellow perch, and white perch.

Seasonal abundance of fish in the Nine Mile Point vicinity is typical of that observed for the Lake Ontario fish community. The greatest abundance of fish is usually observed during the spring months, corresponding with the spawning of rainbow smelt and the shoreward spawning migration of alewife. Abundance and diversity are lowest during the warm summer months and then increase, especially in diversity, during the fall. Lower abundance and diversity during summer is due, in part, to post-spawning migrations from the area by adults and selectivity of the sampling gear in relation to collecting the smaller juvenile fish.

Studies concerning fish impingement at power stations prior to 1970 are limited but substantial data on this subject have become available in recent years. Edsall and Yocum (1972) provided a fairly complete summary of the earlier industry-related fish impingement studies on the Great Lakes and a more recent review was presented by Sharma and Freeman (1977). Impingement of fish has been documented in Lake Huron (Edsall and Yocum 1972), Lake Erie (TI 1977b and 1977c), Lake Micigan (TI 1976), and at various locations in Lake Ontario (LMS 1977b). locations in Lake Ontario (LMS 1977b).

Impingement monitoring studies in the Nine Mile Point area of Lake Ontario were initiated in 1972 at the Nine Mile Point Nuclear Station, and in 1975 at the James A. FitzPatrick Nuclear Station, and have continued to the present (QLM 1973b, 1974; LMS 1975b, 1976b, 1977a, 1977b). Approximately 60 species have been identified from samples taken at the two nuclear plants during this period. Alewife, rainbow smelt, and in later years, threespine stickleback have been the dominant species collected. Other relatively abundant species are gizzard shad, emerald shiner, spottail shiner, and sculpin. Estimates of the total yearly impingement have ranged from approximately 1 to 5 million fish at the Nine Mile Point Nuclear Station and was approximately 4 million fish during the first complete year of sampling at the James A. FitzPatrick Nuclear Station.

Highest impingement rates usually occur during spring, coinciding with the spawning of rainbow smelt and the inshore spawning migration of alewife while lowest impingement rates occur during summer and probably reflect post-spawning migrations by adults to deeper water. Fall rates usually show a secondary peak in impingement rates as the young-of-the-year fish become large enough to be impinged.

In a report evaluating the potential impact of impingement at the James A. FitzPatrick station, LMS (1977b) indicated that current impingement losses attributable to power plants on Lake Ontario have no measurable direct or indirect impact on the present sport or commercial fisheries. Murarka (1976), however, recommended gathering additional fisheries data on Lake Ontario populations in order to properly determine the ecological significance of fish impingement at the Nine Mile Point plant on the Lake Ontario fishery.

SECTION III

METHODS AND MATERIALS

A. LAKE ONTARIO STUDIES

The sampling design and methods described in this section represent a program that has evolved during several years of ecological studies on Lake Ontario in the vicinity of two nuclear power stations, Nine Mile Point (NMP) and James A. FitzPatrick (JAF), which began operation in December 1969 and July 1975, respectively. Biological surveys began in the vicinity of Nine Mile Point in the mid-1960s, and intensive ecological studies that employ methods similar to those described in this section have been conducted since the early 1970s.

Most Lake Ontario program sampling has been conducted along four transects extending perpendicular from the shoreline (Figure III-1 and Table III-1). The transects - NMPP (Nine Mile Point Plant) and FITZ (J.A. FitzPatrick Plant) represent a zone in the lake near the two plants' submerged intake and discharge structures. This zone is most likely to be influenced by the removal of cooling water and by subsequent thermal discharges and has been referred to as the experimental area. The transect to the west of the power stations, NMPW (Nine Mile Point West) was upcurrent of the experimental area most of the time with respect to the prevailing currents and thus represented a zone considered outside the influence of the intakes and thermal discharges; this area has been referred to as the control area. The NMPE (Nine Mile Point East) transect was sually downcurrent from the discharge structures with respect to the prevailing currents and represented an area that might be influenced by the thermal discharges. This zone has been referred to as the farfield or control area. A transect called NMPP/FITZ was intermediate between the two experimental-zone transects (Figure III-1); it represented the trawling stations in the experimental zone, since trawling was conducted along depth contours and normally began near the FITZ transect and terminated near the NMPP transect. Also, along the NMPP/FITZ transect, some water quality samples were taken.

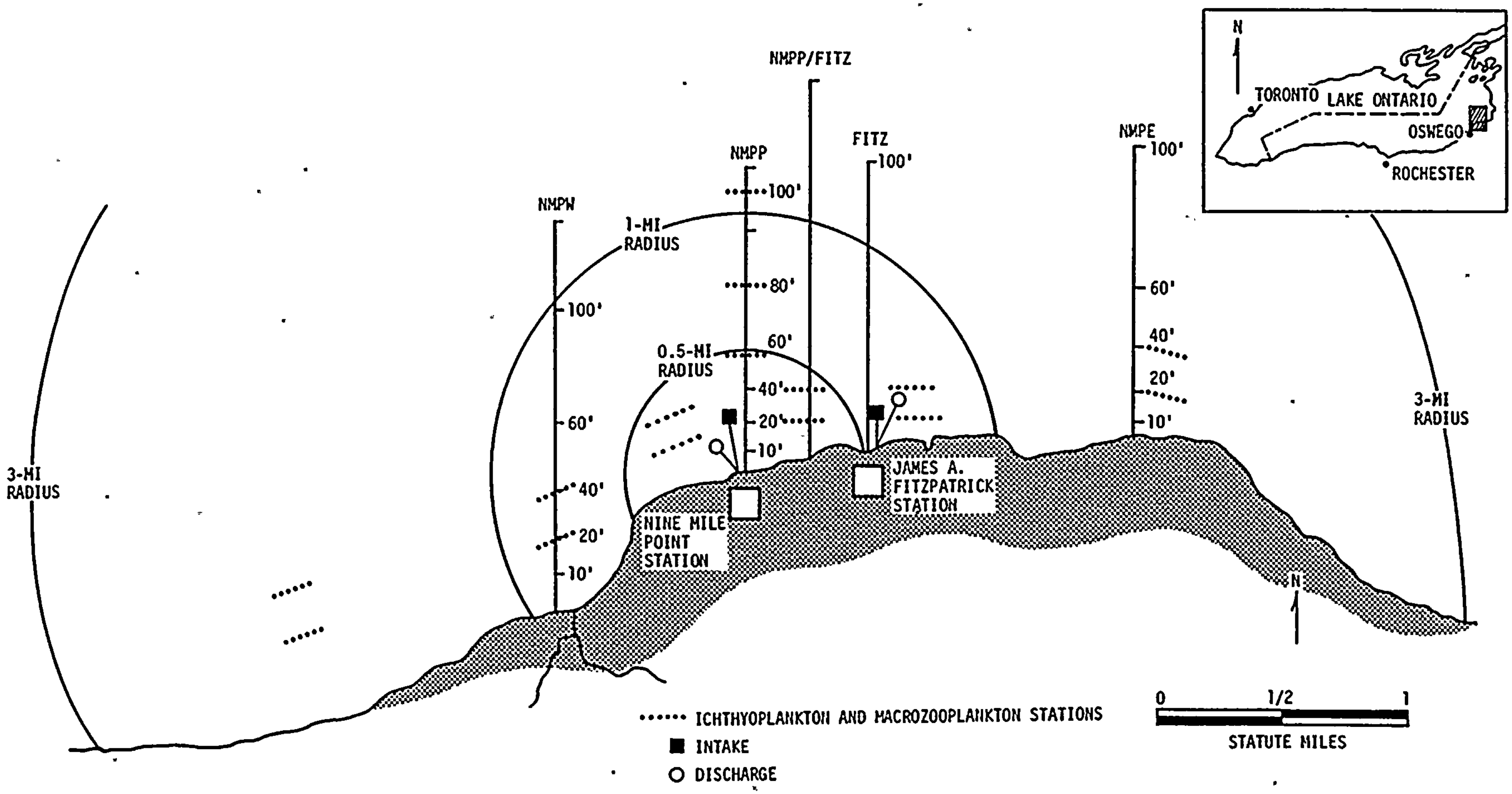


Figure III-1. Sampling Locations for Lake Ontario Ecological Studies near Nine Mile Point and James A. FitzPatrick Power Plants, 1977

Table III-1

Sampling Schedule for Aquatic Ecology Studies in Lake Ontario near Nine Mile Point and James A. FitzPatrick Power Plants, 1977

Task	Frequency*	Season	Depth Contour (ft)	Transect	Depth	Samples per Year**	Comments
Phytoplankton							
Densities	Monthly (D)	Apr-Dec	10,20,40,60	NMPW,NMPP,FITZ,NMPE	Surface and light levels	342	At the 40-ft contour on the NMPE transect, phytoplankton, chlorophyll a, and ^{14}C samples are collected at the 50, 25, and 1 percent light transmittance levels in addition to surface samples.
Chlorophyll a	Monthly (D)	Apr-Dec	10,20,40,60	NMPW,NMPP,FITZ,NMPE		342	
Primary production (^{14}C)	Monthly (D)	Apr-Dec	10,20,40,60	NMPW,NMPP,FITZ,NMPE		513	Primary production sampling involves a larger number of samples per year because there are two light and one dark bottle per sampling location.
Zooplankton							
Microzooplankton	Monthly (D)	Apr-Dec	10,20,40,60	NMPW,NMPP,FITZ,NMPE	Oblique tows	288	
Macrozooplankton	Monthly (D)	Apr-Dec	20,40,60,80,100	0.5-, 1-, 3-mi radii	Composite of surface mid-depth, bottom tows	135	There are six sampling stations along both the 20- and 40-ft contours within areas bounded by 0.5-, 1-, and 3-mile radii and single stations at the 60-, 80-, and 100-ft contours along NMPP (see Figure III-1).
Periphyton							
Bottom substrates	Monthly (D)	Apr-Dec	5,10,20,30,40	NMPW,NMPP,FITZ,NMPE	Bottom	640	Artificial substrates are set in April and retrieved for the first time in May.
Suspended substrates	Monthly (D)	May-Sep	40	NMPW,NMPE,FITZ	2, 7, 12, 17 ft from surface	120	The NMPP/FITZ transect is located midway between the two transects extending offshore from the Nine Mile Point and James A. FitzPatrick Power Plants (Figure II-1).
Benthic Invertebrates	Bimonthly† (D)	Apr-Dec	10,20,30,40,60	NMPW,NMPP,FITZ,NMPE	Bottom	200	
Ichthyoplankton	Weekly (D) Weekly (N) Semimonthly†(D)	Apr-Nov (D) Jun to mid-Sep (N) Dec	20,40,60,80,100	0.5, 1-, 3-mi radii	Surface, mid-depth, bottom tows	2340	See Figure III-1 for transect locations.
Fisheries							
Trawls	Semimonthly (D/N)	Apr-Dec	20,40,60	NMPW,NMPE,NMPP/FITZ	Entire water column	324	Trawl tows for the NMPP/FITZ transect begin near the FITZ transect and end near the NMPP transect.
Gill net	Semimonthly (D/N)	Apr-Dec	15,20,30,40,60	NMPW,NMPP,FITZ,NMPE	Bottom	1260	Along the 20-ft contour, the NMPP transect is not sampled. Each gill net sample is approximately 12 hr long, representing the time between sunrise and sunset or between sunset and sunrise.
Beach seine	Semimonthly (D)	Apr-Dec	Shoreline	NMPW,NMPP,FITZ,NMPE	Bottom	72	
Trap net	Semimonthly (N)	Apr-Dec	20	NMPW,NMPP,FITZ,NMPE	Bottom	72	
Water Quality							
11 parameters (Group I)	Monthly (D)	Apr-Dec	20,40	NMPW,FITZ,NMPE	Surface	54	
17 parameters (Group II)	Semimonthly (D)	Apr-Dec	20,60	NMPW,NMPP,NMPE	Surface	108	
48 parameters (Group III)	Monthly (D)	Apr-Dec	25,45	NMPP/FITZ	Surface,bottom	36	
Temperature Profiles	Weekly (D)	Apr-Dec	100	NMPW,FITZ,NMPE	At 1-m intervals from surface to bottom	117	

*(D) = day sampling
(N) = night sampling
**Details on sampling requirements (number of replicates, samples per month, etc) are presented in Section II of the SOP for the Nine Mile Point Ecological Monitoring Program.
†Bimonthly is defined as every other month; semimonthly as twice per month.

Ichthyoplankton (fish eggs and larvae) samples were collected at stations shown in Figure III-1. Along the 20- and 40-foot contours, tows were made both to the east and west within zones located approximately 0.5, 1, and 3 miles from the Nine Mile Point Station. Directly north of the Nine Mile Point Station, ichthyoplankton tows were made at the 60-, 80-, and 100-foot contours on the NMPP transect. Macrozooplankton was sampled at the same locations used for ichthyoplankton (Table III-1).

The periphyton community and planktonic components of the aquatic ecosystem except ichthyoplankton were sampled monthly (Table III-1). To monitor life stages that may be in the area for only a few weeks, ichthyoplankton was sampled weekly, except as shown in Table III-1. The fish community was sampled twice per month, the relatively sedentary benthic invertebrate community every other month. Various water quality parameters were measured monthly or twice per month, and temperature profiles were obtained weekly at three stations on the 100-foot contour to determine the temperature structure offshore of the power plants and document the extent of stratification.

1. Phytoplankton

Phytoplankton are primary producers, forming the base of the food chain in most aquatic ecosystems. They are usually microscopic and suspended in the water column. In this study, the phytoplankton community was characterized by determining cell densities, chlorophyll a concentrations, and primary production rates in the control and experimental areas.

a. Field Sampling

Replicate whole-water samples were collected along the four principal transects at the 10-, 20-, 40-, and 60-foot depth contours (Figure III-1 and Table III-1). Samples were taken from 1 meter below the surface at each location. In addition, at the 40-foot contour of the NMPE transect, samples were collected at the 50, 25, and 1 percent light transmittance levels determined with a Kahlsico Model 268WA310 submarine photometer. In-situ water temperatures were taken during all samples.

The two replicate samples at each location were composited before the subsamples were removed. For phytoplankton densities, two 3.8-liter subsamples

were withdrawn and preserved with acid Lugol's (1:100 concentration). Two 1-liter subsamples were withdrawn for chlorophyll a analysis and were placed on ice in the ark. For primary productivity, one dark and two light BOD bottles (300 milliliters) were filled from each composite sample. The water was passed through a 300-micrometer mesh net to exclude larger zooplankton and detritus. Each BOD bottle was allowed to overflow at least once. The capped BOD bottles were placed on ice in the dark to reduce productivity and respiration of phytoplankton until lab processing could begin. A 100-milliliter water sample was collected at each location to determine alkalinity, and background samples (for primary productivity) were collected at random from four stations. These samples, two replicates per location, were also placed on ice in the dark.

b. Laboratory Processing

1) Phytoplankton Density

At the field laboratory, the phytoplankton density samples were settled in aluminum-covered glass settling chambers for 24 hours (Weber 1973). Each sample consisted of about 2 liters of thoroughly mixed sample placed in an individual chamber with one drop of dishwashing detergent. After each sample had settled, approximately 1800 milliliters of the cell-free water was drawn off with a vacuum pump and the remaining 200 milliliters centrifuged at 2000 rpm for 12 minutes until a small pellet of organisms remained. All except 10 milliliters of the centrifuged sample was drawn off. The pellet was then resuspended into the remaining volume and emptied into a 8-dram glass vial. Then, 3 to 4 milliliters of a solution of three parts 95 percent ethanol and one part formalin was added as a final preservative.

Phytoplankton identification and enumeration was performed at 400X magnification using a Palmer cell (APHA 1976) and 20 randomly picked fields (10 fields per subsample).

2) Chlorophyll a Concentration

Filtration of water samples to determine the chlorophyll a concentration was initiated immediately after return from the field. Between 500 and 2000 milliliters were filtered through a Whatman GF/A glass fiber filter at approximately 15 pounds per square inch. Before the last 50 milliliters of the

sample was filtered, 1 to 2 milliliters of saturated magnesium carbonate ($MgCO_3$) solution was added. The filter was folded carefully, with the plankton to the inside, and was placed into an 8-dram glass vial and frozen at -18°C (0°F).

Chlorophyll was extracted from the filter using 90 percent acetone and allowed to stand for 24 hours in a darkened refrigerator at 4-8°C. The extracted chlorophyll was then placed into a Beckman Model 26 spectrophotometer using a 5-centimeter path-length spectrophotometer cell, and extinction values were measured at 665 microns and 750 microns. Next, two drops of 50 percent hydrochloric acid were added to the cell, the contents were agitated, and extinction values were measured again at 665 microns and 750 microns for the degradation product, phaeophytin a. The mathematical conversion of extinction values to chlorophyll a concentrations is presented in the discussion of data reduction that follows (subsection c).

3) Primary Productivity

Upon their return to the field laboratory, all light and dark bottles were inoculated with 5 microcuries of radioactive carbon (^{14}C) in the form of sodium bicarbonate. After the radioactive material was added, the bottles were inverted several times and placed in an incubator at ambient lake surface temperature under a fluorescent light at approximately 200 foot-candles for 4 hours. At the end of the 4 hours, samples were fixed with 1 milliliter of neutral full-strength formalin to stop all production. Each sample was then filtered slowly through a Gelman membrane filter composed of a blend of nitrocellulose and cellulose acetate. After all excess liquid was drawn through the filter, it was removed using forceps and placed into a scintillation vial to which was added 2 milliliters of Soluene-350 solubilizer (Parkard Instruments). After 1 hour at room temperature (20 to 22°C), 10 milliliters of Dimilume-30 fluor (Packard Instruments) was added to the vial and the vial sealed and labeled.

Primary productivity samples were analyzed with liquid scintillation techniques using a Beckman LS-250 scintillation counter. Counts per minute were used to calculate primary productivity values according to the formula presented in the data reduction discussion that follows. Sample disposal was according to established procedures for handling radioactive material.

c. Data Reduction

1) Phytoplankton Density

Densities (number per milliliter) of individual taxa and major summary groups (divisions) were calculated for each sample.

Mean density of two replicate samples from the same location on the same date were calculated with the following estimators:

$$\text{Density of sample} = \frac{x}{f} \cdot \frac{s}{V} \tag{1}$$

where

x = number of organisms within the microscopic fields (or aliquot analyzed)

f = total volume of the microscopic fields (or aliquot analyzed)

s = volume of lab sample

V = total volume of lake water sampled

and

$$\text{Mean density at specific location} = \frac{(d_1+d_2+\ldots d_x)}{r_x} \tag{2}$$

where

d = density of replicate

r = number of replicates

The standard error of the means of replicate samples (Snedecor and Cochran 1967) was calculated to indicate variation between replicates using the following estimator:

$$\text{Standard error} = \frac{|D_1-D_2|}{2} \tag{3}$$

where

D_1 = density in replicate 1

D_2 = density in replicate 2

To indicate the temporal and spatial distributions of the phytoplankton, each taxon's mean density was calculated by individual sampling periods for the site (all stations combined), specific contour, and area (experimental or control) using the following estimator:

$$\text{Mean density} = \frac{\sum_{i=1}^{n} d_i}{n} \qquad (4)$$

where

d_i = density for i^{th} location
n = number of locations sampled

The variation among phytoplankton densities at the sampling locations was determined by calculating standard errors of the contour means, the control and experimental area means, and the site means using the following estimator for each summary group:

$$\text{Standard error} = \sqrt{\frac{\sum_{i=1}^{n} d_i^2 - \frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}}{n\ (n-1)}} \qquad (5)$$

where

d_i = density for i^{th} location (or i^{th} replicate)
n = number of station locations sampled (or number of replicates)

The formula assumed that selected stations, contours, and control and experimental areas were approximately equivalent to randomly selected stations, contours, and control and experimental areas.

2) Chlorophyll a Concentration

Each sample's concentrations of chlorophyll a and phaeophytin a were derived using extinction values (spectrophotometer readings) for acidified and unacidified samples. Individual sample concentrations were calculated using

equations provided by Strickland and Parsons (1972), and values were reported as micrograms per liter.

$$\text{Chlorophyll } \underline{a} = \frac{26.7\ (665_o - 665_a) \times v}{V \times \ell} \qquad (6)$$

$$\text{Phaeophytin } \underline{a} = \frac{26.7\ (1.7[665_a - 665_o]) \times v}{V \times \ell} \qquad (7)$$

where

665_a = extinction at 665 millimeter after acidification

665_o = extinction at 665 millimeter before acidification

v = volume of acetone used for extraction (milliliters)

V = volume of water filtered (liters)

ℓ = cell path length (centimeters)

Equations 2 and 3 were used to calculate the mean concentration and standard error, respectively, at each location. Equations 4 and 5 were used to calculate the means and standard errors of the contours, control and experimental areas, and site.

3) Primary Productivity

Primary production was calculated using the following equation and was reported as milligrams of carbon assimilated per cubic meter during the incubation period:

$$\text{Production} = \frac{(cpm_L - cpm_D)\left(\frac{\text{volume of bottle}}{\text{volume filtered}}\right)}{\text{Stock cpm}} \cdot (1000)\ (IC)\ (1.06) \qquad (8)$$

where

Production = amount of carbon assimilated per volume per unit time

cpm_L = counts per minute of light bottle

cpm_D = counts per minute of dark bottle

Stock cpm = counts per minute determined from stock solution

IC = available carbon as determined using bicarbonate alkalinity values (micrograms per liter)

The 1.06 in Equation 8 represents the factor accounting for the isotopic effect of carbon.

2. Zooplankton

Zooplankton and animal plankton are at an intermediate stage in the food web; i.e., they feed upon phytoplankton or other zooplankton and are fed upon by larger organisms. Most zooplankton, like phytoplankton, cannot sustain mobility against water currents.

a. Field Sampling

A Wisconsin net having a diameter of 12 centimeters, a mesh of 76 microns, and length-to-mouth diameter ratio of 3 to 1 was used to sample. An electronic flowmeter was towed alongside the boat to determine towing speed; it was checked frequently via a readout in the boat cabin and was calibrated each month.

To collect duplicate microzooplankton samples, simultaneous oblique tows were made with two nets towed for 2 to 4 minutes at a velocity of 1.0 to 1.5 meters per second. Four depth contours along the NMPW, NMPP, FITZ, and NMPE transects were sampled (Figure III-1 and Table III-1). Sampling was monthly during the day, and surface and bottom temperatures were recorded at the end of each tow.

Microzooplankton samples were fixed with a rose bengal stain/acid Lugol's solution and 15 minutes later were preserved with the addition of buffered formalin to achieve a 10 percent formalin concentration.

Larger zooplankton (macrozooplankton) were collected using a Hensen net having a diameter of 1 meter, a mesh of 571 micrometers, and length-to-mouth diameter ratio of 6 to 1. A digital flowmeter mounted in the center of the net mouth provided sample volume data, while an electronic flowmeter determined towing velocity. Macrozooplankton were collected once per month during the day (usually the second week) in conjunction with ichthyoplankton sampling by

horizontally towing the Hensen nets at subsurface, mid-depth, and off bottom at the locations indicated in Figure III-1 and Table III-1. The nets were towed for 5 minutes at a velocity of 1 meter per second. At each sampling location, surface and bottom temperatures were taken. If the difference between the two was more than 2°C, a mid-depth temperature was also taken.

b. Laboratory Processing

The two microzooplankton samples from each location were composited prior to laboratory processing, and two subsamples were removed from each composite sample for density analysis. The samples were mixed thoroughly. An aliquot was withdrawn using a wide-bore pipette and was placed in a Sedgewick-Rafter cell. All microzooplankton within five strips of each chamber for three Sedgwick-Rafter chambers (cells) were identified to the species level whenever practical and enumerated at 100X magnification. Densities were reported as number per cubic meter. Additional strips were counted if necessary to obtain a 200-organism minimum.

Macrozooplankton densities were determined using ichthyoplankton samples. After the ichthyoplankton in subsurface, mid-depth, and off-bottom samples had been analyzed, the three depth samples were composited into one sample for each location and the composited sample split in half using a modified Folsom splitter. Each fraction was analyzed within a gridded petri dish. Macrozooplankton were identified to the species level whenever practical, and data were recorded as organisms per cubic meter.

c. Data Reduction

Individual taxon densities in each microzooplankton or macrozooplankton sample were calculated. Equation 2 (subsection A.1.c) was used to calculate the mean density for the two replicate microzooplankton samples collected at each location, and Equation 3 (subsection A.1.c) was used to determine the standard error of the mean density of these replicates. The densities of each major group were obtained from the sums of the mean densities of each taxon within the group, while total densities (all taxa combined) were obtained by summing group densities.

Temporal and spatial distributions of zooplankton (either micro- or macrozooplankton) were determined by calculating contour, site, and experimental and control area mean densities for individual sampling periods using Equation 4 (subsection A.1.c). To indicate variation among densities at these locations, standard errors were calculated using Equation 5 (subsection A.1.c).

3. Periphyton

For the purposes of density estimation, periphyton is defined as the assemblage of algae growing on surfaces of submerged objects. The species composition of this sessile community can provide important information relative to the quality of the aquatic environment. For the purposes of biomass determination, periphyton is defined as organisms, including algae and smaller invertebrates, present on the surface of colonization slides.

a. Field Sampling

Periphyton were collected monthly in the vicinity of Nine Mile Point on Lake Ontario using 51.6-square centimeter plexiglass slides. Collections from the artificial substrates were used to determine seasonal patterns, community composition, and spatial distribution of periphyton. Bottom samples were from five depth contours on the NMPW, NMPP, FITZ, and NMPE transects (Figure III-1 and Table III-1). In addition, samplers were suspended at depths of 2, 7, 12, and 17 feet along the 40-foot contour on the NMPW, NMPP, and FITZ transects. Four plexiglass slides for bottom periphyton samples and two slides for suspended periphyton were placed into position at each location each month and harvested approximately 30 days later. Bottom periphyton samples were collected from May, through December, while suspended periphyton samples were collected from May through September. Periphyton samples were scraped from both sides of each substrate, placed in individual vials, fixed with 1 percent acid Lugol's solution, and preserved with 10 percent buffered formalin.

b. Laboratory Processing

Periphyton were identified and enumerated in a Sedgwick-Rafter cell at 200X magnification. Sample vials were inverted several times to gently homogenize the samples just before their transfer to the Sedgwick-Rafter cell. Randomly chosen fields were analyzed until 200 organisms had been counted.

Density was reported as number of cells per square centimeter of substrate surface.

To obtain biomass data, samples were dried at 105°C for 36 hours (or until a constant weight had been attained) and then were cooled in a desiccator for 2 hours before being weighed to the nearest 10^{-5} gram on an analytical balance. Then, the dried samples were heated for 0.5 hour in a muffle furnace at 500°C, cooled in a desiccator for 2 hours, and reweighed to the nearest 10^{-5} gram. The difference in weight represented the ash-free dry weight of periphyton (all species combined) per square decimeter.

c. Data Reduction

The density of each taxon identified was calculated using the following estimate:

$$\text{Density (No./cm}^2) = \frac{n}{s} \cdot \frac{v}{a} \qquad (9)$$

where

n = number of specimens in each taxon within aliquot

s = volume of aliquot enumerated

v = volume of sample

a = area of slide surface (51.6 cm^2)

Total biomass was calculated using the following equation:

$$\text{Total biomass (mg/dm}^2) = \frac{\text{Total ash-free dry weight}}{\text{Area of slide (51.6 cm}^2)} 100 \qquad (10)$$

Mean densities and the mean total biomass for each location were calculated using Equation 2 (subsection A.1.c). The density of each major group was obtained from the sums of the mean densities of the taxa within a group, and total density was obtained from the sums of the major groups.

Equation 3 (subsection A.1.c) was used to estimate the standard error of the mean of replicate suspended periphyton samples, and Equation 5 (subsection A.1.c) was used to estimate the standard error of bottom periphyton.

Trends in temporal and spatial distribution were examined from the mean densities (from Equation 4) for specific contours, the entire site, and the experimental and control areas. The standard errors of these mean densities were calculated using Equation 5.

4. Benthic Invertebrates

a. Field Sampling

Benthic macroinvertebrates live part or all of their life cycle within or upon available substrates in the aquatic environment. These consumers, like zooplankton, are at an intermediate stage in the food web.

To sample benthos in the Nine Mile Point area, a scuba diver used a self-contained, 0.166-square-meter submersible suction sampler similar to that described by Gale and Thompson (1975).

Duplicate benthic samples were collected every 2 months from the substrate present at 20 stations (Figure II-1 and Table III-1), and attempts were made to sample the same substrate from month to month. Bottom water temperature was taken at each station.

Samples were washed in the field on a U.S. Standard No. 30 sieve (590-micrometer mesh) and were preserved with buffered formalin.

b. Laboratory Processing

In the laboratory, samples were sieved through a U.S. Standard No. 35 (500-micrometer mesh) to supplement field sieving and wash off the formalin. Then the benthic organisms were separated from the remaining debris and placed in vials of 70 percent ethanol. All benthic organisms were subsequently identified to the lowest practical taxon and enumerated using a dissecting microscope.

To obtain the wet-weight biomass, major taxa organisms of a particular group were emptied from their vial, blotted to remove excess moisture, and

weighed immediately to the nearest 0.1 milligram. Biomass was reported in grams per square meter. A group of only a few individuals in a sample was combined with the same group from the replicate sample or with individuals from stations along the same depth contour if necessary to obtain a sufficient number for weight determination.

The density or biomass of benthic invertebrates in each sample was calculated using the following equation:

$$\text{Sample density (or biomass)} = \frac{\text{Number (or weight) or organisms}}{\text{Cross-sectioned area of sampler}} \quad (11)$$

Then, the mean density or biomass at each station was derived using Equation 2 (subsection A.1.c). The density of each major group was obtained from the sums of the mean densities of the taxa within the group, and group densities were summed to obtain total densities (all taxa combined).

To determine temporal and spatial distributions of the benthic invertebrates, mean densities and associated standard errors were calculated by sample periods for the entire site, various depth contours, and control and experimental areas using Equations 4 and 5 (subsection A.1.c).

5. Ichthyoplankton

Ichthyoplankton are the early developmental stages (eggs and larvae) of fish. The larvae of most fish species are planktonic (drifting or suspended in water) while the eggs are either planktonic or demersal (heavier than water).

a. Field Sampling

Ichthyoplankton samples were collected from subsurface, mid-depth, and off-bottom strata using the same sampling techniques and locations (Figure III-1 and Table III-1) as described for macrozooplankton sampling (subsection 2). Weekly sampling included one horizontal tow at each depth strata at all stations. Sampling, which began in early April, was during the day for the first 2 months and then during the day and night from June through mid-September. Weekly day sampling continued through November. In December, samples were collected twice per month.

b. Laboratory Processing

Ichthyoplankton samples were strained with a 300-micron screen to remove silt and preservative. The following definitions were established for life stages:

Egg	Prior to hatching
Prolarvae	From time of hatching until absorption of the yolk sac (yolk-sac larvae).
Postlarvae	From time of yolk-sac absorption until acquisition of fin-ray complement, body form, and pigmentation of an adult (post yolk-sac larvae).

If there were more than 400 specimens per sample, the sample was divided into two aliquots with a modified Folsom plankton splitter (Lewis and Garriett 1970). The larger debris were removed prior to splitting and splitting continued until about 200 fish eggs and larvae remained in the reduced portions. The whole sample or aliquot was examined and the ichthyoplankton separated by life stages. Each life stage was identified to species when possible and enumerated. Juvenile (the life stage following postlarvae) fish were not considered to be ichthyoplankton because they are free-swimming organisms.

c. Data Reduction

The density of each species collected at each depth strata was calculated using Equation 1 (subsection A.1.c) and reported as number of eggs, prolarvae, or postlarvae per 1000 cubic meters of water sampled. A mean density for each sampling station (subsurface, mid-depth, and off-bottom depth strata combined) and a mean density for each depth strata along the 20- and 40-foot depth contours were calculated using Equation 2. The station mean densities were averaged to obtain mean densities for the 20- and 40-foot depth contours and a site density. Since there was only one station each at the 60-, 80-, and 100-foot depth contours, the station mean density at these locations was equivalent to the contour mean density.

6. Fisheries

The fish population in the vicinity of Nine Mile Point includes both primary and secondary consumers. Fish represent the higher consumer levels

in the aquatic ecosystem and provide the base for the sport and commercial fishing industries.

a. Field Sampling

Adult and juvenile fish populations in the Nine Mile Point study area were sampled with a variety of gear to reduce the selectivity that is inherent in the use of only one gear. Gear types included experimental gill nets, bottom trawls, beach seines, and trap nets.

The experimental gill nets were 8 feet deep and have six 25-foot-long panels. Mesh sizes of the panels ranged from 0.5 to 2.5 inches bar measure.

Gill net sets were made twice monthly from April through December at 19 locations. The nets were set parallel to shore around sunrise or sunset and harvested at approximately 12-hour intervals for 24 or 48 hours (Table III-1), the exception being at stations located on the 6.1-meter (20-foot) depth contour, where they were set for 24 hours. As each net was harvested at each sampling location, bottom water temperatures were recorded.

Two types of bottom trawls were used in the Nine Mile Point vicinity: the flat otter trawl and a three-quarter standard Yankee trawl. The otter trawl had 1-inch mesh wings and body. The cod end was equipped with a 0.25-inch mesh liner. This trawl had a 30-foot footrope, a 27-foot head rope, and a vertical mouth opening of 6 feet. The Yankee trawl had 1.75-inch mesh wings and a 1.25-inch mesh body with a 0.25 inch mesh cod end. The mouth opening of this trawl net was approximately 8 x 20 feet.

The otter trawl was used at most locations; on the NMPE transect at the 40- and 60-foot depth contours, however, the absence of obstructions (large boulders) permitted the use of the larger Yankee trawl. Yankee trawl data were not directly comparable to otter trawl data.

Day trawling began approximately 2 hours after sunrise, night trawling about 2 hours after sunset. Trawls were towed parallel to the shoreline along the respective depth contour at 1 meter per second for approximately 15 minutes. Bottom water temperatures were taken with each sample.

The 50-foot beach seine was 8 feet deep with a bunt or pocket of 0.25-inch mesh nylon centered between wings of the same mesh. A brail was attached to each end of the net to maintain maximum separation between the lead and float lines during the seine haul.

A small boat was used to deploy the beach seine parallel to and 100 feet offshore and then the wings were hauled simultaneously toward shore with ropes, forcing the catch into the bunt. Surface water temperatures were taken 100 feet offshore at each seine location.

Beach seines were hauled twice each month during daylight hours from April through December (Table III-1). Shoreline samples were taken at the following four locations:

- NMPW transect: 10 yards west of a creek
- NMPP transect: approximately 10 yards west of the storm-drain discharge pipe by the Nine Mile Point Visitors Center
- FITZ transect: on the small pebble beach by the James A. FitzPatrick power station
- NMPE transect: at the base of Shore Oaks Road

Trap nets were used in this study to supplement data collected with the gill nets, trawls, and seines. The box trap had 0.25-inch mesh nylon netting supported on a 3- x 3- x 6-foot aluminum pipe frame. The box trap had 25-foot wings and a 50-foot center lead. The trap was deployed on the lake bottom at the 20-foot contour with the lead stretched perpendicular to the shoreline and the wings set at 45° angles to the lead.

The trap nets were set twice monthly from mid-May through December on transects NMPW, NMPP, FITZ and NMPE (Table III-1) around sunset and were picked up shortly after sunrise.

After being removed from the nets, the fish were preserved in 10 percent buffered formalin for later processing. During the expected spawning season of several select species (alewife, rainbow smelt, white perch, yellow perch, and smallmouth bass), there were checks to see if either milt or eggs could be

stripped from the gonads to indicate that spawning was progressing. All fish selected for analysis of stomach contents were injected with 10 percent formalin (through the body wall into the stomach and through the mouth into the pharynx) to abate gastric digestion.

b. Laboratory Processing

1) General Analyses

All fish were identified to the species level and enumerated. Total lengths (millimeters) and total weights (grams) were determined for a maximum of 40 individuals per species per catch. Three key species (white perch, yellow perch, and smallmouth bass) were further processed to determine age, stomach contents, and coefficient of maturity. Gonads from these key species as well as from rainbow smelt and alewife were removed and used to estimate fecundity.

The sex and the stage of sexual maturity were determined for individuals of the three key species to supplement the age and coefficient-of-condition and maturity data. The following definitions were used for sex and sexual maturity:

<u>Sex</u>	
Male	Presence of testes
Female	Presence of ovaries
Hermaphrodite	Presence of both testes and ovaries
Unable to sex	Poorly preserved; damaged; gonads atropied
Undifferentiated	A young specimen with gonads not yet committed as either testes or ovaries
<u>Stages of Maturity</u>	
Immature	A specimen which is either male or female but is too young to spawn (subadult)
Resting mature	An adult specimen out of spawning season
Gravid (maturing)	An adult specimen heading into the spawning season. Testes and ovaries are opaque, light-colored to reddish white (ovaries may appear orange) and

	occupy about half or more of body cavity. Eggs are granular, whitish or orange-reddish, and visible to the naked eye.
Ripe or running	An adult specimen usually in peak spawning condition. Sexual organs literally fill the body cavity. Testes are white, and drops of milt can be extruded with pressure. Eggs are completely round, may be translucent to opaque, and may be extruded by applying pressure.
Spent	An adult specimen after spawning. The sexual products have been discharged. The gonads have the appearance of deflated sacs and there are usually a few remaining eggs (in a state of reabsorption) in the ovaries, and some residual sperm in the testes.
Unable to determine	Self-explanatory

2) Coefficients of Condition and Maturity

Coefficients of condition and maturity were calculated by sex for yellow perch, white perch, and smallmouth bass subsampled from gill net catches. If available, 50 males and 50 females of each species were obtained each month from the experimental area (NMPP and FITZ) and from the control area (NMPW and NMPE).

3) Fecundity

During the spring spawning season (April through June), there was an attempt to collect gonads from 25 gravid females of five species (alewife, rainbow smelt, yellow perch, white perch, and smallmouth bass) for estimating fecundity. Females of several different sizes were used so results would not be biased toward larger or smaller fish.

Fecundity, defined as the number of ripening ova in a female prior to spawning (Ricker 1971), was determined using a gravimetric (for yellow perch, white perch, and smallmouth bass) or volumetric (for rainbow smelt and alewife) procedure. The eggs within a subsample removed from the middle of the ovary were counted (both immature and mature eggs were counted for alewife and white

perch), then this number was multiplied by a factor representing the ratio between, subsample volume (or weight) and total gonad volume (or weight). For the gravimetric procedure, the subsample represented about 1 percent of the total ovary; for the volumetric procedure, about 5 percent of the total ovary. Ova in the following size (diameter) classes were enumerated:

Alewife	0.5-0.8 mm (and 0.2-0.4 mm)
White perch	0.5-0.9 mm (and 0.2-0.4 mm)
Rainbow smelt	0.4-1.1 mm
Smallmouth bass	1.2-2.5 mm
Yellow perch	0.6-1.5 mm

The percentage of the total number of ova in each size category was determined by measuring the diameters of 50 randomly selected ova with an ocular micrometer.

4) Age

Scales were removed from individuals of the three key species and were analyzed. Fifty fish were taken from samples collected in the area potentially affected by the thermal plumes of the two plants (transects NMPP and FITZ), while another 50 were from the transects farthest from the power stations (NMPW and NMPE). Fish selected for age analysis were distributed over the size classes present in the Lake Ontario population.

Scales of yellow perch and smallmouth bass were removed from the left side below the lateral line at the distal tip of the depressed pectoral fin (Lagler 1956). Scales of white perch were removed from the left side above the laterial line and below the gap between the spinous and softrayed dorsal fins (Mansueti 1960).

To prepare the scales for analysis, wet mounts or cellulose acetate impressions were made. Annuli on the scales were identified and counted using a Tri-Simplex microprojector. All fish were considered to have been born on 1 January; therefore, fish caught between 1 January and the current year's annulus formation were aged as the number of annuli plus 1 year. After annulus formation for the current year, the age of the fish was equal to the number of annuli.

5) Stomach Contents

Knowledge of the food habits of fish is important in determining food-web interrelationships among the fish and forage components of the aquatic ecosystem.

Fish for stomach-contents analysis were captured in gill nets during August 1977 at stations along the 15-foot contour. During the month, 50 individuals of each key species (yellow perch, white perch, and smallmouth bass) were collected. As in the age studies, half of the fish were obtained from the area in the near vicinity of the power stations (NMPP and FITZ) and the other half from the two outside transects (NMPW and NMPE).

Stomach contents were teased out into a petri dish and the food items identified to the lowest practical taxon and enumerated. Quantitative data were used to determine each taxon's frequency and percentage with respect to total number of orgnaisms counted. Qualitative estimates of stomach fullness and degree of digestion were also recorded for each fish examined. To more accurately represent each food item's importance, food items were "weighted" by multiplying the individual percentage volume of each food item by the percent stomach fullness of each individual stomach. Thus, a food organism representing 50 percent of the volume in a stomach would be rated 37.5 percent in a 75 percent full stomach (i.e., 0.50 x 0.75 - 0.375). Importance indices for each species were added and the food items importance expressed as a percentage of the total food values in all stomachs.

c. Data Reduction

Catch data for the various gear were expressed as a catch per unit effort (C/f) based on the following definitions:

Beach seine	Number of individuals per seine haul
Trap net	Number of individuals per overnight set
Trawl	Number of individuals per 15-minute tow
Gill net	Number of individuals per gill net set standardized to a 12-hour set

The gill net C/f, for example, was estimated as:

$$\text{Gill net C/f} = \frac{(x_i)\ (12)}{T_1} \tag{12}$$

where

x_i = number of fish caught in i^{th} sample
T_1 = duration of set in hours

Fecundity estimates for each fish were calculated using the equation:

$$\text{Fecundity} = \frac{N \cdot W_1}{W_2} \tag{13}$$

where

N = number of ova in subsample
W_1 = weight or volume of both right and left ovaries
W_2 = weight or volume of subsample

Aged fish were grouped by area of capture (experimental or control) and by age class. Mean total length for each age class was calculated using the equation:

$$\overline{X} = \frac{\sum_{i=1}^{n} x_i}{N} \tag{14}$$

where

N = number of fish
x_i = value of i^{th} fish

Coefficients of maturity for the three key species were expressed as the simple percentage of gonad weight to total body weight. Maturity values were grouped by sex (male or female), month, and location of capture (experimental or control area), and an average value was calculated using Equation 14.

Length and weight data for individuals of the three key species were grouped by sex (male or female), season (spring, summer, fall), and location of capture (experimental or control area). For each group, length-weight relationships were calculated from the logarithms (base 10) of the lengths and weights using the equation:

$$\log W = \log \alpha + \beta \log (TL) \quad (15)$$

where

W = weight in grams

α and β = empirically derived constants

TL = total length in millimeters

Condition factors (K) also were calculated for these same groups of fish using the equation:

$$K_{(TL)} = \frac{W \times 10^5}{L^3} \quad (16)$$

where

W = weight in grams

L = total length in millimeters

Condition factors were averaged for each group using Equation 14.

7. Water Quality and Thermal Profiles

The water quality sampling program was developed to monitor water quality in the vicinity of the two operating power plants. A 9-liter PVC Van Dorn water bottle was used to collect samples for general chemical analyses. For tasks such as coliform bacteria and biochemical oxygen demand (BOD), specialized techniques (described below) were used. Holding times, required preservatives, and analytical methods are indicated in Tables III-2 and III-3.

Table III-2

Recommended Sampling and Preservative Methods and Analysis Locations for Water Quality Samples Collected at Nine Mile Point and James A. FitzPatrick Plants on Lake Ontario

Group	Parameter	Volume Required (mℓ)	Collection: Container Material†	Collection: Preservative	Holding Time*	Analysis Location
III	Alkalinity	100	P,G	4°C	24 hr	Field
II,III	BOD_5	1000	P,G	4°C	6 hr	Field
II,III	COD	50	P,G	H_2SO_4	7 days	Dallas
I,II,III	Total solids	100	P,G	None	7 days	Dallas
III	Total dissolved solids	100	P,G	4°C	7 days	Dallas
I,II,III	Total suspended solids	100	P,G	4°C	7 days	Dallas
III	Total volatile solids	100	P,G	4°C	7 days	Dallas
II,III	Total Kjeldahl nitrogen	500	P,G	4°C,H_2SO_4	24 hr	Dallas
II,III	Ammonia nitrogen	400	P,G	4°C,H_2SO_4	24 hr	Dallas
II,III	Nitrate nitrogen	100	P,G	4°C,H_2SO_4	24 hr	Dallas
I,II,III	Total phosphorus	50	P,G	4°C	7 days	Dallas
III	Color	50	P,G	4°C	24 hr	Dallas
II,III	Specific conductance	100	P,G	4°C	24 hr	Field
III	Total coliform bacteria	100	G	4°C	6 hr	Subcontract
III	Fecal coliform bacteria	100	G	4°C	6 hr	Subcontract
III	Organic nitrogen	500	P,G	4°C,H_2SO_4	24 hr	Dallas
II,III	Orthophosphate	50	P,G	4°C	24 hr	Dallas
I, III	Sulfate	50	P,G	4°C	7 days	Dallas
III	Chloride	50	P,G	None	7 days	Dallas
III	Aluminum	100**	P,G	HNO_3	6 mo	Dallas
III	Cadmium	100**	P,G	HNO_3	6 mo	Dallas
I, III	Calcium	100**	P,G	HNO_3	6 mo	Dallas
I, III	Chromium	100**	P,G	HNO_3	6 mo	Dallas
III	Copper	100**	P,G	HNO_3	6 mo	Dallas
III	Beryllium	100**	P,G	HNO_3	6 mo	Dallas
III	Iron	100**	P,G	HNO_3	6 mo	Dallas
III	Lead	100**	P,G	HNO_3	6 mo	Dallas
III	Magnesium	100**	P,G	HNO_3	6 mo	Dallas
III	Mercury	100**	P	HNO_3	13 days	Dallas
III	Nickel	100**	P,G	HNO_3	6 mo	Dallas
III	Potassium	100**	P,G	HNO_3	6 mo	Dallas
I, III	Sodium	100**	P,G	HNO_3	6 mo	Dallas
III	Zinc	100**	P,G	HNO_3	6 mo	Dallas
III	Phenols	500	G	4°C,H_3PO_4 1.0 g $CuSO_4$	24 hr	Dallas
III	Vanadium	100*	P,G	HNO_3	6 mo	Dallas
II,III	Silica	50ℓ	P	4°C	7 days	Dallas
III	ABS	250	P,G	4°C	24 hr	Dallas
III	Arsenic	100**	P,G	HNO_3	6 mo	Dallas
III	Barium	100**	P,G	HNO_3	6 mo	Dallas
III	Carbon chloroform extract	60ℓ	G	None	48 hr	Dallas
III	Cyanide	500	P,G	4°C,NaOH	24 hr	Dallas
III	Fluoride	300	P,G	4°C	7 days	Dallas
III	Manganese	100	P,G	HNO_3	6 mo	Dallas
III	Selenium	100	P,G	HNO_3	6 mo	Dallas
III	Ferro- and ferricyanide	500	P,G	4°C,NaOH	24 hr	Dallas
III	Silver	100	P,G	HNO_3	6 mo	Dallas
II,III	Turbidity	100	P,G	4°C	7 days	Field
II	CO_2	500	G	4°C	6 hr	Field
I, III	Radioactivity	8ℓ	P,G	None	6 mo	Subcontract
I,II	pH	In situ				Field
I,II	Temperature	In situ				Field
I,II	Dissolved oxygen	In situ				Field

†P = plastic, G = glass
*Samples properly preserved may be held for extended periods beyond recommended holding time.
**One 100-mℓ sample preserved with HNO_3 is sufficient sample for all metals.

Table III-3

Analytical Methods and Detection Limits for Selected Physicochemical Parameters

Parameter	Method	Reference*	Detection Limits
Temperature	Thermistor	SM 162	0.1°C
Dissolved oxygen	Polarographic probe (in situ)	EPA p. 56	0.1 mg/ℓ
Specific conductance (salinity)	Wheatstone bridge	SM 154	5 µmhos
Turbidity	Nephelometric	SM 163A	1 FTU
pH	Electrometric (in situ)	SM 144A	0.01 units
Alkalinity	Electrometric titration	SM 102	0.1 mg/ℓ
Total dissolved solids	Gravimetric (105°C)	SM 148B	1 mg/ℓ
Total suspended solids	Glass-fiber filter (103-105°C)	SM 148C	0.1 mg/ℓ
Color	Automated (APHA)	SM 118	5 APHA
Total organic carbon	Dohrman Model DC-50	EPA p. 73	1.0 mg/ℓ
Ammonia nitrogen	Automated (phenolate)	EPA p. 168	0.002 mg/ℓ
Nitrate nitrogen	Automated (cadmium reduced)	EPA p. 201	0.02 mg/ℓ
Nitrite nitrogen	Automated (diazo)	EPA p. 215	0.002 mg/ℓ
Organic nitrogen	Manual (digestion distillation), automated digestion phenolate	EPA p. 182	0.03 mg/ℓ
Total inorganic phosphate	Digestion (acid) + automated	EPA p. 256	0.002 mg/ℓ
Total phosphate	Digestion (persulfate) + automated	EPA 1. 256	0.002 mg/ℓ
Sulfide	Automated	EPA p. 280	0.005 mg/ℓ
Silica	Automated (molybdosilicate method)	EPA p. 281	0.05 mg/ℓ
Biochemical oxygen demand	Polarographic probe	EPA p. 11	0.1 mg/ℓ
Total coliform bacteria	Multiple tube fermentation	SM 408D	--
Fecal coliform bacteria	Multiple tube fermentation	SM 408C	--
Sulfates	Automated (barium, chloranilate)	EPA p. 279	0.2 mg/ℓ
Chlorides	Titration (mercuric nitrate), automated		
Hardness	EDTA titrimetric	SM 122B	0.1 mg/ℓ
Surfactants	Methelene blue method	SM 159A	0.01 mg/ℓ
Phenols	4-aminoantipyrine method	EPA p. 256	0.005 mg/ℓ
Oil and grease	Trichloratrifluoroethane extraction	EPA p. 229	0.1 mg/ℓ
Aluminum	Atomic absorption	SM 129A	0.001 mg/ℓ
Beryllium	Atomic absorption	SM 123A	0.001 mg/ℓ
Boron	Carmine method, automated	SM 107B	0.1 mg/ℓ
Cadmium	Atomic absorption	SM 109A	0.001 mg/ℓ
Calcium	Atomic absorption	EPA p. 103	0.002 mg/ℓ
Chromium	Atomic absorption	SM 117A	0.001 mg/ℓ
Cobalt	Atomic absorption	SM 116A	0.001 mg/ℓ
Copper	Atomic absorption	SM 119A	0.001 mg/ℓ
Cyanide	Pyridine-pyrazalone method	SM 207C	0.005 mg/ℓ
Fluoride	Ion selective electrode	EPA p. 61	0.04 mg/ℓ
Iron	Atomic absorption	EPA p. 147	0.001 mg/ℓ
Lead	Atomic absorption	SM 125B	0.001 mg/ℓ
Magnesium	Atomic absorption	SM 127B	0.0001 mg/ℓ
Manganese	Atomic absorption	SM 128A	0.001 mg/ℓ
Molybdenum	Atomic absorption	EPA p. 139	0.03 mg/ℓ
Nickel	Atomic absorption	EPA p. 141	0.005 mg/ℓ
Potassium	Flame emission	SM 147A	0.005 mg/ℓ
Selenium	Atomic absorption	EPA p. 145	0.0003 mg/ℓ
Sodium	Flame emission	SM 153A	0.0007 mg/ℓ
Titanium	Atomic absorption	EPA p. 143	0.001 mg/ℓ
Tin	Atomic absorption	EPA p. 143	0.001 mg/ℓ
Vanadium	Atomic absorption	EPA p. 144	0.001 mg/ℓ
Zinc	Atomic absorption	SM 165A	0.001 mg/ℓ
Pesticides	Gas chromotography	EPA	--
Radioactivity	Gas-flow proportional counter, scintillation counter, and gamma spec.	RMC	--

*ASTM - Annual Book of ASTM Standards, Part 31 Water. American Society for Testing and Materials. Philadelphia.

SM - Standard Methods for the Examination of Water and Wastewater, 14th ed., 1976, APHA, AWWA, WPCF.

EPA - Methods for Chemical Analysis of Water and Wastes, 1976a, and various technical leaflets.

RMC - Radiation Management Corporation Analytical and Quality Control Procedures, RMC-TM-75-3, July 1976

Sampling regimes for the FitzPatrick and Nine Mile Point water quality tasks required different parameters and frequencies. For convenience, the sampling regimes were categorized into three groups.

a. Group I

Water samples were collected monthly at the 20- and 40-foot depth contours on the NMPW, FITZ, and NMPE transects and examined for the 11 parameters specified in Table III-2. Whole-water samples were collected from 0.5 meter below the surface in a 9-liter PVC Van Dorn water bottle, then dispensed into polyethylene containers and placed on ice. Temperature, dissolved oxygen (D.O.), and pH were determined in situ with a Yellow Springs Instruments (YSI) Model 57 D.O. meter and an Instrumentation Laboratories (IL) Model 175 Portomatic pH meter (or equivalent instruments). With the exception of radioactivity samples which were analyzed by Radiation Management Corporation (RMC 1976), samples were sent airfreight to Dallas and analyzed according to techniques described in Tables III-2 and III-3.

b. Group II

Samples were collected at the 20- and 60-foot depth contours of the NMPW, NMPP, and NMPE transects and were examined for the 16 parameters specified in Table III-2, as well as for chlorophyll a concentrations. Whole-water samples were collected from the 0.5-meter depth in a 9-liter PVC Van Dorn water bottle, then dispensed into polyethylene containers and placed on ice. Temperature, dissolved oxygen, conductivity, and pH were measured in situ. Free carbon dioxide was determined with standard titration techniques. Samples for BOD analysis were placed in sterilized glass BOD bottles, which were allowed to overflow at least three times their volume. The BOD samples were placed on ice in the dark, and incubation was begun within 6 hours. Turbidity was determined at the field lab with a Hach Model 2100A turbidimeter. Chlorophyll a samples were prepared according to methods described in subsection A.1.b, then frozen and shipped to Dallas, along with the remaining Group-II parameters for analyses (Table III-3).

c. Group III

Water quality samples were collected monthly from April through December along the NMPP/FITZ transect. Whole-water samples were taken from 0.5 meter below the surface and 0.5 meter off the bottom at the 25- and 45-foot depth contours and analyzed for the 48 parameters listed in Table III-2. At each location, surface and bottom water temperatures were recorded and specific conductance measured in situ. For general water chemistry and analysis, six 1-liter polyethylene containers were filled and placed on ice. Samples for phenol determination were placed in a precleaned 500-milliliter glass container with a teflon-lined cap. Samples for BOD determination were collected as described for Group II, and water for coliform analysis was collected in sterilized glass bottles using a J-Z sampler. Incubation of coliform samples was initiated within 6 hours. Carbon chloroform extract (CCE) analysis replaced the measurement of total organic carbon in July. Sixty liters of water collected at each station and stored in glass containers were subsequently passed (for 48 hours) through a miniature CAM II-A sampler having the sample column packed with 70.0 grams of activated carbon. These activated carbon samples were then shipped to Dallas for analysis according to the method in Table II-3.

d. Thermal Profiles

Three temperature profiles were made weekly during the day from April through December. Temperatures were recorded at 1-meter intervals from surface to bottom at the 100-foot depth contour of the NMPW, FITZ, AND NMPE transects.

B. IN-PLANT STUDIES

Both the Nine Mile Point and James A. FitzPatrick power stations use once-through cooling-water systems to dissipate waste heat. Large numbers of fish could potentially be impinged on the screening devices used to remove debris from the cooling water. Since fish impingement could impact the Lake Ontario fishery, impingement rates were monitored three times a week at both power stations (Table III-4). However, planktonic organisms such as phytoplankton, zooplankton, and fish eggs and larvae pass through the screening

Table III-4

Schedule for Impingement and Entrainment/Viability Studies at Nine Mile Point and James A. FitzPatrick Power Plants, Lake Ontario, 1977

Task	Frequency*	Season	Location	Depth	Samples per Year**	Comments
Impingement						
Nine Mile Point	Three times/week (hourly on Wed)	Jan-Dec	Traveling screens and bar racks	Entire water column	156	On Mondays and Fridays, a composite 24-hr sample is collected; on Wednesdays, sampling is hourly until 24 one-hr samples are obtained.
J.A. FitzPatrick	Three times/week (D/N on Wed)	Jan-Dec	Traveling screens and bar racks	Entire water column	156	On Mondays and Fridays, a composite 24-hr sample is collected; on Wednesdays, separate day and night samples corresponding with sunrise and sunset are taken.
Entrainment						
Nine Mile Point						
Ichthyoplankton	Semimonthly† (D)	Apr-Oct	Intake forebay	2 and 7 ft below surface	28	Intake samples taken by drift nets set in forebay just upcurrent from traveling screens.
J.A. FitzPatrick						
Ichthyoplankton	Semimonthly (D/N)	Jan-Dec	Intake forebay	14 and 20 ft below surface	96	Intake samples taken by drift nets set in central area of intake.
Zooplankton	Semimonthly (D/N)	Jan-Dec	Intake forebay	5 ft below surface	96	Zooplankton samples pumped from central area of intake.
Viability						
J.A. FitzPatrick						
Phytoplankton						
Chlorophyll a	Semimonthly (D/N)	Jan-Dec	Intake, discharge, 2° and 3° ΔT samples	5 ft below surface	1536	
Primary production (^{14}C)	Semimonthly (D/N)	Jan-Dec	Intake, discharge, 2° and 3° ΔT samples	5 ft below surface	1536	Lab processing for primary production involves a larger number of samples per year because each sample is represented by one light bottle and one dark bottle.
Zooplankton	Semimonthly (D/N)	Jan-Dec	Intake, discharge, 2° and 3° ΔT samples	5 ft below surface	384	
Ichthyoplankton	Semimonthly (D/N)	Jan-Dec	Intake, discharge, 2° and 3° ΔT samples	14 and 20 ft below surface at intake; 5 ft below surface at discharge	384	

*(D) = day sampling; (N) = night sampling

**Details on sampling requirements are presented in Section II of the SOP for the Nine Mile Point Ecological Monitoring Program.

†Semimonthly is defined as twice per month.

devices and subsequently through the entire cooling-water system. This passive incorporation of planktonic organisms into a circulating water system is referred to as entrainment.

To determine the extent of and percent mortality due to entrainment, samples were taken twice monthly from the intake forebay, discharge aftbay, and thermal (discharge) plume of the James A. FitzPatrick plant and intake forebay of the Nine Mile Point Plant (Table III-4). Entrainment rates were documented by determining the number of organisms per volume of cooling water used. Viability studies, also twice monthly, were carried out at the James A. FitzPatrick plant.

To estimate the mortality caused by entrainment through the James A. FitzPatrick plant, intake and discharge samples were collected from the same water mass and the percent mortality of the two were compared. Plankton within the lake are also subject to impact, because some are entrained into the thermal discharge and exposed to higher than normal temperatures. The percentage of dead organisms in samples from a simulated or the actual discharge plume were compared to the percent mortality in the intake samples and the difference used as an estimate of mortality due to plume entrainment.

1. Impingement

a. Field Sampling

Impinged fish were collected in a large rectangular metal basket constructed of 1-inch stretch mesh hardware cloth and lined with 3/8-inch mesh nylon netting. The basket was placed at the end of the screen washwater sluice way where it dumps into the discharge canal. Fish and debris washed off the traveling screens were collected in these baskets.

Impingement sampling was conducted concurrently at both power stations (Table III-4) for a 24-hour period on Monday, Wednesday, and Friday of each week from January through December. Monday and Friday samples at both stations were cumulative 24-hour samples; the collection baskets remained in sampling position until the end of the 24-hour period. Each Wednesday, impinged fish were collected at the end of each hour throughout the 24-hour period at NMP and at the end of

day and night photoperiods at JAF. Impingement sampling generally began at 1000 (military time) on each sampling day; just before placing the fish collection basket into sampling position, the bar racks and traveling screens were cleaned and the debris and fish discarded.

Plant operational data was obtained for each sampling date to determine cooling-water flow rates, intake and discharge temperatures, and power production.

When impingement rates at either plant exceeded 20,000 fish per 24-hour period, impingement sampling was continued on a daily basis until the rate dropped below 20,000 fish per 24-hour period at the affected plant.

b. Laboratory Processing

All impinged fish were identified to species when possible and enumerated as soon as possible after collection. Total numbers and weights for each species and individual total lengths (millimeter) and weights (nearest 0.1 gram) for a maximum of 60 fish of each species from each day, night, or 24-hour sample (or for 10 individuals of each species collected in each hourly sample) were recorded. Unusual conditions (e.g., damaged individuals or presence of fish tags) were documented.

Impinged fish were used also for fecundity and age analysis. There was an attempt to remove gonads from 25 gravid females of five species (alewife, rainbow smelt, yellow perch, white perch, and smallmouth bass) during the spring spawning season (April through June) to estimate the fecundity of these fish. Gonads were analyzed using the same procedure described for fecundity analysis of lake fish (subsection A.6.b).

Scales for age analysis were removed from 25 individuals of the two most abundant species collected during each of three seasons sampled during 1977: spring (April-June), summer (July-September), and fall (October-December). Age data for the winter season was supplied by another consultant.

Scales were taken from the left side of the body above the lateral line and ventral to the origin of the dorsal fin of species having cycloid scales, and from the left side of the body below the lateral line at the distal tip of the depressed pectoral fin of species having ctenoid scales. When white perch were selected, scales were removed from the left side of the body and below the gap between the spinous and soft-rayed dorsal fins (Mansueti 1960).

Fish were aged using the same procedure described for Lake Ontario fish (subsection A.6.b).

c. Data Reduction and Analysis

Data were tabulated to present impingement rates (number and weight) for each species as well as all species combined. Two estimation techniques were used to calculate monthly impingement from the Monday, Wednesday, and Friday catches:

$$No._m = \frac{(x_n)\ (N)}{n} \tag{17}$$

where

$No._m$ = estimated impingement for month

x_n = total number (or weight) of species (or all species combined) collected during n sample days

N = number of days in sample month

n = number of days sampled during sample month

$$No._m = \frac{(x_n)\ (G)}{g} \tag{18}$$

where

x_n = total number (or weight) of species (or all species combined) collected during n sample days

G = total gallons of water taken into plant during sample month

g = total number of gallons taken into plant during days sampled

Annual impingement was estimated by summing the monthly impingement values calculated by Equation 17.

On a few occasions when high impingement rates inhibited the collection of all fish impinged during a 24-hour sampling period, the traveling screens were set to run continuously, then each 1-hour time block was subsampled by keeping the collection basket in sampling position for the first 1 to 15 minutes of the hour. The number and weight of fish captured in each subsample were then extrapolated proportionately on the basis of time to estimate the number and weight impinged for the hour. The 24 hourly estimates, in turn, were summed to estimate the total impingement for the 24-hour sampling period.

Age composition data were grouped by season of capture and by age class. Mean total lengths by age class and season were calculated using Equation 14 (subsection A.6.c).

Fecundity was calculated using the same equation (13, subsection A.6.c) that was used for Lake Ontario fish.

2. Entrainment/Viability

a. Nine Mile Point

Sampling within the Nine Mile Point plant documented entrainment of ichthyoplankton. Twice per month from April through October, two samples were collected during the day from the intake forebay at the Nine Mile Point (Unit 1) plant (Table III-4). Two 0.5-meter diameter, 571-micrometer mesh plankton nets were lowered simultaneously into the center forebay and set at depths of 2 and 8 feet. The stationary nets were set for 15 to 30 minutes, depending on how many pumps were running. The volume of water sampled was determined with a center-mounted digital flowmeter. The samples were preserved in 5 percent buffered formalin. Lab processing and data analysis techniques were the same as those used for Lake Ontario ichthyoplankton samples (subsection A.5).

b. James A. FitzPatrick

At the James A. FitzPatrick plant, entrainment and viability samples were collected twice monthly from January through December except during plant shutdown. Sampling involved all three major components of the planktonic biota in Lake Ontario: ichthyoplankton (fish eggs and larvae), zooplankton, and phytoplankton (Table III-4).

1) Ichthyoplankton

a) Field Sampling

To document entrainment rates for ichthyoplankton at the James A. FitzPatrick plant, day and night samples were collected from the intake forebay twice each month (Table III-4) by simultaneously lowering two 0.5-meter-diameter plankton nets (571-micrometer mesh) into the common forebay area. The metered nets were set for about 5 to 15 minutes approximately 14 and 20 feet below the water surface. Upon retrieval, the samples were processed first as viability samples (see below), then preserved with formalin and processed later for entrainment data. For entrainment, all ichthyoplankton were identified and enumerated by life stage using procedures described in subsection A.5.b.

To estimate mortality due to plant entrainment, the percentage of dead eggs and larvae in intake and discharge samples were compared. To ensure that the same water mass was sampled at both the intake and discharge, a calculated time lag (Table III-5) was used between discharge and intake sampling. Discharge samples (two from day and two from night) were taken by pumping water with a 750-gallon-per-minute centrifugal pump for about 5 minutes from a depth of 5 feet.

Table III-5

Time Required for Mass of Cooling Water To Flow from Intake Forebay to Discharge Aftbay and from Aftbay to Lake Ontario Discharge Structure

No. of Circulating Water Pumps Operating	Approximate Travel Time (minutes)	
	Intake Forebay to Discharge Aftbay	Discharge Aftbay to Lake Discharge Structure
1	9-12	18
2	5-6	9
3	3-4	6

After being filtered through the 571-micrometer mesh net, the pumped samples were held at the ambient discharge temperature for a period comparable to the travel time required for discharge water to flow from the point of collection to the discharge outlet in the lake (Table III-5). The samples then were diluted with filtered intake water to simulate the temperature change experienced by ichthyoplankton traveling from the discharge outlet to the 2°F isotherm in the plume (Figure III-2). The samples were processed to determine the percentage of live and dead eggs and larvae.

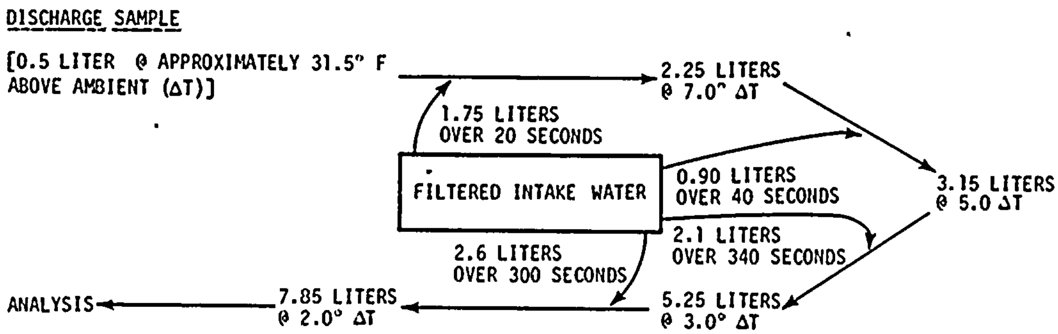


Figure III-2. Serial Dilution Sequence Used To Simulate Temperature Reduction in Thermal Plume from Discharge Outlet to 2°F Isotherm

To estimate mortality due to entrainment of Lake Ontario ichthyoplankton in the thermal plume, the percentage of dead eggs and larvae in simulated or actual plume samples was compared with mortality in the intake samples. Lake plume samples were collected from a depth of 5 feet by towing two 0.5-meter-diameter 571-micrometer mesh nets from the visible boil area above the discharge structure through the plume toward the 2°F isotherm. Sampling duration and tow velocity were similar to those during intake sampling. Two different plume simulation samples were obtained by collecting intake samples as previously described and simulating increasing and decreasing temperatures within the plume by adding filtered discharge water and then ambient filtered intake water (see Appendix II and Table II-7, LMS 1977).

b) Laboratory Processing

Viability samples were examined under a dissecting microscope soon after being collected. Dead eggs and larvae were removed, identified, enumerated, and preserved in 10 percent buffered formalin in a labeled vial. Live eggs and larvae were placed in a separate vial, preserved, and later identified and enumerated. Fish eggs were considered dead if they were opaque, had disrupted membrane structure or obvious surface abrasions, or were infected with fungus. The live/dead status of fish larvae was based primarily on movements, but larvae infected with fungus or exhibiting surface abrasions also were considered to be dead.

2) Zooplankton

a) Field Sampling

Zooplankton samples for documenting entrainment were collected from the intake forebay twice each month (Table III-4). Replicate zooplankton samples were pumped from approximately 5 feet below the surface of the forebay into a 76-micrometer mesh plankton net suspended in a barrel of ambient water. The pump was calibrated before each sampling period, and sufficient water was pumped to yield a concentration of approximately 200 zooplankton per counting chamber (Davies and Jensen 1974). The net contents were washed into an incubation container, were held in a water bath at ambient intake temperature for 8 to 10 hours, and then were used as a viability sample being analyzed for zooplankton densities. Densities were determined with lab analysis techniques that were identical to those used for lake zooplankton samples (subsection A.2.b).

The discharge aftbay samples were collected using the same procedures previously described for intake samples, and intake and discharge samples were compared to estimate mortality due to plant entrainment. To ensure that the intake and discharge samples came from the same mass of water, the replicate discharge samples were collected after the proper lag time (Table III-5). After being collected, the discharge samples were held at discharge water temperature to simulate travel time to the discharge structure in Lake Ontario, the temperature of the zooplankton samples was lowered to lake ambient by diluting the

samples with filtered intake water (Figure III-2). The samples were transferred to incubation chambers and held at ambient intake temperature for 8 to 10 hours before live /dead counts were made.

Procedures for measuring the effects of plume entrainment on zooplankton were similar to those used for ichthyoplankton (see Appendix II and Table II-5, LMS 1977).

b) Laboratory Processing

After the 8 to 10 hour incubation period, the viability sample was carefully washed into a 250-milliliter graduated beaker and uniformly mixed. A 1-milliliter aliquot was withdrawn using a wide bore pipette and placed in a clean Sedgwick-Rafter cell. All nonmotile organisms in the chamber were identified to major taxonomic groups and counted using a Whipple grid and 100X magnification. Mobility was defined as the ability of zooplankton to show any movement or activity whatsoever (e.g., appendicular and visceral movements). After the nonmotile organisms were counted, the Sedgwick-Rafter cell was placed on a hot plate for 5 minutes at 65°C to heat-kill all live organisms. Then, the entire chamber was examined again and all zooplankton identified to major taxonomic groups and counted. Live/dead counts from the two replicate samples at each location were used to calculate a mean percent mortality.

3) Phytoplankton

a) Field Sampling

The effect of entrainment on the phytoplankton community was determined by examining chlorophyll a concentrations and primary production rates (^{14}C method) at the intake forebay and the discharge aftbay and in the 3°F mixing zone in Lake Ontario near the diffuser discharge and ambient Lake Ontario waters near the 2°F isotherm (or 3° and 2°F simulation samples). Phytoplankton viability samples were collected twice per month both day and night (Table III-4).

At the intake forebay, two water samples were collected with a pump from a depth of about 5 feet. From each sample, four 2-liter aliquots were withdrawn for chlorophyll a determinations and four sets of BOD bottles (one light and one dark bottle per set) were filled for primary production measurements.

The four chlorophyll a samples were placed inside a black plastic bag and were held at ambient temperature for temporary storage, then transferred to the lab for further processing. Each BOD bottle for primary production measurements was allowed to overflow at least once its volume before being capped. These light and dark bottles were stored temporarily in a cool dark area, then transported to the lab for additional processing.

After the appropriate lag time (Table III-5), two discharge aftbay samples were pumped from approximately 5 feet below the water surface. The two discharge samples were held at the discharge water temperature for 6 to 18 minutes to simulate the travel time to the discharge structure. Then, both samples were placed in an ice bath until their temperatures approached to within 3°F of the intake (ambient) water temperature; at that time, four 2-liter aliquots were removed from each sample for chlorophyll a analysis and four sets of light/dark bottles were prepared using procedures identical to those used for the intake samples.

To determine the effect of plume entrainment, samples were collected from the 3°F and 2°F isotherms in the discharge area or were compared to plume thermal conditions. Lake samples were obtained by pumping the required water from 5 feet below the surface and were prepared in the same manner used for intake samples. For a simulation sample, approximately 30 liters of unfiltered intake water was mixed with 2.5 liters of discharge water (at prevailing discharge temperature) using a serial dilution scheme similar to that used for zooplankton simulation samples (LMS 1977).

b) Laboratory Processing

The light and dark bottles for primary production were brought into the laboratory within 2 hours of collection. These samples were injected immediately with 1 milliliter of $NaH^{14}CO_3$ (5 microcuries per liter) and placed in an incubator at ambient (intake) temperature under fluorescent lighting (about 200 foot-candles). Two sets (one light and one dark bottle per set) from each sampling location (intake, discharge, plume, simulation) were removed after 7-, 24-, 48-, and 72-hour incubation periods and processed according to methods described in subsection A.1.b. Primary production was reported as milligrams of carbon assimilated per cubic meter during the incubation period (Equation 8, subsection A.1.c).

The chlorophyll a samples were incubated with the productivity samples. Two 2-liter samples per location were removed after the 7-, 24-, 48-, and 72-hour incubation periods and filtered using the same techniques described for Lake Ontario samples (subsection A.1.b). Chlorophyll a and phaeophytin a concentrations were determined spectrophotometrically following laboratory and data reduction procedures described in subsection A.1.b and A.1.c.

SECTION IV

RESULTS AND DISCUSSION — LAKE ONTARIO STUDIES

The operation of two nuclear electric generating stations on the New York shoreline of Lake Ontario, located on the promontory called Nine Mile Point, has the potential to impact the lake ecosystem since both plants withdraw cooling water from the lake and discharge waste heat into the lake. This section of the report presents the results of ecological studies conducted in the vicinity of Nine Mile Point during 1977 to monitor the lake ecosystem as a means of detecting potential plant influences and assessing the importance of these influences, if any, with respect to the operation of two power stations. The 1977 study results represent the most recent ecological data available from a continuing program that has been administered by the utilities operating the stations; Niagara Mohawk Power Corporation and the Power Authority of the State of New York.

The Lake Ontario monitoring program was designed to describe the composition and relative abundance, both spatially and temporally, of the major components of the aquatic biota; including phytoplankton, zooplankton, periphyton, benthic invertebrates, and fish. The program also monitored water quality in the area. The study has two major objectives:

1) To monitor the aquatic ecosystem in the vicinity of the two plants following guidelines established in the Environmental Technical Specifications for the plants by the Nuclear Regulatory Commission

2) To assess the potential differences in abundance and distribution of the aquatic biota in the vicinity of Nine Mile Point; especially in the area immediately adjacent to the power stations (the experimental area) and in areas farther away from the stations (the control area) that usually are not influenced by plant operations.

A. PHYTOPLANKTON

Phytoplankton, which are minute aquatic plants, use the sun as an energy source for biochemically incorporating carbon needed for respiration and reproduction.

1. Phytoplankton Densities

In this study, cell density estimates for species composition and temporal and spatial distribution were used to describe the phytoplankton community. Chlorophyll a concentrations and rates of carbon assimilation (utilizing radioactive carbon^{-14} tracer methods) were used as an estimate of phytoplankton biomass and productivity.

a. Species Composition

Changes in species composition may be indicative of the physical and chemical factors that affect the composition of the phytoplankton community (Schelske et al 1971). In the vicinity of Nine Mile Point, 235 phytoplankton taxa were observed during the period from April through December 1977 (Appendix Table A-1). Of the 235 Taxa, only 59 comprised 2 percent or more of the total number of phytoplankton collected during any sampling month (Appendix Table A-2). All major phytoplankton divisions were observed but the majority of the taxa were green algae (Chlorophyta) and diatoms (Bacillariophyta-Centric and Pennate combined). These two divisions were represented by 120 and 48 taxa, respectively. Several taxa of nuisance algae were identified throughout the study, although none were encountered at levels high enough to create nuisance problems. Cladophora, a filamentous green alga capable of producing nuisance blooms, was observed during August, but it did not produce the large mats of growth along the shoreline during the present study as it has in previous years (Mantai, 1974).

b. Temporal Distribution

Total phytoplankton cell densitites fluctuated throughout the study year (Table IV-A 1). Lowest phytoplankton cell densities occurred during December, with the spring peak in May and a mid-summer peak during July. Monthly surveys revealed that cell densities were near 4900 cells/ml during the May peak and about 7000 cells/ml during the mid-summer peak when the highest mean cell densities were observed. Cell densities decreased in August and increased slightly during September followed by a gradual decrease through December. The three most abundant groups in the vicinity of the Nine Mile Point Nuclear Plant during 1977 were the diatoms, green algae and blue-green algae (Appendix Tables A-3 through A-6). Diatoms

Table IV-A 1

Mean Density (No./mℓ) and Relative Abundance* (R.A.) of Major Phytoplankton Groups Collected in Surface Samples, and Associated Chlorophyll a Concentrations and Primary Production Rates, Nine Mile Point Vicinity, April through December 1977

Division	Apr No./mℓ	Apr R.A.	May No./mℓ	May R.A.	Jun No./mℓ	Jun R.A.	Jul No./mℓ	Jul R.A.	Aug No./mℓ	Aug R.A.	Sep No./mℓ	Sep R.A.	Oct No./mℓ	Oct R.A.	Nov No./mℓ	Nov R.A.	Dec No./mℓ	Dec R.A.	Annual Mean No./mℓ	Annual Mean R.A.
Cyanophyta	32.5	4.1	237.7	4.9	693.2	43.7	779.2	11.2	788.7	16.2	2265.7	46.2	1304.0	42.0	115.4	13.7	37.8	14.0	694.9	22.1
Chlorophyta	153.0	19.4	1332.5	27.2	545.6	34.4	3964.5	56.9	3307.5	67.8	1967.0	40.1	822.4	26.5	216.7	25.7	43.7	16.2	1372.5	43.7
Euglenophyta	1.2	0.2	2.9	<0.1	0.7	<0.1	14.6	0.2	2.1	<0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.1
Chrysophyta	7.0	0.9	76.4	1.6	113.2	7.1	104.5	1.5	7.2	0.1	218.8	4.5	28.9	0.9	51.5	6.1	31.7	11.8	71.0	2.3
Xanthophyta	0.0	0.0	0.0	0.0	0.0	0.0	20.6	0.3	43.5	0.9	9.0	0.2	9.6	0.3	32.9	3.9	0.2	<0.1	12.9	0.4
Bacillariophyta	398.4	50.4	2914.3	59.5	167.0	10.5	938.9	13.5	171.7	3.5	215.4	4.4	562.0	18.1	293.5	34.9	95.3	35.4	639.6	20.4
Pyrrhophyta	14.0	1.8	64.4	1.3	5.6	0.4	18.5	0.3	15.8	0.3	7.8	0.2	3.8	0.1	1.3	0.2	2.4	0.8	14.8	0.5
Cryptophyta	184.6	23.3	210.6	4.3	59.1	3.7	1131.0	16.2	530.4	10.9	217.0	4.4	371.8	12.0	125.5	14.9	51.9	19.3	320.2	10.2
Unidentified algae	0.0	0.0	61.2	1.3	0.8	<0.1	0.0	0.0	12.1	0.3	2.6	<0.1	3.3	0.1	5.4	0.6	6.4	2.4	10.2	0.3
Total Density	790.7		4900.0		1585.2		6971.8		4879.1		4903.2		3105.7		842.3		269.4		3138.6	
Chlorophyll a (mg/ℓ)	4.70		11.30		7.54		8.49		5.55		5.59		4.14		2.04		1.58		5.66	
Primary Production (mgC/m³/4-hr)	18.85		33.71		17.30		3.58		5.77		14.22		10.79		4.66		6.09		12.77	

*Mean density based on 32 surface samples per sampling date and relative abundance equals major group density divided by total density times 100.

were dominant during April, May, November, and December when water temperatures were low (Table IV-A 1). Blue-green algae dominated the community in June, September, and October while during July and August the greens were dominant; these two groups typically reach their peak abundances during warmer water periods. During June and September, the green algae were second in abundance in the phytoplankton community.

Phytoflagellates (Cryptophyta) were second in abundance during April, July and December. Other phytoplankton divisions collected included the Euglenophyta, Chrysophyta, Xanthophyta, and Pyrrhophyta (dinoflagellates). Densities of these groups were low throughout the study period (Table IV-A 1).

c. Spatial Distribution

There were no apparent spatial trends among sampling stations within each sampling month for either individual divisions or total phytoplankton densities, nor were there specific trends established among depth contours. In addition, there were no apparent differences of total phytoplankton among the control (transects NMPW and NMPE) and experimental areas (transects NMPP and FITZ) and there were no trends established for a total density gradient from onshore to offshore (Appendix Table A-7). Monthly densities of the phytoplankton divisions and total phytoplankton by sampling location are presented in Appendix I-A, pages I-A 1 through I-A 22 of the 1977 Data Report for Nine Mile Point (Texas Instruments Incorporated 1978).

Short-term variations in distribution in natural waters are relatively common and occur as a result of turbulence, surface winds, and other temporary conditions. Turbulence is probably the most important condition influencing short-term variations, and it tends to negate physical and chemical factors that are necessary for long-term spatial differences to develop.

Spatial distribution data for the total phytoplankton community at depths equivalent to the 50 percent, 25 percent, and 1 percent light penetration levels indicated a general trend for higher densities at the 1 percent

than either the 25 or 50 percent light penetration levels (Appendix Table A-7). However, August sampling indicated total densities at the 50 percent level were much higher than the other levels when nearly 74 percent of the sample consisted of Microcystis spp., a blue-green alga.

2. Chlorophyll a and Phaeophytin a

a. Temporal Distribution

The chlorophyll a and phaeophytin a concentrations are presented in Appendix Tables A-8 and A-9. The highest monthly average for chlorophyll a concentration was observed during May when a spring cell density peak was observed (Table IV-A 1). A second smaller peak in chlorophyll a occurred during July when total phytoplankton densities were highest. The lowest chlorophyll a concentration occurred during December when densities were lowest. Generally, phytoplankton cell densities can be directly correlated to chlorophyll a concentrations. However, during certain periods when the chlorophyll a degradation product (phaeophytin a) is present, it may affect the determination of the chlorophyll a concentrations since phaeophytin a is spectrophotometrically inactive. The monthly mean phaeophytin a concentrations were low throughout the study, although the relatively high concentration of phaeophytin that occurred during July sampling may be partially responsible for the lower chlorophyll a result in relation to cell density.

Surveys of chlorophyll a/phaeophytin a concentrations were conducted with water quality collections semimonthly at the 20- and 60-foot depth contours. Results revealed that throughout the study, trends in chloropyll a concentrations at the 20- and 60-foot contours were similar to trends observed in concurrent lake phytoplankton samples (Appendix Table G-3). Peaks of chlorophyll a concentrations were observed from the water quality samples during May and September. Phaeophytin a concentrations were small throughout the study and in many cases were less than detection limits.

b. Spatial Distribution

There were no distinct spatial distribution differences for chlorophyll a or phaeophytin a concentrations among sampling stations within a monthly sampling period (Appendix Tables A-8 and A-9). A slight decrease in chlorophyll a

concentration was observed from the 10-foot out to the 60-foot depth contour (based on a yearly mean).

The distribution at the 50 percent, 25 percent, and 1 percent light transmittance levels showed the chlorophyll a concentrations were slightly higher at the 1 percent level, and lowest at the 25 percent level. Phaeophytin a values showed a distinct vertical distribution, with the lowest values at the 50 percent light transmittance level and the highest values at the 1 percent level.

Chlorophyll a concentrations were slightly higher at the experimental transects than the control transects (Appendix Table A-8), but there were no overall differences among the control and experimental transects for the phaeophytin a values (Appendix Table A-9).

3. Primary Productivity

a. Temporal Distribution

Primary productivity is a measure of carbon assimilated by phytoplankton. The highest rates of productivity for the lake samples were observed during May and low rates were observed during late summer (July and August) and late fall (November and December) (Appendix Table A-10). The monthly rates did not appear to show consistent trends with total phytoplankton cell densities and chlorophyll a (Table IV-A 1). This phenomenon is not unusual for waters with generally low phytoplankton densities as were found in the Nine Mile Point area during 1977. Results of primary productivity studies conducted by Vollenweider et al (1974) on Lake Ontario support this year's results.

b. Spatial Distribution

Primary productivity values along the depth contours indicated a decreasing productivity from inshore out to the 60-foot depth contour (Appendix Table A-10). A similar trend was exhibited in the chlorophyll a results (Appendix Table A-8). Within each monthly sampling period, no consistent trends in productivity appeared among stations. Likewise, based on annual means, no trends were observed among stations.

There was no consistent productivity trends among either the light transmittance levels or among the experimental and control transects. These results indicate that rates of carbon assimilation were quite variable for the 1977 study in the Nine Mile Point vicinity.

B. ZOOPLANKTON

The zooplankton community in the vicinity of Nine Mile Point was sampled using nets of two different sizes. A 12-centimeter diameter Wisconsin net with 76-micron mesh was used to sample microzooplankton (smaller zooplankton) while a 1-meter diameter Hensen net with 571-micron mesh was used to monitor macrozooplankton (larger zooplankton). The following discussion presents data on microzooplankton and macrozooplankton separately.

1. Microzooplankton

The microzooplankton community is composed of protozoans, rotifers, small microcrustaceans, and early life stages of larger macrozooplankters. For this study the microzooplankton were defined as those invertebrates larger than 76 microns but less than 571 microns.

a. Species Composition

Forty-seven microzooplankton taxa were collected during 1977, of which Rotifera was the dominant group (Appendix Table B-1). All other taxa combined, including Protozoa, Calanoida, Cyclopoida, Cladocera, and Copepoda nauplii, accounted for only 26 percent of the microzooplankton community sampled during 1977. Numbers of microzooplankton taxa decreased from April to May and subsequently increased steadily, reaching a peak in September and October. Numbers of taxa decreased from October to November and increased again in December. Microzooplankton taxa numbers ranged from a low of 20 in May to a high of 30 in September and October.

b. Temporal Distribution

The seasonal distribution pattern of total microzooplankton abundance was essentially unimodal (Table IV-B 1); density increased sharply beginning in April, reached an annual peak of 228,000 organisms per cubic meter in June, and subsequently declined steadily through November. Density increased slightly again in December.

Rotifers totally dominated the microzooplankton community throughout the duration of this study except during August, when cyclopoid copepods prevailed. Rotifers ranged in percent composition from 91 percent in May to 27

Table IV-B 1

Percent Relative Abundance of Major Microzooplankton Groups and Total Density of Microzooplankton from Wisconsin Net (76-Micron) Oblique Tows, Nine Mile Point Vicinity, 1977

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
Protozoa	1	1	T	T	T	T	1	1	1	1
Rotifera	50	91	85	70	27	68	46	55	45	74
Cladocera	1	T	5	13	9	10	8	9	9	7
Calanoida copepoda	7	T	T	T	1	3	13	11	3	1
Cyclopoida copepoda	26	1	2	8	47	10	19	16	21	8
Copepoda nauplii	15	7	8	9	16	9	13	8	21	9
Others	0	0	0	T	0	0	T	0	0	T
Total Density (No./m^3)	6,638	61,064	228,047	137,788	39,260	27,980	12,916	9,938	15,013	59,899

T = <0.5%

percent in August (Table IV-B 1). Highest Rotifera density occurred in June, accounting for the major portion of the peak in total density observed for that period (Appendix Table B-2). The most abundant organism throughout this survey was the Rotifer, Keratella sp., which ranged in percent composition from 7 percent in April to 66 percent in June and had an annual mean of 38 percent (Appendix Table B-1). Copepoda nauplii and Cyclopoida, which were the second and third most abundant groups throughout the survey, accounted for only 9 percent and 8 percent of the microzooplankton community during 1977 respectively (Table IV-B 1). These latter two groups displayed highest percent composition during April, August, and December. The Cladocera group reflected an annual mean of 7 percent with peak relative abundance during July. Calanoida and Protozoa each accounted for only 1 percent of the microzooplankton collected during the 1977 study. the 1977 study.

c. Spatial Distribution

No salient differences were observed in total microzooplankton density between individual transects or between experimental and control transects (Table IV-B 2), although slightly higher densities were observed at control transects in all months except May, June, and December. The distribution of microzooplankton in the study area with respect to depth contours was also characterized by an overall lack of consistent differences. The only sustained depth-related distribution pattern occurred during May, June, and July, when total density decreased as depth increased (Table IV-B 2).

Table IV-B 2

Abundance (No./Cubic Meter) of Microzooplankton from Wisconsin Net (76 Micron) Oblique Tows, Nine Mile Point Vicinity, 1977

TOTAL MICROZOOPLANKTON

DEPTH CONTOUR (FT)	TRANSECT	20 APR		18 MAY		16 JUN		12 JUL		10 AUG		15 SEP		13 OCT		8 NOV		14 DEC		ANNUAL	
		MEAN	S.E.*	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
10	NMPW	4899	624	61506	190	517342	4703	121024	1650	37451	276	17757	1469	15549	622	9933	1235	7850	53	88146	55062
	NMPP	3689	62	95664	2284	312557	12502	155049	9783	32459	392	8567	96	6052	0	1809	93	9124	692	69441	35109
	FITZ	5922	855	76509	635	284418	20084	250350	350	26374	1236	26361	1631	10376	351	10913	198	17341	2482	78729	36437
	NMPE	10642	407	94778	2393	297581	18865	208217	2200	33530	0	20871	2533	14148	644	18767	747	15660	1581	79355	34699
	CONTOUR MEAN	6288	1521	82113	8165	352974	55090	183660	28566	32384	2243	18383	3726	11531	2128	10355	3468	12494	2353	78918	3821
20	NMPW	4177	72	83028	1535	234485	4378	118545	1726	37298	1506	30357	1190	19673	1162	5573	563	6804	64	59993	25367
	NMPP	3910	515	80565	729	330342	920	146814	1637	20946	0	29838	1126	6062	240	11925	666	15619	730	71780	35856
	FITZ	4724	126	57296	5431	315606	18074	124894	3134	24559	243	27454	243	8052	700	10777	1007	10725	573	64899	33800
	NMPE	10114	674	76842	3907	110890	5511	184351	4132	37589	446	34921	828	9594	352	21265	7503	15406	440	55608	19636
	CONTOUR MEAN	5731	1471	74433	5852	247831	50276	143651	14857	30098	4305	30642	1560	10846	3030	12385	3267	12138	2106	63070	3468
40	NMPW	3985	476	58344	3605	201018	14177	160907	13613	43680	613	39779	1105	15369	722	3259	173	16094	208	60270	23870
	NMPP	3384	435	52061	1016	211648	17883	139361	3192	31009	406	22213	1650	23214	476	10042	170	16296	790	56581	23722
	FITZ	4346	182	43483	2504	156559	6783	104622	756	31288	6989	45863	958	11877	616	9648	224	16425	451	47123	17065
	NMPE	12519	77	33171	518	149576	7596	167426	2315	87140	11986	37435	3489	15538	1809	7637	92	16347	601	58532	20544
	CONTOUR MEAN	6058	2163	46765	5460	179700	15594	143079	14152	48279	13286	36323	5027	16499	2392	7647	1555	16290	71	55626	2933
60	NMPW	4889	43	45936	4547	159551	3010	92773	448	35426	1515	41246	3006	11336	166	8090	731	19759	1186	46556	16762
	NMPP	4620	142	52080	2411	186978	4574	70605	999	34756	0	26175	1857	13577	997	10253	632	16611	664	46184	18981
	FITZ	9903	1403	32664	1300	132769	4773	89558	1325	27481	172	19280	790	11766	707	8356	404	20178	269	39106	14333
	NMPE	14485	0	33094	343	47427	895	70112	2004	87442	3050	19554	1013	14479	778	10763	665	19964	1528	35285	9155
	CONTOUR MEAN	8475	2344	40943	4823	131681	30186	80762	6043	46276	13839	26564	5147	12789	743	9365	670	19128	843	41783	2762
CONTROL MEAN**		8214	1486	60837	8089	214734	50899	140419	16767	49945	8213	30240	3390	14461	1068	10661	2216	14736	1735	60468	5943
EXP. MEAN**		5062	744	61290	7449	241360	27767	135157	19412	28609	1620	25719	3718	11372	1955	9215	1120	15277	1273	59230	5005
MONTHLY MEAN		6638	623	61064	10129	228047	47977	137788	21250	39278	4893	27979	3771	12916	1148	9938	1214	15006	1042	59849	3757
MONTHLY RANGE		3384– 14489		32664– 94778		47427– 517342		70112– 250350		20946– 87442		8567– 45863		6052- 23214		1809- 21265		6804- 20179		35285- 88146	

*STANDARD ERROR.
**CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ.

Depth related differences in total microzooplankton density were primarily a function of rotifers (Appendix Table B-2). During May, June, and July, rotifers comprised a higher percentage of the total microzooplankton community (from 70 to 91 percent) than in any other month and also displayed a decrease in density as water depth increased. While no major density differences between control and experimental transects were observed for the major microzooplankton groups (Appendix Tables B-3, B-4, and B-5), several taxa such as calanoid copepods, copepod nauplii, and total Copepoda displayed slightly higher density at control transects during most of the study period [see 1977 Data Report for distribution data of total copepods and other microzooplankton (TI 1978)].

2. Macrozooplankton

a. Species Composition

Thirty-five (35) taxa of macrozooplankton were collected during the study (Appendix Table B-6). During 1977, cladocerans completely dominated the macrozooplankton collections (Table IV-B 3). All other groups combined accounted for only one percent of the total macrozooplankton population. Two scuds (Amphipoda), Gammarus fasciatus and Pontoporeia affinis, and a Mysid shrimp, Mysis oculata relicta (Mysidacea) were designated as selected species for this study but were rare or absent in macrozooplankton collections (Appendix Table B-6). All three species are epibenthic during the day and migrate up into the water column only during evening hours. G. faciatus and P. affinis were the dominant taxa in 1977 benthic collections (Appendix Tables D-1 through D-5) and their temporal and spatial distribution is discussed in that section (subsection IV-D).

b. Temporal Distribution

The seasonal distribution pattern of total macrozooplankton abundance was essentially trimodal (Table IV-B 3). Density increased from April to May when an initial peak occurred, declined in June, and then steadily increased until the major annual peak was reached in August. Densities subsequently declined but another minor peak in densities was observed in November. Cladocera accounted for almost all of the macrozooplankton during the major density

Table IV-B 3

Percent Relative Abundance of Major Macrozooplankton Groups and Total Density of Macrozooplankton Collected from Composited* Hensen Net (571 Micron) Tows in the Vicinity of Nine Mile Point, 1977

Taxa	Collection Dates									Annual Mean
	15 Apr	11 May	14 Jun	13 Jul	9 Aug	12 Sep	11 Oct	7 Nov	16 Dec	
Cladocera	32	11	90	86	100	98	99	80	91	99
Copepoda-Calanoida	68	88	2	13	T	T	1	20	9	1
Copepoda-Cyclopoida	T**	1	7	T	T	0	0	0	T	T
Amphipoda	0	0	T	T	0	0	0	0	0	T
Diptera	0	1	T	T	0	0	0	0	0	T
Other	0	0	T	T	0	3	0	T	0	T
Total Mean Density (No./1000 m^3)	15,196	41,218	10,692	45,532	32,689,720	75,258	131,420	179,296	91,932	33,290,263

*Composite of surface, mid-depth, and bottom horizontal tows.

**T = <0.5%.

Table IV-B 4

Abundance (No./1000 Cubic Meters) of Macrozooplankton from Composited* Hensen Net (571 Micron) Tows, Nine Mile Point Vicinity, 1977

TOTAL MACROZOOPLANKTON

Date	20-Ft Contour**							40-Ft Contour**							60-Ft NMPP	80-Ft NMPP	100-Ft NMPP	Grand Mean
	3-West	1-West	1/2-West	1/2-East	1-East	3-East	Mean	3-West	1-West	1/2-West	1/2-East	1-East	3-East	Mean				
Apr	15934	12055	35631	14119	21445	9624	18148	3863	9091	8758	12221	33367	6660	12321	24209	9990	10922	15196
May	6960	15518	15052	20146	64136	31968	25630	15594	34965	26407	22544	34132	11722	24226	177169	148152	143789	51218
Jun	11022	9357	5661	5861	9690	10256	8641	10756	10856	9923	14752	15251	8025	11594	11488	13486	13986	10692
Jul	43889	105161	86713	5395	7393	4895	42241	102198	97469	46753	8558	4129	5461	44095	2531	105628	56010	45532
Aug	3.4×10^{6}	3.0×10^{6}	1.2×10^{7}	1.4×10^{7}	4.5×10^{7}	2.3×10^{7}	1.7×10^{7}	5.5×10^{6}	6.4×10^{6}	6.1×10^{6}	6.0×10^{7}	5.4×10^{7}	1.0×10^{8}	3.9×10^{7}	1.0×10^{8}	4.7×10^{7}	7.6×10^{6}	3.2×10^{7}
Sep	172627	102031	51948	53280	33367	16850	71684	223110	86180	47719	57343	46220	26640	81202	53114	68365	90076	75258
Oct	225175	226906	140659	75991	70729	180386	153308	183849	167233	94039	107959	83583	192274	138156	57542	42557	122411	131420
Nov	41392	62671	58308	52248	99400	51249	60878	53446	124009	93107	420446	414518	964868	345066	86180	69997	97602	179296
Dec	35498	46254	58575	16583	293506	292441	123809	37396	35331	45255	55345	188878	167566	71628	29504	64269	112587	91932
Annual Mean	4.4×10^{5}	4.0×10^{5}	1.4×10^{6}	1.5×10^{6}	5.1×10^{6}	2.6×10^{6}	1.9×10^{6}	6.8×10^{5}	7.8×10^{5}	7.2×10^{5}	6.7×10^{6}	6.1×10^{6}	1.1×10^{7}	4.4×10^{6}	1.1×10^{7}	5.3×10^{6}	9.2×10^{5}	3.3×10^{7}

*Composite of surface, mid-depth, and bottom horizontal tows.

**Stations along contours are established within 3, 1, and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1.

peak in August, while calanoid copepods were relatively abundant, along with cladocerans, during the minor peaks in May and November.

Cladocerans totally dominated the macrozooplankton community during most of the sampling season. The temporal distribution pattern for cladocerans generally followed total density distribution through the year, with greatest density occurring in August when values three orders of magnitude higher than any other month were recorded. This "bloom" of cladocerans was composed primarily of <u>Daphnia retrocurva</u> and <u>Daphnia galeata mendotae</u> (Appendix Table B-6). Calanoid copepods dominated the macrozooplankton during April and May (~~82~~ 68 percent and ~~92~~ 88 percent respectively) and were also abundant in July and November (~~33~~ 13 percent and ~~31~~ 20 percent respectively). All other taxa combined; including cyclopoid copepods, scuds (amphipods) and dipterans, comprised less than 1 percent of the total macrozooplankton community during 1977.

c. Spatial Distribution

The distribution of total macrozooplankton (Table IV-B 4) was a reflection of the concentrations of cladocerans, which were widely distributed over the study area during 1977 (Appendix Table B-7). Cladoceran concentrations in 40 feet of water were more than two times greater than in 20 feet on an annual basis, but no consistent depth-related distribution pattern was evident throughout the year because most of the annual difference was due to high August densities. There were no apparent cladoceran concentration differences between stations near the thermal discharges [stations on the 20- and 40-foot depth contours within the one-half-mile radius and within the one-mile radius east zone (Figure III-1 in Section III, Methods and Materials)] and other stations. Greatest density of total macrozooplankters was generally confined to stations 60 feet deep or deeper during all seasons except fall (Table IV-B 4).

C. PERIPHYTON

1. Bottom Periphyton

a. Species Composition

Eight algal divisions were represented in periphyton collected from artificial substrates placed on the lake bottom from early May through mid-December 1977 (Table IV-C 1). Green algae (Chlorophyta) were most numerous with blue-green algae (Cyanophyta) and diatoms (Bacillariophyta-Centric and Pennate combined) following in order of abundance. All other algal divisions combined represented less than 2 percent of the total number of periphyton present.

Of the 230 taxa collected during the study, only 12 accounted for more than 2 percent of the total annual abundance (Appendix Tables C-1 and C-2). These 12 taxa comprised 85 percent of the total bottom periphyton with the most abundant alga, Lyngbya spp., a filamentous blue-green, making up 32 percent of the bottom periphyton community. Only 47 taxa represented 2 percent or more of the relative abundance (by number) during any one sampling period.

b. Temporal Distribution

Bottom periphyton were most abundant during spring (May) and mid-summer (August) (Table IV-C 2). Periphyton biomass data also exhibited correspondingly high values during these two sampling periods (Table IV-C 3). Maximum extent of the bottom periphyton community was present during the spring temperature transition period and again in mid-summer, producing a bimodal growth cycle.

Green algae had the highest relative abundance in spring and early summer and comprised at least 14 percent of the bottom periphyton community during the fall period (Table IV-C 1 and Appendix Table C-4). Blue-green algae predominated in mid-summer and diatoms comprised the highest numerical percent composition in the fall (Appendix Tables C-3 through C-6). Other algal divisions were of minor importance during the year except in the late summer and fall when cryptophytes accounted for 9 to 14 percent of the bottom periphyton.

Table IV-C 1

Percent Relative Abundance (by Number) of Bottom Periphyton Collected on Artificial Substrates, Nine Mile Point Vicinity, 1977

DIVISION	SPRING 2-25 May	LATE SPRING 25 May-30 Jun	EARLY SUMMER 30 Jun-27Jul	MID-SUMMER 27 Jul-6 Sep	LATE SUMMER 2-30 Sep	EARLY FALL 30 Sep-25 Oct	MID-FALL 25 Oct-30 Nov	LATE FALL** 30 Nov-16 Dec	ANNUAL MEAN
Cyanophyta	3	2	36	61	32	22	28	25	34
Chlorophyta	63	54	52	39	34	39	15	14	49
Euglenophyta	0	T*	0	0	0	0	0	0	T
Xanthophyta	0	1	0	0	T	T	1	0	T
Chrysophyta	T	1	3	0	0	2	1	T	T
Bacillariophyta	32	33	7	1	20	26	47	56	16
Pyrrhophyta-Dinophyceae	2	1	T	0	T	T	T	0	T
Cryptophyta	0	8	2	0	14	10	9	2	1
Number of Taxa	109	125	104	104	112	97	72	85	228

*T = < 0.5%

**Unidentified algae accounted for 2% of the periphyton.

Table IV-C 2

Abundance (No./Square Millimeter) of Bottom Periphyton Collected on Aritifical Substrates, Nine Mile Point Vicinity, 1977

DEPTH CONTOUR	TRAN-SECT	SPRING 2-25 MAY MEAN	S.E.*	LATE SPRING 25 MAY - 30 JUN MEAN	S.E.	EARLY SUMMER 30 JUN - 27 JUL MEAN	S.E.	MID-SUMMER 27 JUL - 6 SEP MEAN	S.E.	LATE SUMMER 2 - 30 SEP MEAN	S.E.	EARLY FALL 30 SEP - 25 OCT MEAN	S.E.*	MID-FALL 25 OCT - 30 NOV MEAN	S.E.	LATE FALL 30 NOV - 16 DEC MEAN	S.E.
5	NMPW	164731	32738	2544	984	NS		365821	113626	NS		2688	559	NS		NS	
	NMPP	229161	30904	NS**		689	80	NS		NS		2175	520	NS		NS	
	FITZ	130884	40729	3014	534	NS		NS		NS		NS		NS		NS	
	NMPE	105636	19815	NS		NS		NS		NS		NS		NS		NS	
	CONTOUR MEAN	157603	26749	2779	235	344	344	365821	113626			2432	256				
10	NMPW	90426	26786	1385	256	NS		10654	4093	2809	254	NS		76	32	NS	
	NMPP	137401	25554	NS		2061	967	NS		7824	2120	NS		NS		NS	
	FITZ	180351	52850	1833	324	NS		20370	6484	2806	301	377	66	1208	427	NS	
	NMPE	92302	5484	NS		NS		NS		NS		248	47	3653	546	NS	
	CONTOUR MEAN	125120	21374	1609	224	2061	967	15512	4858	4479	1672	312	65	1646	1055		
20	NMPW	17202	753	3017	1033	NS		5221	716	NS		1443	287	NS		NS	
	NMPP	39095	2856	4039	756	NS		2835	1070	6177	2165	1490	212	NS		51	26
	FITZ	23506	1590	3571	1392	10232	3173	NS		1791	367	1293	109	1017	89	9423†	7957
	NMPE	10503	1168	7967	2998	NS		3589	1878	2446	339	NS		NS		NS	
	CONTOUR MEAN	22576	6113	4649	1126	10232	3173	3882	704	3471	1366	1409	59	1017	89	3158	3132
30	NMPW	2859	969	3099	1059	599	64	2000	689	4772	287	NS		1002	228	NS	
	NMPP	2572	437	10523	4257	NS		NS		2466	329	1044	227	830	96	NS	
	FITZ	2706	603	4052	460	2083	529	NS		NS		1260	235	1154	252	2811	1981
	NMPE	837	53	1672	392	NS		1790	607	4669	787	789	339	NS		142	49
	CONTOUR MEAN	2243	473	4837	1957	1341	742	1895	105	3478	1363	1031	136	995	94	1476	1335
40	NMPW	1482	307	1490	437	1558	137	858	351	NS		2413	479	1830	604	127	37
	NMPP	1855	47	6204	2189	2231	919	1587	1232	3798	380	1599	433	NS		73	20
	FITZ	1471	351	1648	289	580	183	NS		1745	156	1021	180	NS		NS	
	NMPE	938	223	957	146	NS		2458	656	NS		147	9	NS		NS	
	CONTOUR MEAN	1436	189	2574	1219	1457	479	1634	463	2771	1027	1295	477	1830	604	100	27
CONTROL MEAN***		48691	18768	2766	794	1079	480	49049	45266	3674	609	1288	443	1640	761	135	8
EXP. MEAN***		74900	27295	4361	1016	2979	1481	8264	6064	3801	885	1282	183	1052	84	3090	2208
MONTHLY MEAN		61796	16398	3563	656	2504	1131	37926	32835	3755	583	1285	207	1346	371	2105	1529
MONTHLY RANGE		837–23506		957–10523		580–10232		858–365821		1745–7824		149-2688		76-3653		51-9423	

*STANDARD ERROR
**NO SAMPLE, SUBSTRATES LOST DUE TO SEVERE WEATHER
***CONTROL REPRESENTS NMPW & NMPE. EXPERIMENTAL REPRESENTS NMPP AND FITZ
†MEAN OF 3 REPLICATES

Table IV-C 3

Ash-Free Dry Weight (Milligrams/Square ~~Millimeter)~~ Decimeter of Bottom Periphyton Collected on Artificial Substrates, Nine Mile Point Vicinity, 1977

DEPTH CONTOUR	TRANSECT	SPRING 2-25 MAY		LATE SPRING 25 MAY - 30 JUN		EARLY SUMMER 30 JUN - 27 JUL		MID-SUMMER 27 JUL-6 SEP		LATE SUMMER 2 SEP - 30 SEP		EARLY FALL 30 SEP 25 OCT		MID-FALL 25 OCT-30 NOV		LATE FALL 30 NOV-16 DEC	
		MEAN	S.E.*	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.*	MEAN	S.E.*	MEAN	S.E.*
5	NMPW	24.99	2.77	7.77	1.49	NS		41.67#	5.82	NS		9.83	0.96	NS		NS	
	NMPP	39.48	2.91	NS**		8.07	1.81	NS		NS		7.39	0.82	NS		NS	
	FITZ	27.29#	4.89	5.65	1.11	NS		NS		NS		NS		NS		NS	
	NMPE	24.48	1.73	NS		NS		NS		NS		NS		NS		NS	
	CONTOUR MEAN	29.06	3.53	6.71	1.06	8.07	1.81	41.67	5.82			8.61	1.22				
10	NMPW	22.73	4.97	4.83	1.13	NS		6.70	1.18	47.15	28.42	NS		2.83	1.08	NS	
	NMPP	35.65	3.20	NS		13.21	3.24	NS		5.21	0.71	NS		NS		NS	
	FITZ	31.90#	5.47	8.89	3.44	NS		12.87	2.83	4.76	0.49	6.36	1.21	7.00	0.90	NS	
	NMPE	21.47	2.54	NS		NS		NS		NS		6.78	1.82	8.40	1.10	NS	
	CONTOUR MEAN	27.94	3.47	6.86	2.03	13.21	3.24	9.78	3.08	19.04	14.06	5.57	0.21	6.07	1.67		
20	NMPW	7.45	1.46	6.99	3.08	NS		13.14##	2.62	NS		6.36	0.90	NS		NS	
	NMPP	9.27	1.72	5.22	0.59	NS		8.63	1.37	17.47	2.71	6.99	0.87	NS		7.74	3.96
	FITZ	8.42	0.76	7.13	1.26	14.92	3.90	NS		16.45	1.15	7.51	0.91	7.23	0.77	4.48	0.75
	NMPE	4.15	0.93	14.83	3.02	NS		13.13##	6.70	18.90	4.50	NS		NS		NS	
	CONTOUR MEAN	7.32	1.12	8.54	2.14	14.92	3.90	11.63	1.50	17.61	0.71	6.95	0.33	7.23	0.77	6.11	1.63
30	NMPW	3.03	1.35	7.44	1.71	8.94	1.05	10.77###		4.49	0.30	NS		5.28	0.43	NS	
	NMPP	3.76	2.01	16.83#	2.34	NS		NS		10.65	0.83	9.93	0.79	6.50	0.48	NS	
	FITZ	5.84	1.64	11.00	2.07	13.05	3.22	NS		NS		7.37	0.40	10.34	1.95	4.52	0.53
	NMPE	4.50	1.76	10.01	2.21	NS		12.26	2.46	6.35	0.83	8.68	2.55	NS		3.38	0.93
	CONTOUR MEAN	4.28	0.60	11.32	1.98	10.99	2.05	11.51	0.74	7.16	1.82	3.66	0.74	7.37	1.53	3.95	0.57
40	NMPW	1.82	0.71	8.56	1.46	10.37	0.71	9.66	0.80	NS		8.18	1.36	6.47	1.86	3.83	0.98
	NMPP	5.34	1.36	28.17	4.95	15.34	2.85	6.39	0.74	3.66	0.12	5.19	1.76	NS		3.12	0.44
	FITZ	2.78	0.70	8.17	1.35	8.67	2.36	NS		6.54	0.64	7.84	1.24	NS		NS	
	NMPE	2.82	1.05	7.39	0.91	NS		10.52	2.11	NS		3.91	1.22	NS		NS	
	CONTOUR MEAN	3.19	0.75	13.07	5.04	11.46	2.00	8.86	1.26	5.10	1.44	6.28	1.03	6.47	1.86	3.48	0.36
	CONTROL MEAN	11.74	3.22	8.48	1.04	9.66	0.72	14.73	3.92	19.22	9.84	7.29	0.85	5.75	1.17	3.61	0.23
	EXP MEAN	16.97	4.66	11.38	2.73	12.21	1.27	9.30	1.90	9.25	2.16	7.32	0.48	7.77	0.87	4.97	0.98
	MONTHLY MEAN	14.36	2.82	9.93	1.46	11.57	1.03	13.25	2.93	12.88	3.83	7.31	0.43	6.76	0.77	4.51	0.69
	MONTHLY RANGE	1.82-39.48		4.83-28.17		8.07-15.34		6.39-41.67		3.66-47.15		3.91-9.93		2.83-10.34		3.12-7.74	

*STANDARD ERROR
**NO SAMPLE, SUBSTRATES LOST DUE TO SEVERE WEATHER
***CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP AND FITZ

#NUMBER REPRESENTS MEAN OF 3 REPLICATES
##NUMBER REPRESENTS MEAN OF 2 REPLICATES
###NUMBER REPRESENTS MEAN OF 1 REPLICATE

Lyngbya was dominant during mid-summer (Appendix Table C-2). Extensive growths of Lyngbya can interfere with passage of cooling waters through power plants (Round 1965); however, Lyngbya produced no problems at either the Nine Mile Point or James A. FitzPatrick power plants during 1977.

Green algae consistently accounted for higher numbers of taxa in the bottom periphyton community than any of the other divisions. The number of diatom and blue-green taxa were relatively high but variable throughout the study. All other divisions were represented by relatively few or no taxa during each sampling period.

c. Spatial Distribution

Numerical abundance and biomass of bottom periphyton decreased with increasing water depth, especially during periods when peak densities were observed (Tables IV-C 2 and IV-C 3). A comparison of the data from experimental (NMPP and FITZ transects) and control (NMPW and NMPE) areas indicated that bottom periphyton in both areas exhibited the same temporal trend, but densities and biomass were slightly higher in the experimental area during spring, early summer, and again in late fall. During mid-summer, densities and biomass were highest in the control area, while in the early fall both areas were quite similar (Tables IV-C 2 and IV-C 3). Although natural variability of the data caused problems in directly assessing thermal effects, it appears that thermal discharges from the power plants stimulated growth of bottom periphyton except during mid- and late summer.

2. Suspended Periphyton

a. Species Composition

Taxa from eight algal divisions were collected from substrates suspended at 2-, 7-, 12-, and 17-foot depths on the 40-foot contour from early May through September 1977 (Table IV-C 4). Blue-green algae (Cyanophyta) were most abundant followed by diatoms (Bacillariophyta) and green algae (Chlorophyta). All other divisions combined accounted for less than 1 percent of the total numbers present.

During the study 127 taxa were collected, including 17 taxa with at least 1 percent relative abundance (by number) during any one sampling month (Appendix Tables C-7 and C-8). The other 110 taxa combined accounted for only 5 percent of the total periphyton population.

Table IV-C 4

Percent Relative Abundance (by Number) of Suspended Periphyton Collected on Artificial Substrates, Nine Mile Point Vicinity, 1977

Division	Spring 2-25 May	Late Spring 25 May-6 Jul	Early Summer 6-27 Jul	Mid-Summer 27 Jul-2 Sep	Late Summer 2-30 Sep	Annual Mean
Cyanophyta	0	3	88	92	81	62
Chlorophyta	14	26	8	5	3	11
Euglenophyta	T*	T	0	T	0	T
Xanthophyta	0	0	0	T	0	T
Chrysophyta	T	T	T	0	0	T
Bacillariophyta	81	71	3	3	16	27
Pyrrhophyta-Dinophyceae	1	T	T	T	0	T
Cryptophyta	4	T	T	T	T	T
Number of Taxa	68	66	59	57	54	126

*T = < 0.5%.

b. Temporal Distribution

Both density and biomass of suspended periphyton increased between spring and late spring followed by a decrease in early summer (Tables IV-C 5 and IV-C 6). A second peak in densities and biomass occurred during mid-summer. Generally, diatoms were more numerous in the spring, especially Diatoma tenue (Appendix Tables C-11 and C-12), but as the water warmed, blue-green algae became dominant (Table IV-C 4). Green algae were abundant during spring and late spring but were of minor numerical importance during the remaining sampling periods (Appendix Tables C-9 through C-12). All other algal divisions were present during one or more months but in low abundance.

Lyngbya dominated during early and late summer periods (Appendix Tables C-8 and C-13). As previously stated, Lyngbya did not cause problems at either the Nine Mile Point or James A. FitzPatrick power plants during 1977, even though it was one of the most abundant periphyton taxa.

Green algae consistently exhibited a greater diversity of taxa than other divisions; comprising about half of the taxa collected during each sampling period. Diatom and blue-green algal diversity varied throughout the sampling season. All other divisions showed little diversity across sampling periods.

Table IV-C 5

Abundance (No./Square Millimeter) of Suspended Periphyton Collected on Artificial Substrates, Nine Mile Point Vicinity, 1977

TOTAL PERIPHYTON

DEPTH STRATA (FT)	TRAN-SECT	SPRING MEAN	SPRING S.E.*	LATE SPRING MEAN	LATE SPRING S.E.	EARLY SUMMER MEAN	EARLY SUMMER S.E.	MID-SUMMER MEAN	MID-SUMMER S.E.	LATE SUMMER MEAN	LATE SUMMER S.E.
2	NMPW	5086	1547	3045397	276855	NS**		504239	326326	367254	245689
	NMPP	4218	868	1590843	70278	688485	353792	1810202	425929	NS	
	FITZ	36007	24555	1735663	351390	263084	28423	NS		NS	
	STRATA MEAN	15104	10455	2123967	462607	475784	200581	1157220	652982	367254	245689
7	NMPW	41799	40865	470759	37564	NS		6215388	705980	4876113	4308240
	NMPP	3893	166	193053	82737	93900	89641	1212787	1081782	298491	259207
	FITZ	124778	103967	115240	83527	11885	448	NS		199643	134121
	STRATA MEAN	56823	35696	259684	107902	52893	41008	3714088	2501300	1791415	1542612
12	NMPW	3795	1149	262616	49403	NS		83229	50007	11781	11781
	NMPP	2889	635	131224	911	25994	3139	84650	35320	29425	1236
	FITZ	6844	3044	447021	72411	18463	5837	NS		16013	14051
	STRATA MEAN	4509	1196	280287	91590	22229	3765	83940	710	19073	5318
17	NMPW	927	438	44832	4310	NS		2306	621	57585	34975
	NMPP	3329	658	16186	2821	25479	4984	36334	34934	6634	1261
	FITZ	3744	151	50352	6527	6746	1248	NS		3943	67
	STRATA MEAN	2667	878	37123	10589	16113	9366	19320	17014	22721	17449
CONTROL MEAN**		27873	14940	771485	378760	75045	62726	1701290	1508716	790333	682826
EXP. MEAN**		3582	295	482827	371152	208465	160811	785993	436370	110317	92521
MONTHLY MEAN		19776	10326	675266	273985	141755	83788	1243642	747320	586328	478481
MONTHLY RANGE		927—124778		16186—3045397		6746—688485		2306—6215388		3943—4876113	

*STANDARD ERROR
**CONTROL REPRESENTS NMPW AND NMPE, EXPERIMENTAL REPRESENTS NMPP AND FITZ
NS = NO SAMPLES, SUBSTRATES LOST DUE TO WEATHER

Table IV-C 6

Ash-Free Dry Weight (Milligrams/Square ~~Millimeter~~ Decimeter) of Periphyton Collected on Suspended Artificial Substrates, Nine Mile Point Vicinity, 1977

TOTAL PERIPHYTON

DEPTH STRATA (FT)	TRANSECT	SPRING 2-25 MAY MEAN	S.E.*	LATE SPRING 25 MAY - 7 JUL MEAN	S.E.	EARLY SUMMER 7-27 JUL MEAN	S.E.	MID-SUMMER 27 JUL - 2 SEP MEAN	S.E.	LATE SUMMER 2 SEP - 30 SEP MEAN	S.E.
2	NMPW	9.52	0.55	174.45	12.41	NS**		52.49	6.58	79.07	22.05
	NMPP	8.18	1.88	234.56	6.19	21.92	2.60	460.94	3.32	NS	
	FITZ	7.27	0.53	183.39	4.26	28.34	1.73	NS		NS	
	STRATA MEAN	8.32	0.65	197.47	18.72	25.13	3.21	256.71	204.22	79.07	22.05
7	NMPW	6.18	2.73	101.79	14.29	NS		48.74	44.03	66.25	26.46
	NMPP	2.71	0.41	60.00	11.57	17.44	7.59	72.00	1.84	20.55	2.06
	FITZ	6.96†		49.93	7.24	9.47	0.71	NS		41.51	11.14
	STRATA MEAN	5.28	1.31	70.57	15.88	13.45	3.98	60.37	11.63	42.77	13.21
12	NMPW	9.87	6.00	52.79	2.36	NS		17.15	1.61	24.57	14.46
	NMPP	3.17	0.91	28.34	2.33	19.41	0.96	40.10	11.19	58.36	15.98
	FITZ	4.60	0.01	113.49	15.97	9.62	0.45	NS		10.94	4.95
	STRATA MEAN	5.88	2.04	64.87	25.31	14.51	4.89	28.62	11.47	31.29	14.09
17	NMPW	5.24	1.37	20.88	2.16	NS		5.01	4.62	21.05	0.25
	NMPP	4.56	1.09	40.25	17.23	22.85	2.07	100.85	32.42	13.63	1.85
	FITZ	5.65	0.22	27.01	0.50	13.87	3.71	NS		11.37	2.26
	STRATA MEAN	5.15	0.32	29.38	5.72	18.36	4.49	52.93	47.92	15.35	2.92
SAMPLE PERIOD MEAN		6.16	0.74	90.57	36.78	17.86	2.64	99.66	52.79	34.73	7.90
CONTROL MEAN††		7.70	1.17	87.48	33.43	1.00	1.00	30.85	11.70	47.74	14.64
EXP. MEAN††		5.39	0.70	92.12	27.67	17.87	2.35	168.47	98.28	26.06	7.98
MONTHLY MEAN		6.16	0.66	90.57	20.66	17.87	2.35	99.66	52.68	34.73	7.90
MONTHLY RANGE		2.71-9.87		20.88-234.56		9.47-28.34		5.01-460.94		10.94-79.07	

*STANDARD ERROR

**NO SAMPLES, SUBSTRATES LOST DUE TO WEATHER

†DATA FOR ONE REPLICATE LOST

††CONTROL REPRESENTS NMPW, EXPERIMENTAL REPRESENTS NMPP AND FITZ

c. Spatial Distribution

Generally, total algal numbers decreased with an increase in water depth (Table IV-C 5), except during the mid-summer when highest densities were observed at the 7- rather than the 2-foot depth strata. Biomass of suspended periphyton was always highest at the 2-foot water strata and usually decreased with depth (Table IV-C 6). During the period of peak densities in August, blue-green algae, green algae, and diatoms were most numerous at the 7-foot depth contour. Euglenophyta and Chrysophyta were most abundant at the 17-foot depth strata.

Only during mid- and late summer was there a noticeable difference between periphyton densities in the experimental and control areas. During these months, periphyton concentrations on the artificial substrates in the control area (NMPW and NMPE transects) were about twice the concentrations on substrates from the experimental area. During the remainder of the sampling season, however, the experimental and control areas were similar in terms of both abundance and biomass. Thermal discharges from the power plants may have depressed growth of periphyton in the areas near the plumes during the summer, but otherwise appeared to have no noticeable effect.

D. BENTHIC INVERTEBRATES

1. Description of Bottom Sediment

Visual observation of the bottom sediments in the vicinity of Nine Mile Point indicated that the area is primarily bedrock covered in some areas with boulders and rubble (Table IV-D 1).

Table IV-D 1

Composition of Bottom Sediment Determined by Visual Examination at Benthic Sampling Stations in the Vicinity of Nine Mile Point, 1977

Depth Contour (ft)	Transect	Description*	Comments
10	NMPW	100% bedrock	
	NMPP	70% boulders, 20% rubble, 10% gravel	Some algae on rocks
	FITZ	80% boulders, 10% gravel, 10% sand	Some algae
	NMPE	70% boulders, 20% gravel, 10% sand	Some algae
20	NMPW	50% bedrock, 50% rubble	
	NMPP	50% boulders, 30% rubble, 20% gravel	All lying on bedrock
	FITZ	50% boulders, 20% gravel, 20% rubble, 10% sand	
	NMPE	40% bedrock, 30% boulders, 25% gravel, 5% sand	
30	NMPW	100% bedrock	Some rubble
	NMPP	100% bedrock	Some boulders
	FITZ	80% bedrock, 20% rubble	Some sand
	NMPE	100% bedrock	Some rubble and sand
40	NMPW	50% bedrock, 30% rubble, 20% sand	
	NMPP	80% boulders, 20% bedrock	
	FITZ	50% bedrock, 20% boulders, 50% rubble	
	NMPE	100% bedrock	Some scattered sand
60	NMPW	100% bedrock	
	NMPP	80% boulders, 10% rubble, 10% gravel	
	FITZ	80% bedrock, 20% boulders	Some rubble
	NMPE	80% bedrock, 20% rubble	Some sand

*Description based on USEPA (1973) field evaluation method for categorizing soils.

2. Species Composition

Fifty-nine (59) taxa of benthic invertebrates were collected during the 1977 study (Appendix Table D-1), and 17 of these each accounted for at least 1 percent of the total number collected during any one sampling month. The most abundant group was scuds (Amphipoda), which accounted for about 56 percent of all the benthic invertebrates collected during 1977 (Table IV-D 2). Aquatic earthworms (Oligochaeta) were second most abundant, while polychaete worms and immature flies (Diptera) were third and fourth in relative abundance for the year, respectively. All other groups combined accounted for only 10 percent of the total population present (Table IV-D 2).

Table IV-D 2

Percent Composition of Benthic Invertebrate Groups (by Number) and Total Density of Benthic Organisms Collected by Suction Sampler in the Vicinity of Nine Mile Point, 1977

	4-5 May						7-12 July						2-9 September						31 October - 2 November						
	Depth Contours (ft)						Depth Contours (ft)						Depth Contours (ft)						Depth Contours (ft)						
Summary Groups	10	20	30	40	60	Site Mean	10	20	30	40	60	Site Mean	10	20	30	40	60	Site Mean	10	20	30	40	60	Site Mean	Annual Mean
Coelenterata	15.2	2.6	2.4	T*		2.8	1.9	4.9	2.5	0.5	0.1	1.4			0.1	0.1		T	0.9	7.7	1.3	0.6	0.1	1.8	1.4
Platyhelminthes	1.9	1.2	0.1			0.3	0.1	0.9	1.3	0.3	1.7	1.0	0.2	0.9	0.4	0.8	0.6	0.5	0.3	0.4	2.0	4.3	2.1	1.8	1.0
Nemertea																			0.1	0.2	0.5	0.1		0.2	0.1
Nematoda	0.8	2.6	2.3	0.8	4.5	2.2	0.5	0.9	3.5	1.4	6.8	3.6		0.1	4.2	3.0	4.7	1.4		T	0.7	0.2	4.2	0.9	1.8
Polychaeta	27.4	53.9	22.9	32.8	0.5	22.2	0.2	5.2	4.8	0.3	0.2	1.7	0.1	7.6	4.8	0.3	0.1	1.5	4.8	14.5	39.1	3.7	1.1	12.7	7.8
Oligochaeta	5.2	0.9	52.1	42.5	61.6	42.5	43.9	42.2	34.6	27.8	28.5	33.0	T	2.6	26.7	36.5	20.3	10.8	0.2	0.7	7.5	35.5	25.5	13.1	20.1
Hirudinae																					0.1	T		T	T
Gastropoda	1.0	0.3	0.4	3.7	2.2	2.1	2.6	1.6	2.0	1.1	1.9	1.8	1.2	5.1	7.2	2.1	1.5	2.3	1.8	4.3	2.9	5.0	9.6	4.3	2.8
Pelecypoda	0.5		0.1	4.9	0.8	1.9	0.1	0.4	1.9	1.6	1.9	1.5	T	0.2	9.0	4.0	1.5	1.4		0.0	1.4	10.0	7.3	3.5	2.4
Hydracarina	0.2	0.9	0.2		0.3	0.2		0.3	1.7	2.2	0.2	0.9			0.1	T	T	T	0.3	0.4	1.3	1.8	0.5	0.9	0.6
Isopoda	0.2									T		T				0.9		0.1			T	0.1		T	T
Amphipoda	42.9	30.1	16.9	11.6	28.6	22.6	28.1	25.6	41.6	59.2	53.1	45.9	98.4	81.1	41.6	18.5	42.4	71.7	91.5	70.7	41.5	33.7	43.8	58.4	55.8
Decapoda	0.2					T		0.1		0.1	T	T													T
Ephemeroptera	0.2					T				T		T								T				T	T
Trichoptera							0.1	0.4	0.1	0.1	0.0	0.1								T	T			T	T
Diptera	4.4	7.5	2.8	3.8	1.5	3.2	22.2	17.3	6.0	5.3	5.3	8.8	T	2.4	5.8	33.6	28.8	10.2	0.1	0.8	1.7	4.9	5.7	2.4	6.5
Bryozoa								0.1	T		T	T				0.1		T	T	0.1	0.1	0.1	T	0.1	T
Total Density (No./m^2)	807	259	1197	1880	1534	1136	1030	951	1722	1697	3048	1690	7413	2237	851	2529	2019	3010	3760	1924	2827	2784	2078	2684	2130

*T = <0.1%

Freshwater clams (Pelecypoda) accounted for 53 percent of the benthic wet-weight biomass for the year (Table IV-D 3). Scuds were second by weight and snails (Gastropoda) were third. All other groups combined accounted for only 12 percent of the total biomass collected.

3. Temporal Distribution

The number of invertebrates per area of substrate steadily increased from early May until early September (Table IV-D 2 and Figure IV-D 1), then declined slightly by early November. Aquatic earthworms and polychaete worms were dominant in early May whereas scuds were dominant during the remaining months. Two species of scuds, Gammarus fasciatus and Pontoporeia affinis, dominated this group; P. affinis was most abundant during July while G. fasciatus was dominant during September and November (Appendix Table D-1). Polychaete worms were prevalent in early May and early November but were of minor importance during July and September. Immature flies were found in maximum numbers during July and September but were of minor importance during May and November. All other groups combined had relatively stable numbers from sampling period to sampling period. Taxa that represented more than 1 percent of the total abundance during any one month of sampling usually were present on all sampling dates, while less abundant taxa occurred sporadically (Appendix Table D-1).

Total biomass, excluding the relatively heavy freshwater clams (Pelecypoda), increased from May through September (Figure IV-D 2 and Table IV-D 3). The biomass of snails (Gastropoda) and scuds (Amphipoda) remained stable between early May and July, then both exhibited substantial increases during September. Snails and scuds continued to account for much of the biomass between September and early November. The combined weight of the other taxa (Figure IV-D 2) increased from early May to July due primarily to the presence of crayfish (Decapoda), then declined after July. These fluctuations in weight are directly related to the number and size of the individuals most susceptible to the sampling gear during any one sampling period.

Table IV-D 3

Percent Composition of Benthic Invertebrate Groups (by Wet Weight) and Total Biomass of Benthic Organisms Collected by Suction Sampler in the Vicinity of Nine Mile Point, 1977

	4-5 May						7-12 July						2-9 September						30 October - 2 November						
	Depth Contours (ft)					Site	Depth Contours (ft)					Site	Depth Contours (ft)					Site	Depth Contours (ft)					Site	Annual
Summary Groups	10	20	30	40	60	Mean	10	20	30	40	60	Mean	10	20	30	40	60	Mean	10	20	30	40	60	Mean	Mean
Coelenterata	1.3	T*	T	T		0.1	0.4	0.9	38.0	T	T	7.5			T	T		T	T	0.4	0.1	T	T	0.1	0.8
Platyhelminthes	0.1	1.6	T			T	T	0.4	0.3	T	0.6	0.2	T	0.2	T	0.2	0.2	T	0.1	0.1	1.1	2.2	0.6	0.7	0.1
Nemertea																			T	T	T	T			T
Nematoda	T	T	0.1	T	0.1	T	T	T	0.1	T	0.6	0.1	T		T	0.3	0.5	T	T		T	T	0.1	T	T
Polychaeta	2.1	4.1	2.5	0.2	T	0.4	T	0.2	0.1	T	T	T	T	0.3	T	T	T	T	T	0.5	3.4	0.1	T	0.5	0.2
Oligochaeta	0.4	0.8	50.4	1.6	24.2	3.4	3.7	1.5	11.1	9.2	20.6	10.9	T	0.5	1.2	16.2	12.3	2.3	T	0.2	3.1	6.2	8.4	2.9	3.6
Hirudinae																					T				T
Gastropoda	8.2		14.6	2.4	12.4	3.7	18.2	72.9	17.0	3.7	19.7	13.7	19.3	75.3	2.0	20.5	18.4	11.5	31.5	77.4	54.6	24.6	35.7	41.5	14.7
Pelecypoda	7.1		3.9	93.4	7.1	77.8	1.1	2.0	11.3	18.4	28.3	17.0	T	0.4	96.1	15.1	13.7	61.5		T	9.1	41.2	23.6	12.4	52.9
Hydracarina	T	T	T		T	T		T	T	T	T	T			T	T	T	T	T	T	0.1	T	T	T	T
Isopoda	T									T		T				0.2		T			T	T		T	T
Amphipoda	17.1	88.6	25.9	2.3	55.3	7.2	69.1	8.2	17.1	9.4	28.3	17.1	80.6	23.1	0.7	10:0	27.7	21.1	68.3	20.9	27.7	18.9	29.6	40.1	20.0
Decapoda	62.7					7.0		9.9		58.7	0.1	31.3													5.3
Ephemeroptera										0.1		T								T				T	T
Trichoptera	T					T		1.1	0.1		0.1	0.1								T	0.2			T	T
Diptera	0.3	4.1	2.2	0.2	0.8	0.3	7.6	3.3	1.6	0.2	1.3	1.2	T	0.2	T	37.3	27.2	3.5	T	0.1	0.5	0.8	1.8	0.5	1.8
Bryozoa									3.3		0.1	0.7				T		T	T	0.2	0.2	0.1	0.1	0.1	0.1
Total Biomass (grams/m²)	4.45	0.12	0.68	32.61	1.92	7.97	0.75	0.84	2.93	7.86	2.65	3.01	13.74	3.37	39.26	3.90	2.70	12.59	8.89	4.20	2.70	4.34	4.24	4.88	35.53
Total Biomass without Pelecypoda	4.13	0.12	0.65	2.15	1.78	1.77	0.74	0.82	2.60	6.41	1.90	2.50	13.74	3.36	1.53	3.31	2.33	4.85	8.89	4.20	2.45	2.55	3.24	4.27	16.73

*T = <0.1%

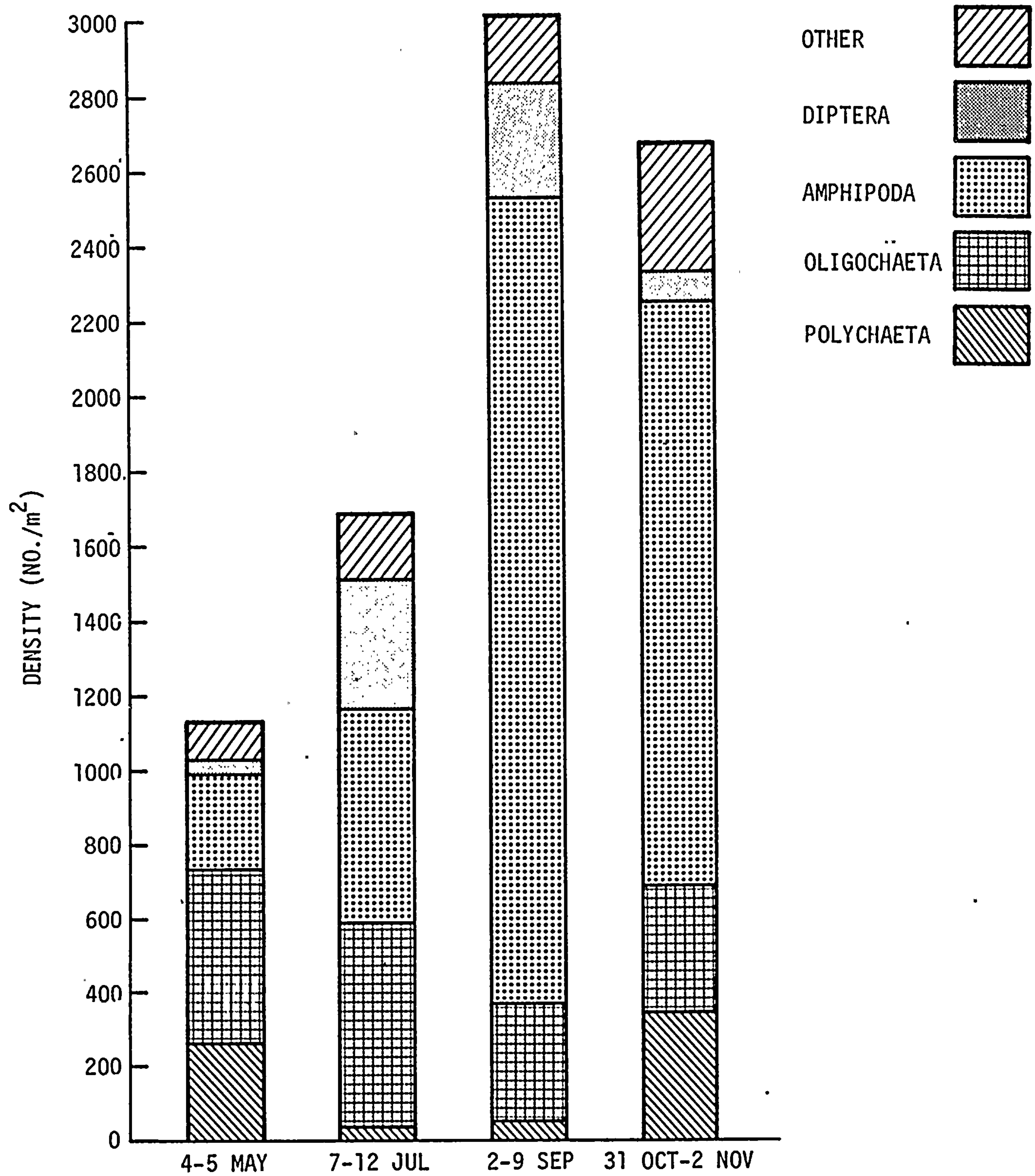


Figure IV-D 1. Temporal Distribution in Abundance of Benthic Invertebrate Groups Collected in the Vicinity of Nine Mile Point, 1977 (Samples not taken in December due to weather.)

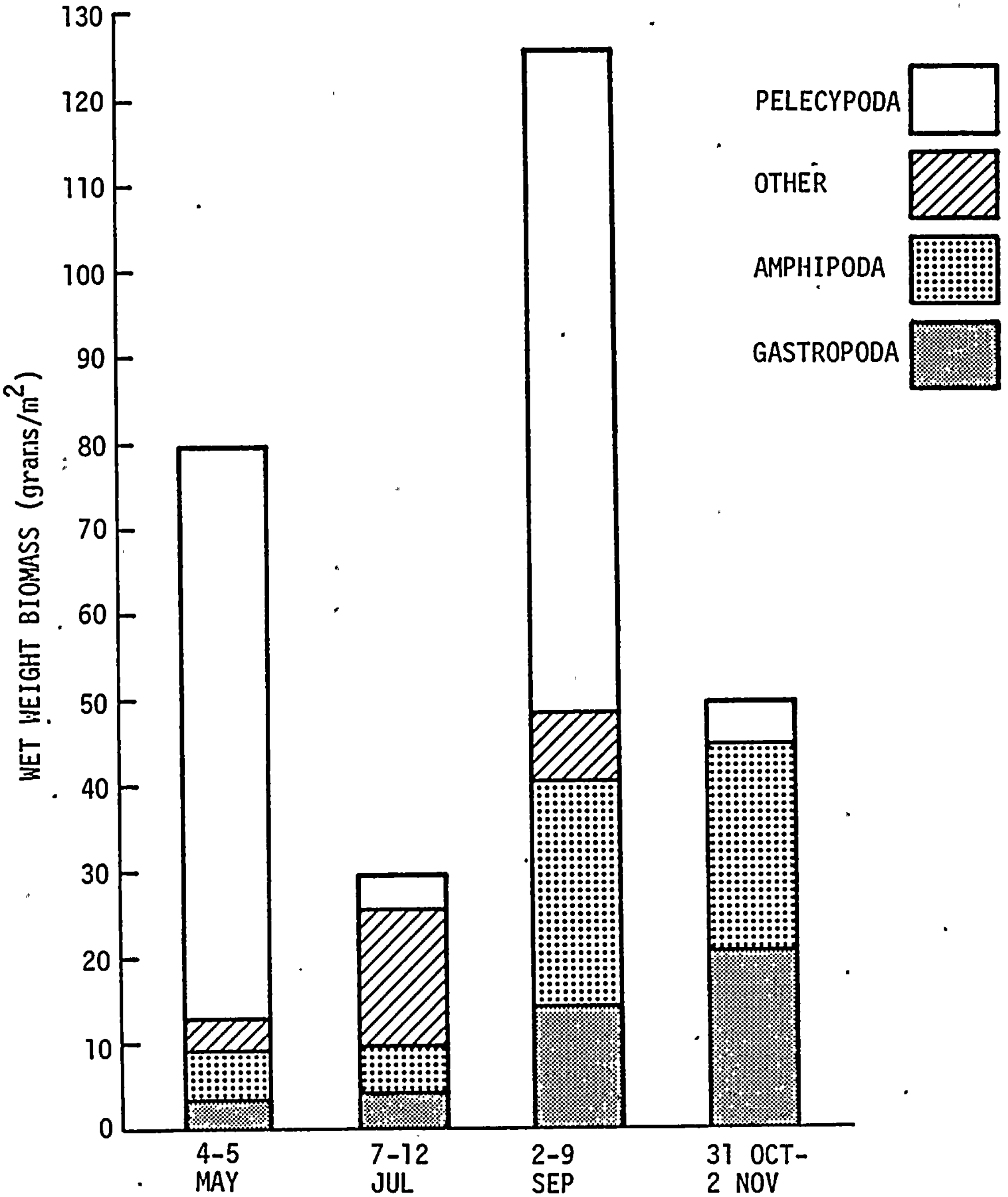


Figure IV-D 2. Temporal Distribution in Biomass of Benthic Invertebrate Groups Collected in the Vicinity of Nine Mile Point, 1977 (Samples not taken in December due to weather.)

4. Spatial Distribution

During the first two sampling periods (May and July), total densities were relatively low at the 10- and 20-foot depth contours and higher at the 30-, 40-, and 60-foot contours (Table IV-D 2). Densities at the 10-foot contour increased significantly after July, and highest total densities during September and early November were at the 10-foot depth contour. Densities at the 20-foot contour also increased after July, but only to levels comparable to the 30-, 40-, and 60-foot contours. Invertebrate abundance at the 40-foot contour exhibited the least fluctuation through the sampling season, with densities ranging from about 1700 to 2800 organisms per square meter (Table IV-D 2 and Appendix Table D-2).

In 1977, scuds (all species combined) were distributed throughout the study area (Appendix Table D-3). They were generally more numerous at deeper contours in May and July and at shallower depths in September and November. There was a general increase in numbers from west to east in water deeper than 10 feet. However, high variation in scud numbers observed at stations within the control (NMPW and NMPE) and experimental (NMPP and FITZ) areas precluded detection of differences between these two areas. *Gammarus fasciatus* and *Pontoporeia affinis* dominated benthic collections in July, September, and November, and were widely distributed over the area (Appendix Tables D-4 and D-5). *G. fasciatus* exhibited a preference for shallow depth contours while *P. affinis* was most abundant at deeper zones. At the 30-, 40-, and 60-foot contours, *P. affinis* exhibited an increase in numbers from west to east.

Polychaete worms exhibited large differences in numbers among stations in the vicinity of Nine Mile Point during 1977 (Appendix Table D-6 and Table IV-D 2), and no spatial distribution patterns were apparent.

Aquatic earthworms were generally more numerous in water greater than 20 feet in depth (Appendix Table D-7) and a general increase in their numbers from west to east was observed at the 30- and 40-foot depths. The sample period mean for the control area was usually higher than for the experimental area, but numbers at stations within each area were highly variable.

Immature flies were evenly distributed over the entire study area (Appendix Table D-8).

In general, benthic invertebrates were distributed over the entire study area and high natural variability in densities among stations was observed. There was a trend for scuds and aquatic earthworms densities to increase from west to east, especially in deeper waters; but no spatial distribution pattern that could be attributable to plant operations was detected.

E. ICHTHYOPLANKTON

1. Species Composition

Eggs of five taxa and larvae (prolarvae and postlarvae combined) of 22 taxa were collected from Lake Ontario in the Nine Mile Point vicinity during 1977 (Table IV-E 1). Samples taken during early April (weather precluded sampling the first week) yielded only burbot and lake herring (cisco) larvae. During May, larvae of early spring spawners such as walleye, yellow perch, and rainbow smelt were collected along with burbot larvae and smelt and minnow eggs. The highest diversity (number of taxa) of ichthyoplankton occurred during June, July, and August; 15 taxa of larvae were present during each of these months. After September only alewife and rainbow smelt larvae were captured in the study area, and no ichthyoplankton were caught from late November through December.

2. Temporal Distribution

a. Eggs

Fish eggs were collected in the study area from 23 May through 29 July with five species represented (Table IV-E 2). Smelt eggs, which are adhesive and demersal, were taken in benthic samples in early May in addition to those collected with the one-meter diameter ichthyoplankton net in late May. Minnow and alewife eggs were the most abundant in the 1977 samples; most minnow eggs were collected in mid-May and peak densities of alewife eggs occurred during mid-July.

Alewife egg densities were higher in night than day samples, perhaps the result of greater spawning activity during the night [Lawler, Matusky, and Skelly (LMS) 1975a]. The low catches for the other species did not exhibit any day-night trends.

b. Larvae

Larvae were present in ichthyoplankton samples from mid-April, when the first samples were taken, through most of November (Table IV-E 1). Both prolarvae (the yolk-sac stage) and postlarvae (post yolk-sac) were collected during the earliest sampling periods but prolarvae, the more ephemeral of these two stages, were common only through early August (Table IV-E 3).

Table IV-E 1

Seasonal Occurrence of Fish Eggs and Larvae Collected in the Vicinity of Nine Mile Point, Lake Ontario, April-December 1977

Species[1]	Apr[2] 1	Apr 2	Apr 3	Apr 4	May 1	May 2	May 3	May 4	May 5	Jun 1	Jun 2	Jun 3	Jun 4	Jul 1	Jul 2	Jul 3	Jul 4	Aug 1	Aug 2	Aug 3	Aug 4	Aug 5	Sep 1	Sep 2	Sep 3	Sep 4	Oct 1	Oct 2	Oct 3	Oct 4	Nov 1	Nov 2	Nov 3	Nov 4	Nov 5
Alewife													E	E	E	E	E[3]																		
										L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L		L	L	L	L	L	L	L		
Burbot		L		L	L	L	L			L	L																								
Carp												E			E																				
											L	L	L	L	L	L	L	L	L																
Emerald shiner																		L		L	L		L												
Freshwater drum														E	E	E																			
																L	L	L																	
Goldfish												L	L	L	L	L	L	L	L			L	L												
Gizzard shad										L	L	L	L		L		L	L																	
Herring, unid.[4]													L	L	L	L	L	L	L	L	L	L	L												
Johnny darter										L	L	L	L	L	L	L	L	L	L	L															
Lake herring		L	L	L																															
Log perch													L	L																					
Minnows, unid.[5]								E	E		E	E	E		E																				
											L	L	L	L	L	L	L	L	L	L	L														
Morone sp.[6]						L				L	L	L	L	L	L	L	L	L	L	L															
Rainbow smelt								E																											
						L	L	L	L	L	L	L	L	L	L	L		L	L	L	L	L	L	L		L					L				
Sculpin, unid.											L	L	L	L	L	L		L																	
Sunfish, unid.									L	L	L	L	L	L	L	L	L	L	L	L															
Threespine stickleback														L	L	L			L	L															
Trout-perch										L	L	L	L		L	L																			
Walleye				L	L	L																													
White perch														L	L			L	L	L	L	L	L												
White sucker						L																													
Yellow perch				L	L	L	L	L	L	L	L	L	L																						

1. Common names are those recognized by the American Fisheries Society (Bailey et al 1970).
2. Weeks of the month.
3. E = eggs, L = larvae (prolarvae and postlarvae combined).
4. Includes species of Clupeidae, most are probably alewife.
5. Includes species of Cyprinidae, excluding carp and goldfish.
6. Most *Morone* are probably white perch.

Table IV-E 2

Temporal Distribution in Density* of Fish Eggs Collected in the Vicinity of Nine Mile Point, Lake Ontario, April-December** 1977

	May 23 D[#]	May 31 D	Jun 11 D	Jun 10-12 N[#]	Jun 14 D	Jun 13-14 N	Jun 20 D	Jun 23 N	Jun 27 D	Jun 27 N	Jul 9 D	Jul 7 N	Jul 13-15 D	Jul 14-15 N	Jul 18 D	Jul 18 N	Jul 28-29 D	Jul 28 N
Alewife	←			NO CATCH					→	4.5	0.2	94.2	30.8	486.2	0.9	1113.5	0	26.3
Carp	←			NO CATCH			→	3.2	←		NO CATCH		→	0.6	←	NO CATCH		→
Freshwater drum	←			NO CATCH						→	0.1	0	0.3	0	1.5	0.2	0	0
Minnows	122.6	0.4	0	0	0	0.2	0.1	0.1	0	0.4	0	0	0	0.4	0	0	0	0
Rainbow smelt	0.2	←								NO CATCH								→
Unidentified	0	0	0.2	0	0	0	0.1	0	0	0.1	0.1	0	0.3	0	0	0	0.1	0
Total	122.8	0.4	0.2	0	0	0.2	0.2	3.3	0	5.0	0.4	94.2	31.4	487.2	2.4	1113.7	0.1	26.3

*Mean Density (No./1000 m^3) of all surface, mid-depth, and bottom tows at 15 stations.

**No fish eggs collected during April or after July.

[#]D = day; N = night.

Table IV-E 3

Relative Numerical Abundance (%) of Eleven of the Most Abundant Prolarvae and Postlarvae Collected in the Vicinity of Nine Mile Point, Lake Ontario, April-December 1977

	Apr[8]				May					Jun								Jul							
	1	2	3	4	1	2	3	4	5	1		2		3		4		1		2		3		4	
	D[7]	D	D	D	D	D	D	D	D	D	N[7]	D	N	D	N	D	N	D	N	D	N	D	N	D	N
Prolarvae																									
Alewife[1]													1	6	12	42	11	94	11	85	25	100	89	93	59
Burbot				4	1																				
Carp and Goldfish													3	6	8	31	48		21	12	15	T	3	1	27
Johnny darter											4		5		4		6	1	43	1	55		5	6	13
Lake herring		100	100																						
Minnows[2]															2		2				1		T		
Morone sp.[3]										100	75	100	82	88	67	27	4	4	15	1	1	T	2		1
Rainbow smelt						4	46	100	34				2		4		T								
Sculpin[4]													1		2		27		9		T				
Trout-perch											2		4		1		2				1		T		
Yellow perch				91	97	94	54		66		18		2												
Postlarvae																									
Alewife											1		T	2	1	28	7	99	39	98	97	99	96	96	84
Burbot		68	0	95	79	5	2	0	0	2	1	1	T		T	1									
Carp and Goldfish														T		4	3		3	1	T	T	1		T
Johnny darter																			2		1		1		T
Lake herring		32	0	5																					
Minnows																	T		1				T		T
Morone sp.										39	31	10	17	7	3	2	3	T	7	1	T	1	1	3	3
Rainbow smelt						T		90	94	57	64	87	81	89	94	58	83		28		T		T		
Sculpin															T		3		18		1		T		
Sunfish									6	2	1	0	1	T	0	1	0	T	0	T	T	T	T	T	T
Yellow perch				T	21	95	98	10	0	0	0	2	T	2	2	3	T								

	Aug										Sep						Oct				Nov				
	1		2		3		4		5		1		2		3	4	1	2	3	4	1	2	3	4	5
	D	N	D	N	D	N	D	N	D	N	D	N	D	N	D	D	D	D	D	D	D	D	D	D	D
Prolarvae																									
Alewife[1]	67	T[5]																							
Burbot																									
Carp and Goldfish	33	99	100	77						100															
Johnny darter		1		19																					
Lake herring																									
Minnows[2]		1		4																					
Morone sp.[3]																									
Rainbow smelt																									
Sculpin[4]																									
Troup-perch																									
Yellow perch																									
Postlarvae																									
Alewife	96	97	97	99	95	98	99	96	100	97	96	99	100	94	100		100	100	100	100	91	100	100		
Burbot																									
Carp and Goldfish	T	T	1	T																					
Johnny darter		T				T																			
Lake herring																									
Minnows		T		T		T																			
Morone sp.	3	2	1	1	1	1		T		T	1														
Rainbow smelt	T	T	T	T		T	T	4		3	4	1		6		100					9				
Sculpin																									
Sunfish	T	T	T	T	T																				
Yellow perch																									

[1] Alewife includes the unidentified herring since most Clupeidae in the area were alewives.
[2] Minnows includes the unidentified species of Cyprinidae except for carp and goldfish.
[3] *Morone* includes white perch and white bass.
[4] Sculpin includes the mottled sculpin and potentially the slimy sculpin.
[5] Trace = < 0.5%
[6] No larvae collected during December.
[7] D = day; N = night.
[8] Weeks of the month.

Table IV-E 3 illustrates that for many species, for example yellow perch and alewife, the prolarvae reached their maximum relative abundance at the same time or just prior to the maximum relative abundance of postlarvae.

Highest densities of larvae (all species of prolarvae and postlarvae combined) were observed during late July but three minor peaks occurred prior to July (Figure IV-E 1). These multiple peaks probably resulted from the sequential spawning of several species. The first peak in larvae densities was due primarily to burbot, which accounted for 95 percent of the postlarvae collected on 30 April (Table IV-E 3). Yellow perch prolarvae were also relatively abundant on 30 April but perch accounted for only a small portion of total densities (Figure IV-E 1). Yellow perch larvae accounted for the peak in density on 11 May. Increasing densities of rainbow smelt, primarily postlarvae, accounted for the third minor peak, which occurred in mid-June.

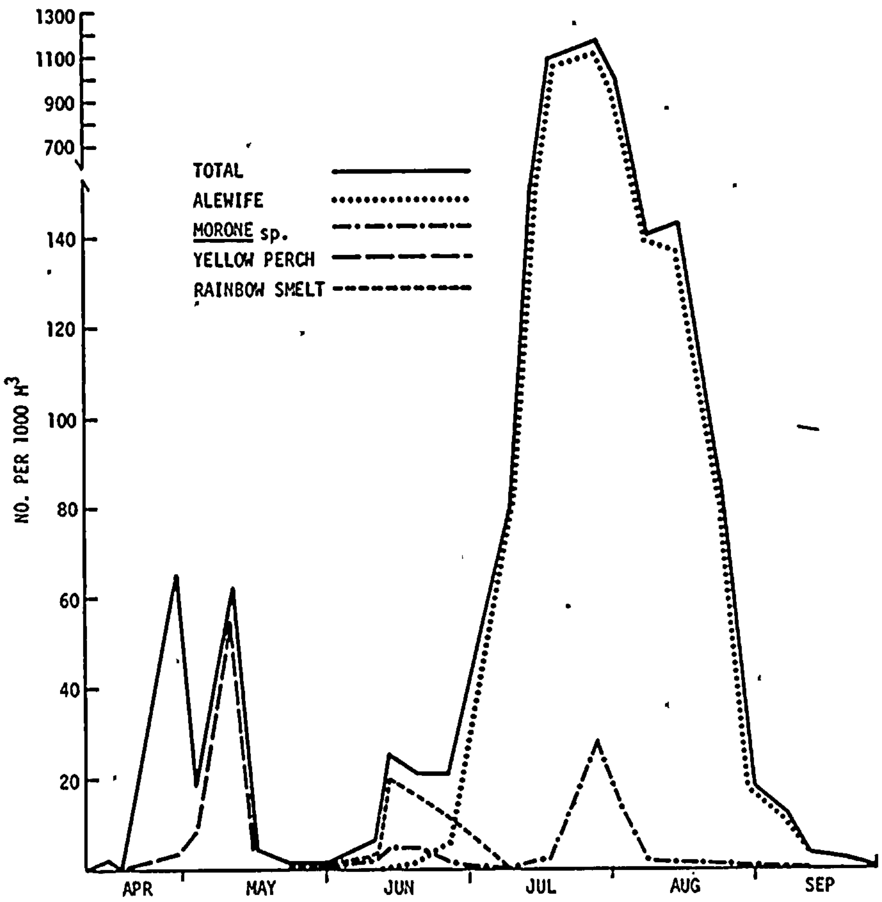


Figure IV-E 1. Temporal Distribution of Larvae Collected during the Day in the Vicinity of Nine Mile Point, Lake Ontario, April-September 1977

Alewife larvae completely dominated the ichthyoplankton population during the summer months with maximum densities occurring during the last two weeks of July (Figure IV-E 1 and Table IV-E 3). Densities of Morone sp. larvae also peaked in late July but density of Morone sp. was overshadowed by the high density of alewife. Larvae densities decreased rapidly during late August, and after mid-September densities never exceeded 5 larvae/1000 m^3.

Day/night sampling showed that larvae densities were higher at night, based on total catch (all species combined), and on catches of the three taxa which were most abundant during the summer months — alewife, rainbow smelt, and Morone sp. (Appendix Tables E-6 through E-40).

There was also a distinct day/night difference in the catches of several species that were not very abundant in the area. These species, including sculpin, johnny darter, trout-perch, and minnows, frequently were present in night collections but rarely found in day samples (Table IV-E 3).

3. Spatial Distribution

a. Eggs

The low catches of eggs prevented analysis of spatial distribution except for alewife (Appendix Tables E-1 through E-5). Alewife eggs were consistently more abundant along the 20- than 40-foot depth contour during night sampling (Appendix Table E-5). There was no consistent trend in the distribution of alewife eggs at stations along the same depth contour (i.e., east to west) nor among the three depth strata (surface, mid-depth, and bottom) (Appendix Tables E-4 and E-5).

b. Larvae

Data collected from June through mid-September were used to illustrate the spatial distribution of fish larvae within the study area because both day and night data were available and total larvae densities were highest during this period. Prolarvae and postlarvae distribution are discussed separately because prolarvae are purely planktonic while postlarvae, as they develop, attain the ability to maintain or change their position in a moving water medium.

Densities of prolarvae (all species combined) decreased from the 20- out to the 100-foot depth contour (Figure IV-E 2). This trend was fairly uniform during both day and night sampling. Catches of postlarvae were also greatest along the 20-foot contour, but postlarvae densities at the 40-, 60-, 80-, and 100-foot contours were relatively equal, especially in day catches (Figure IV-E 3). Larvae of several of the species common in the study area, including smelt and alewife, are known to move farther offshore as they mature. This phenomenon has been observed during previous studies (LMS 1975a, MNPC 1976a). The relatively similar postlarvae densities observed at the deeper depth contours may reflect the initial stages of an offshore movement involving the older postlarvae.

Data from six stations along the 20- and 40-foot depth contours were used to determine the influence, if any, of the two power station discharges on the spatial distribution of larvae (Section III.A.5 and Figure III-A 1). Based on day samples, mean densities of prolarvae along the 20-foot contour were higher at the stations just east and west of the Nine Mile Point discharge (1/2 mile west and 1/2 mile east), but no differences were observed between stations along the 40-foot contour (Figure IV-E 4 and Appendix Tables E-6 through E-10). Night sampling, on the other hand, indicated that the highest average densities were at the stations just to the east (1/2 mile and 1 mile east — downstream with respect to the prevailing current) of the Nine Mile Point and James A. FitzPatrick discharges along both the 20- and 40-foot contours.

The mean station densities of postlarvae exhibited no consistent trend in spatial distribution. Along the 20-foot contour, both the highest and lowest average station densities occurred in the area near the discharges, while catches along the 40-foot contour were fairly uniform (Figure IV-E 5 and Appendix Tables E-20 through E-25).

During June through August when larvae were most abundant, both prolarvae and postlarvae were usually more abundant in surface than mid-depth and bottom samples (Appendix Tables E-6 through E-40). Alewife usually accounted for more than 90 percent of the catches during this period. Yellow perch and rainbow smelt were abundant prior to the influx of alewives. No pattern was observed in the vertical distribution of yellow perch larvae. Highest densities of rainbow smelt larvae, however, were usually observed at the bottom or mid-depth strata (Appendix Tables E-18, E-19, and E-35 through E-40).

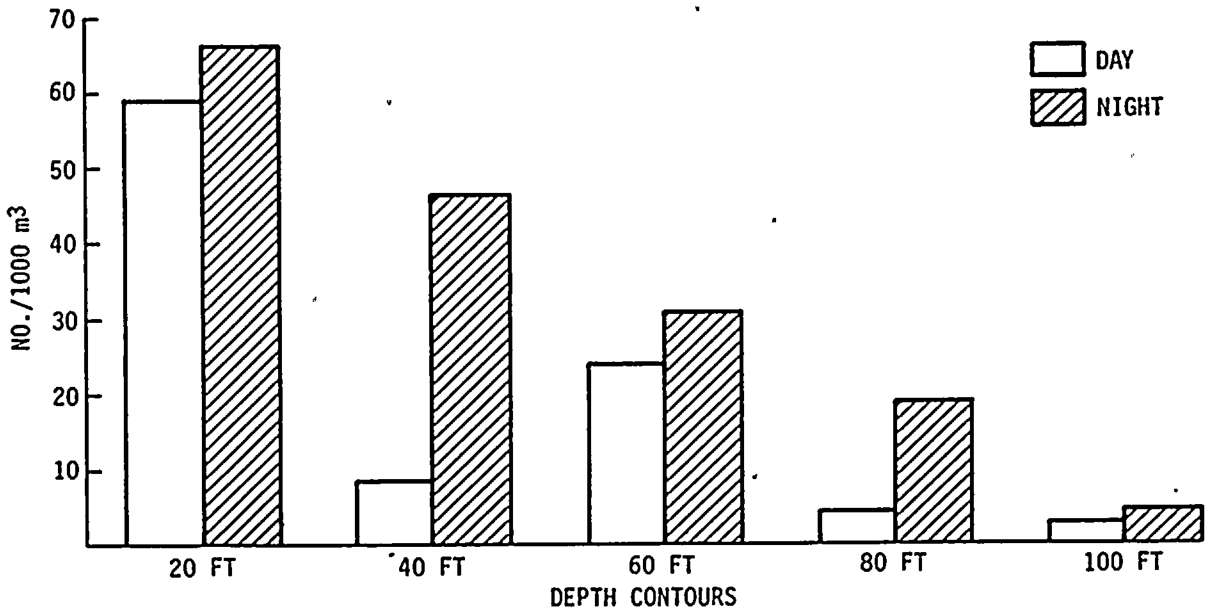


Figure IV-E 2. Distribution of Total Prolarvae Densities in the Vicinity of Nine Mile Point, June through Mid-September, 1977

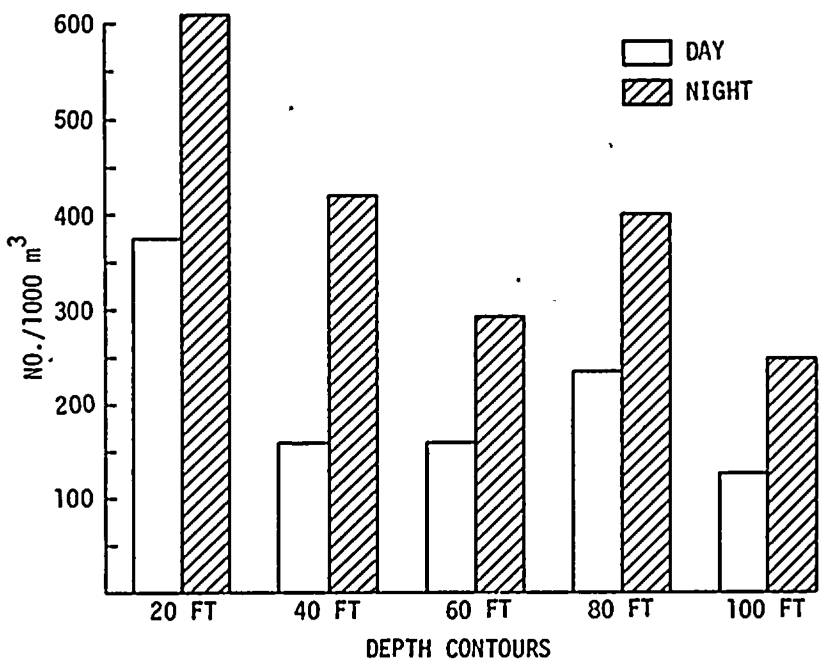


Figure IV-E 3. Distribution of Total Postlarvae Densities in the Vicinity of Nine Mile Point, June through Mid-September, 1977

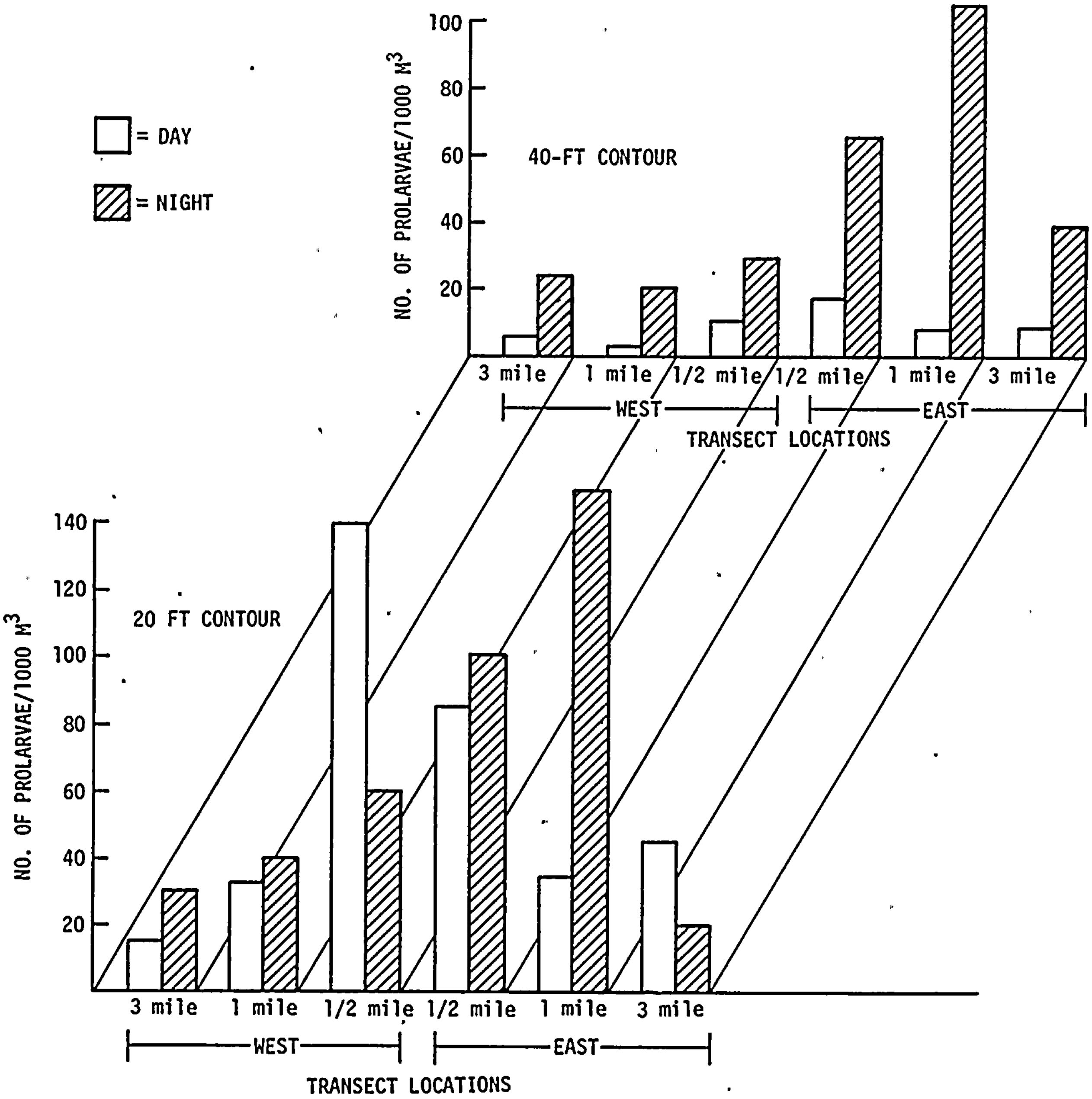


Figure IV-E 4. Spatial Distribution of Prolarvae in the Vicinity of Nine Mile Point, June through Mid-September, 1977

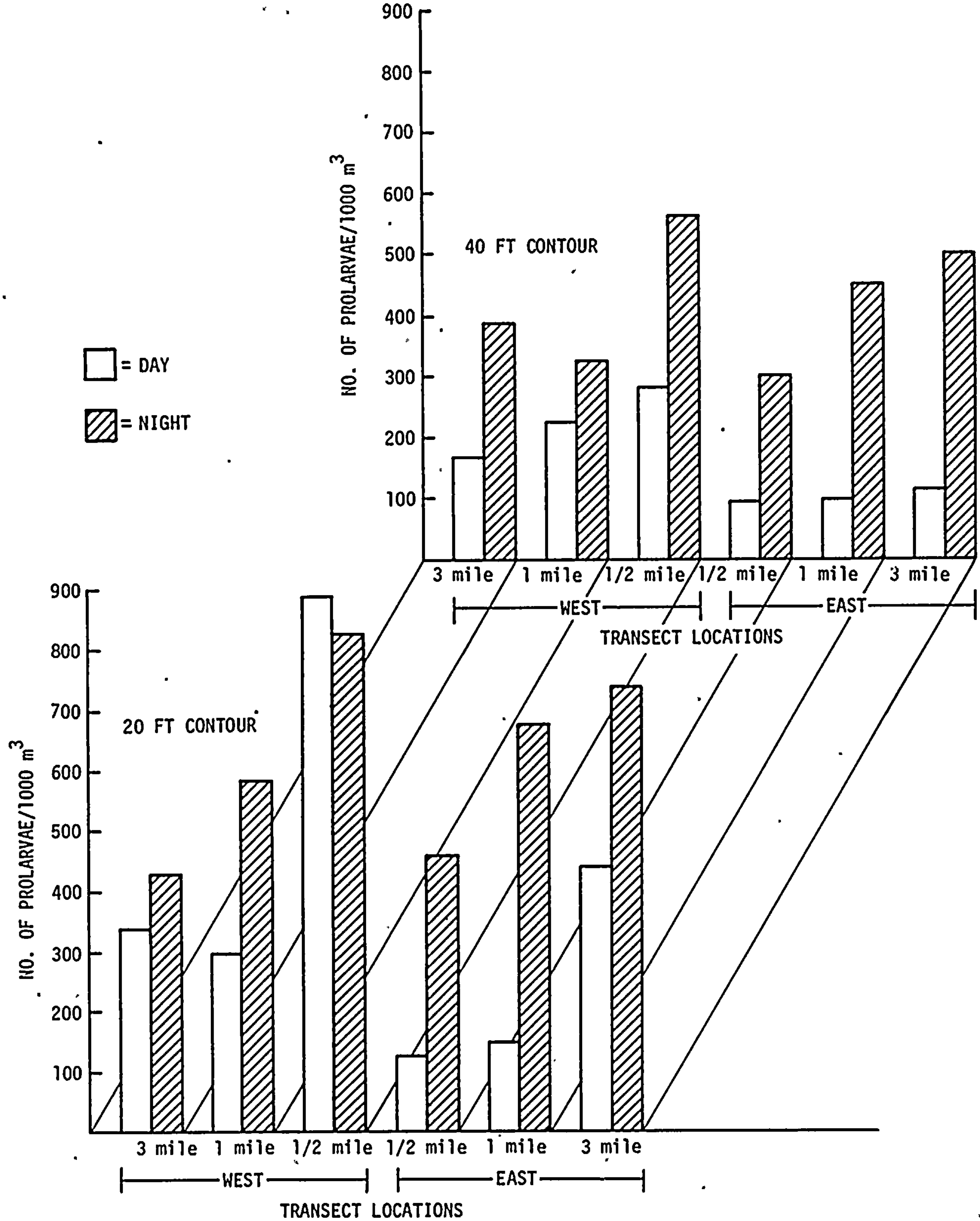


Figure IV-E 5. Spatial Distribution of Postlarvae in the Vicinity of Nine Mile Point, June through Mid-September 1977

F. FISHERIES

1. Species Composition

Thirty-seven species were identified from approximately 46,000 fish collected in the Nine Mile Point Vicinity during 1977 (Table IV-F 1). The highest number and diversity of fish were collected by gill nets while box traps collected the least. Alewife was the dominant fish collected by each gear except the box trap. Rock bass dominated box trap collections. Other abundant species were: spottail shiner, white perch, rainbow smelt, yellow perch, trout-perch, white sucker, white bass, and gizzard shad. These ten species and brown trout, lake chub, rock bass, and smallmouth bass were found during each month of the study, while ten other species were collected during at least four of the eight months (Figure IV-F 1). Adverse weather conditions and ice cover on the lake prohibited sampling in December except by trawl.

2. Temporal and Spatial Distribution

a. Gill Net

Temporal distribtuion of fish collected by gill nets was characterized by peak periods of abundance in May, July and October and low catch rates (catch per 12-hour set) during August and September (Figure IV-F 2). Alewife, rainbow smelt, spottail shiner, white perch, and yellow perch comprised the largest percentage of each monthly catch.

The time required to set and retrieve gill nets at all stations varied during the year with weather conditions and catch sizes, and this generally precluded the use of all data for describing day-night differences (Appendix Table F-1). Therefore, additional effort was made at the 15- and 40-foot depth contours in order to better represent day and night catch rates at these locations. At stations on these two contours, the catch rates were significantly higher at night than during the day (Figure IV-F 3). Additionally, day-night differences appeared to be greater at the shallower depth.

Catch data from both day and night catches (combined) and from the four depth contours sampled with equal effort indicated that fish were more abundant at stations along the 15-foot contour (Figure IV-F 4). Gill net catch rates

Table IV F-1

Numbers and Percent Composition of Fish Collected by Each Sampling Gear, Nine Mile Point Vicinity, 1977

Species*	Gill Net No.	%	Trawl No.	%	Beach Seine No.	%	Box Trap No.	%
Alewife	6,266	25.8	15,928	87.9	1,450	39.2		
American eel	6	T**	2	T				
Bluegill	1	T			1	T		
Brook stickleback			3	T	2	T		
Brown bullhead	53	0.2						
Brown trout	50	0.2	1	T	8	0.2		
Burbot	11	T	1	T	8	0.2		
Carp	3	T						
Chinook salmon	16	T						
Cisco (Lake herring)	1	T						
Coho salmon	9	T						
Cyprinidae	2	T						
Emerald shiner	5	T	1	T	10	0.3		
Freshwater drum	1	T						
Gizzard shad	388	1.2	14	0.1	154	4.2		
Golden shiner					14	0.4		
Goldfish	1	T						
Johnny darter			20	0.1				
Lake chub	132	0.5			1	T		
Lake trout [1]	36	0.1						
Longnose dace					1	T		
Mottled sculpin [1]	20	0.1	10	0.1				
Northern hogsucker	1	T						
Pumpkinseed	2	T						
Rainbow smelt	3,136	12.9	2,003	11.1	1	T		
Rainbow trout	21	0.1			1	T		
Rock bass	204	0.8					178	95.7
Smallmouth bass	133	0.5			1	T		
Splake	133	0.5						
Spottail shiner	6,602	27.1	21	0.1	18	0.5		
Stonecat	119	0.5						
Threespine stickleback	1	T	62	0.3	6	0.2		
Trout perch	783	3.2	15	0.1				
Walleye	2	T			3	0.1		
White bass	311	1.3	18	0.1	349	9.4		
White perch	3,999	16.4	9	T	1,601	43.3	2	1.1
White sucker	563	2.3			23	0.6		
Yellow perch	1,304	5.4	2	T	42	1.1	5	2.7
Total	24,315		18,110		3,694		185	

*Common names according to the American Fisheries Society, Spec. Publ. No. 6, 3rd ed. 1970.

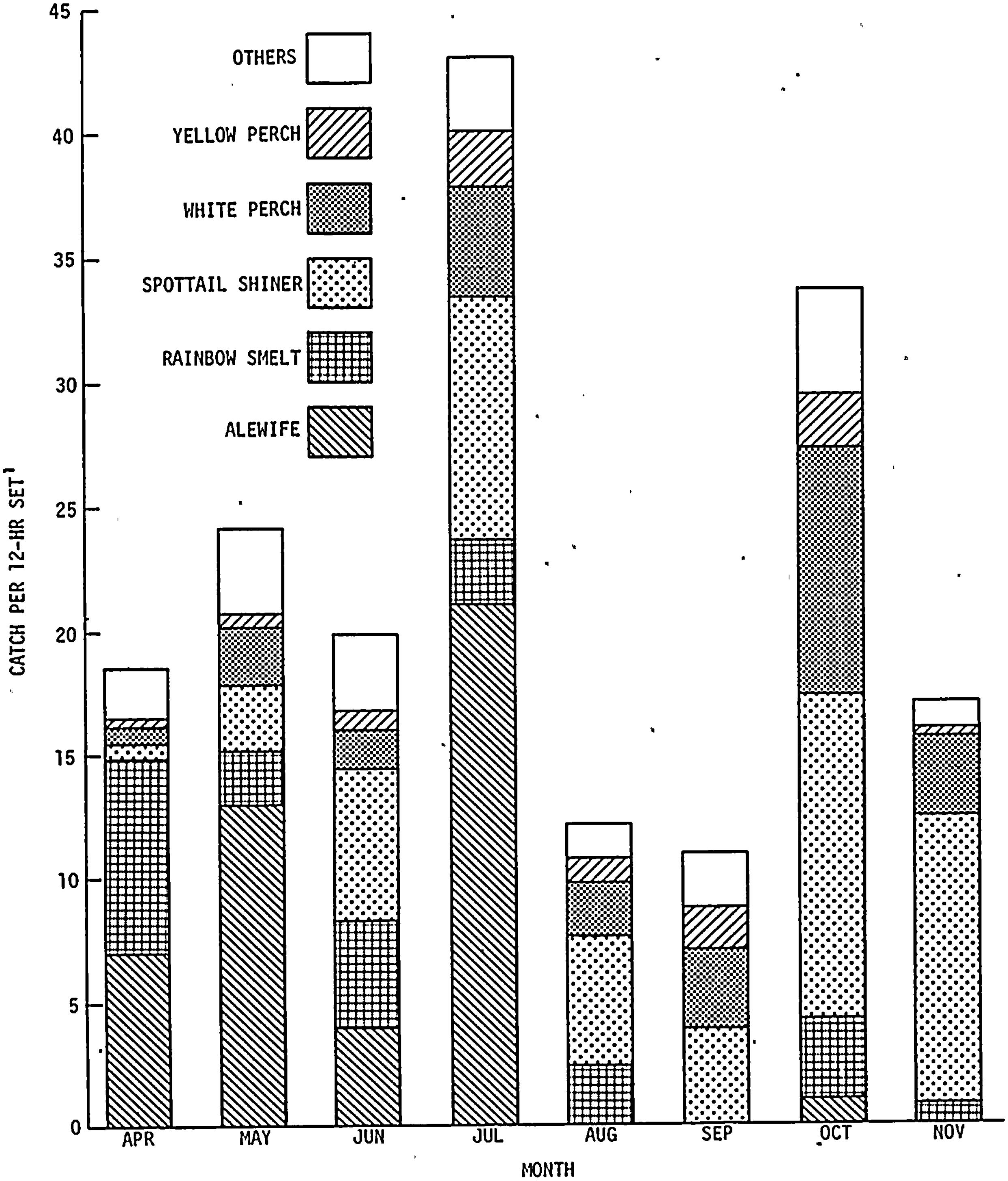
**T = < 0.1%

[1] Species identifications of lake trout and splake and mottled and slimy sculpins are tentative because of overlapping identifying characteristics in current fish identification keys and literature.

SPECIES	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
Alewife	X	X	X	X	X	X	X	X
American eel			X	X	X	X		
Bluegill					X	X		
Brook stickleback	X	X			X			
Brown bullhead		X	X	X	X	X		
Brown trout	X	X	X	X	X	X	X	X
Burbot	X	X	X	X	X			X
Carp							X	
Cisco (Lake herring)						X		
Coho salmon	X		X			X		
Cyprinidae, unidentified	X							
Emerald shiner	X			X		X	X	X
Freshwater drum				X				
Gizzard shad	X	X	X	X	X	X	X	X
Golden shiner		X	X	X				
Goldfish						X		
Johnny darter			X	X				
Lake chub	X	X	X	X	X	X	X	X
Lake trout[1]	X	X	X	X				
Longnose dace				X				
Mottled sculpin[1]	X	X	X					X
Northern hogsucker	X							
Pumpkinseed				X				
Rainbow smelt	X	X	X	X	X	X	X	X
Rainbow trout	X	X	X	X	X	X	X	
Rock bass	X	X	X	X	X	X	X	X
Smallmouth bass	X	X	X	X	X	X	X	X
Splake[1]	X	X	X		X	X	X	X
Spottail shiner	X	X	X	X	X	X	X	X
Stonecat		X	X	X	X	X	X	X
Threespine stickleback	X	X	X					X
Trout-perch	X	X	X	X	X	X	X	X
Walleye			X				X	X
White bass	X	X	X	X	X	X	X	X
White perch	X	X	X	X	X	X	X	X
White sucker	X	X	X	X	X	X	X	X
Yellow perch	X	X	X	X	X	X	X	X

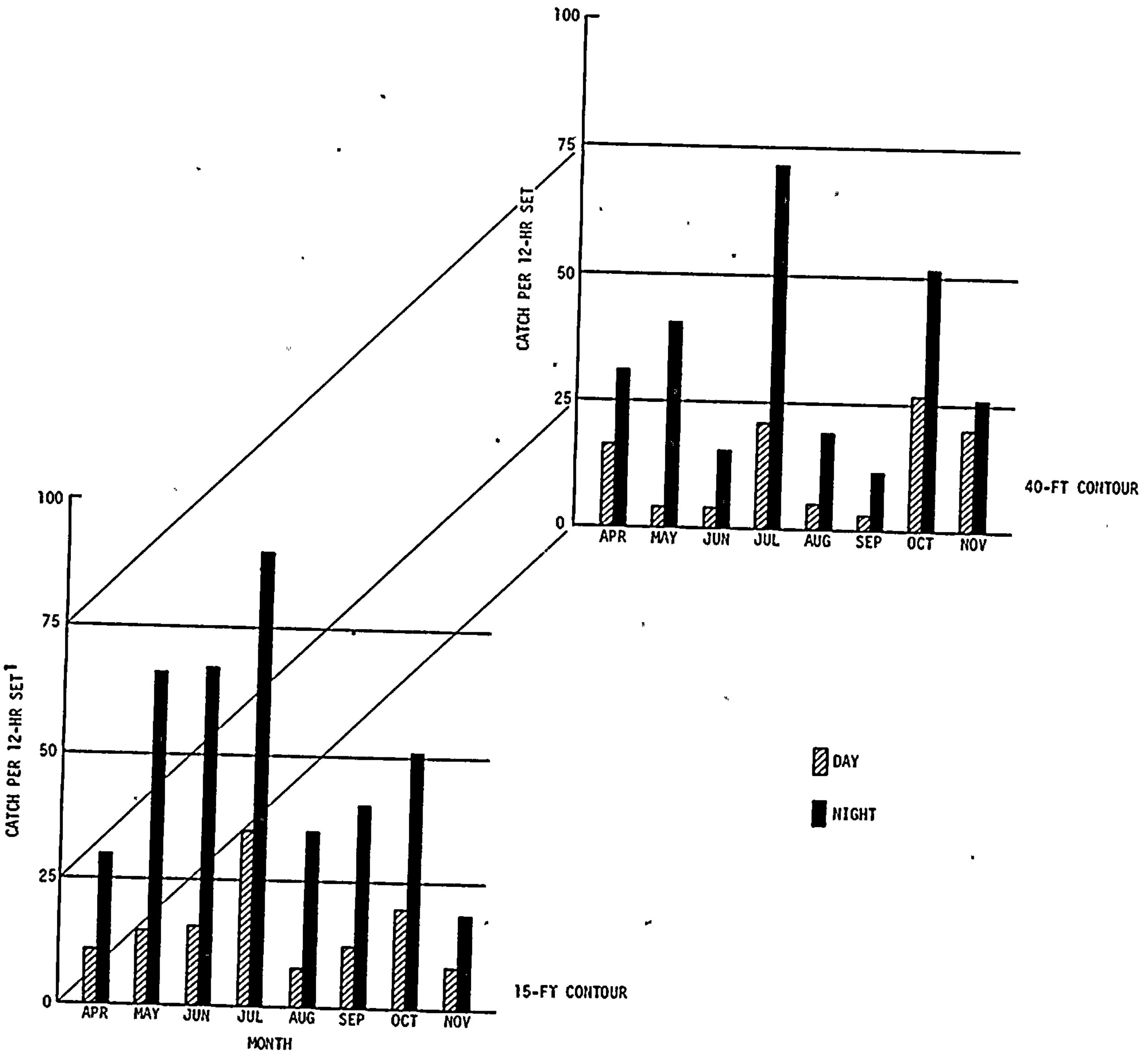
[1]Species identifications of lake trout and splake and mottled and slimy sculpins are tentative because of overlapping identifying characteristics in current fish identification keys and literature.

Figure IV-F 1. Monthly Occurrence of Fish Collected by All Gear, Nine Mile Point Vicinity, 1977



Unweighted monthly mean catch rates for samples collected at the 15, 30, 40, and 60 ft depth contours on four transects.

Figure IV-F 2. Temporal Abundance of Fish Collected by Gill Net, Nine Mile Point Vicinity, 1977



[1]Unweighted mean of all samples taken on contour during month.

Figure IV-F 3. Day and Night Catch Rates for Total Fish (all species combined) Collected by Gill Net, Nine Mile Point Vicinity, 1977

(catch per 12-hour set) for samples taken at stations on the 20-foot depth contour were excluded from discussion because catch rates from this contour were based on two samples of approximately 12-hour duration, rather than the four approximately 12-hour long samples taken at the other four depth contours. Catch data for the 20-foot contour and more detailed gill net data for all contours have been reported previously in the 1977 Data Report (Texas Instruments 1978). Catch rates at stations on the 15-foot depth contour (Figure IV-F 4) were usually lowest at control station NMPW (i.e., the westernmost station not subject to thermal influence from the discharges). Catches at control station NMPE (the easternmost station) were higher than catch rates at other stations during June through August and were relatively high during several other months. Abundance at the experimental stations NMPP and FITZ (the 15-foot stations nearest the discharges) were similar to each other although catch rates at NMPP were slightly but consistently higher than at FITZ.

At stations on the 30-foot depth contour, fish apparently were equally distributed among the four stations during April, August, and September (Figure IV-F 4). Catch rates, however, were higher in the eastern half of the study area (station NMPE and/or FITZ) during May through July and in October.

Spatial distribution on the 40-foot contour was similar to that described for the 30-foot contour except that catches were higher at FITZ and NMPE during April and were similar at all four stations during May, June, and November.

Catches at the four stations on the 60-foot depth contour were variable and showed no consistent trends.

b. Trawls

Trawl catches (catch per 15-minute tow) were highest during April, August, and September (Table IV-F 2). Alewife and rainbow smelt comprised the largest percentage of each monthly catch. Alewife dominated samples collected during April, May, August, and September and rainbow smelt dominated samples collected during June, July, October, and November (Appendix Tables F-8 and 9).

A comparison of day and night catch rates over the eight months sampled indicated that night trawl catches were significantly higher than day catches during five months and slightly higher than day catches in June (Appendix Table F-7).

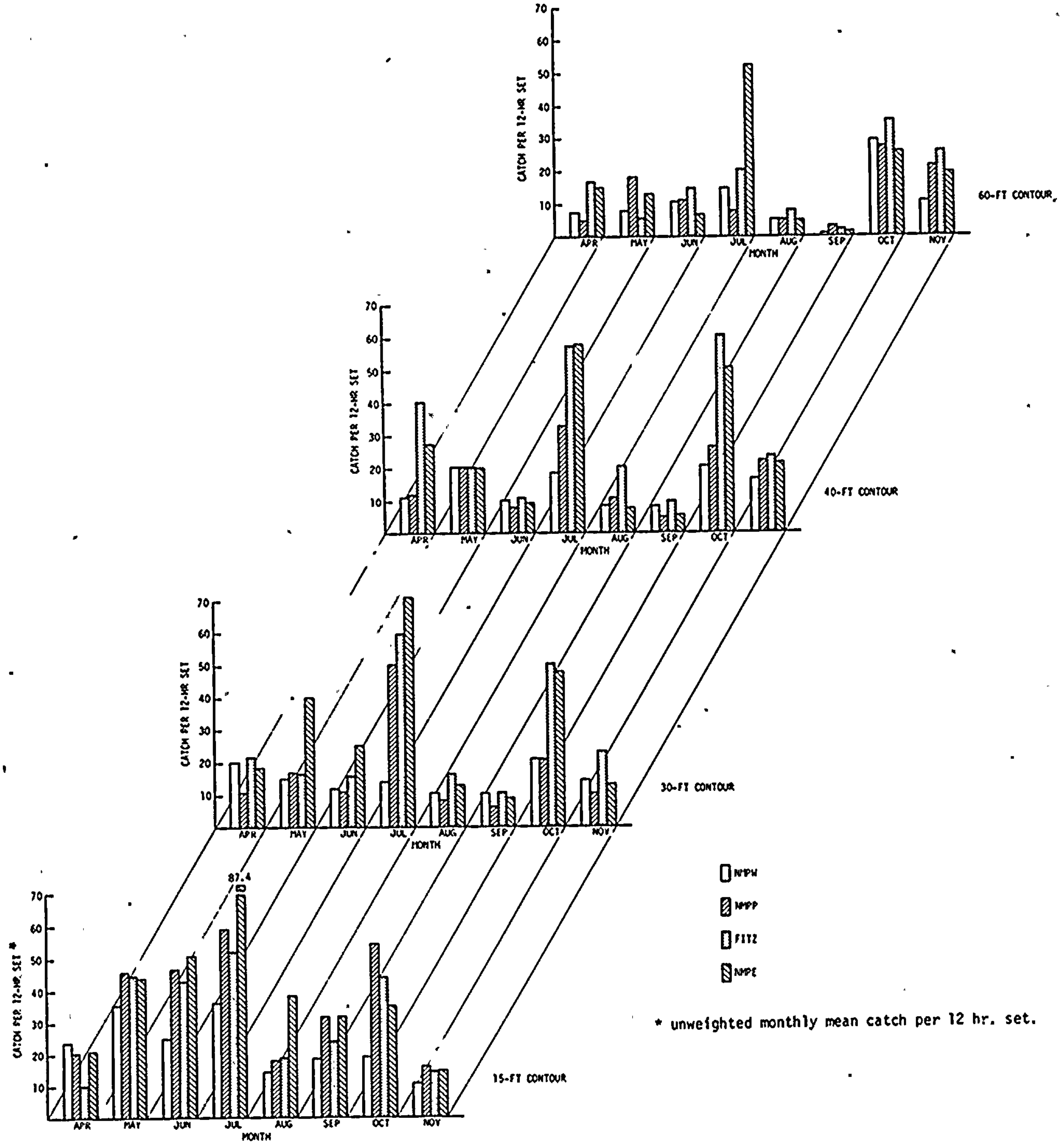


Figure IV-F 4. Spatial Distribution of Total Fish (all species combined) Collected by Gill Net, Nine Mile Point Vicinity, 1977

Table IV-F 2

Temporal Distribution of Fish Collected by Bottom Trawl, Nine Mile Point Vicinity, 1977

Species	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
					Month			
Alewife	118.1	16.1	0.6	0.7	90.7	202.6	0.3	2.3
Rainbow smelt	5.6	2.3	8.6	17.8	7.1	7.8	3.8	3.6
Other	1.1	1.0	1.0	0.4	0.1	3.0	0.2	0.6
Total Catch	124.8	19.4	10.2	18.9	97.9	213.4	4.3	6.5

* Mean monthly catch per 15-min tow; includes both otter trawl and Yankee trawl catches

The spatial distribution of fish along the 20-foot depth contour was apparently quite uniform during six of the eight months sampled (Appendix Table F-7). In August and September, however, catches were highest at the experimental station (NMPP/FITZ) and at NMPE.

Catch rates could not be compared for all stations on the 40- and 60-foot contours because stations on NMPE were sampled by a large Yankee trawl and the other stations (on NMPW and NMPP/FITZ) were sampled by a flat otter trawl. Catches with the Yankee trawl were usually higher than catches with the otter trawl but its use at the other locations was precluded by large rocks and boulders at these locations.

Catches at control station NMPW and experimental station NMPP/FITZ on the 40-foot contour were similar during six of the eight months sampled. During the other two months (August and September), catches were higher at the experimental station. Abundance during the year was variable at the control and experimental stations on the 60-foot contour. In April and October, catches at NMPW were similar to catches at NMPP/FITZ. However, catch rates were higher at the experimental station (NMPP/FITZ) in May and June and then higher at the control station (NMPW) during July through September and in November.

c. Beach Seine

Numbers of fish collected by beach seine increased from April through August and then declined through November (Table IV-F 3). Alewife or white perch usually dominated seine catches (Appendix Tables F-11 and 12) but spottail shiner accounted for over half the fish caught in June.

Table IV-F 3

Temporal Distribution of Fish in Beach Seine Collections,*
Nine Mile Point Vicinity, 1977

Species	Month							
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Alewife	0.3	2.4	0.9	32.2	67.2	78.4	0.2	0
Spottail shiner	0	0.2	8.2	0.7	0.7	0.8	0	0
White perch	0	0	0	0.8	167.4	11.2	20.9	0
Yellow perch	0	0.7	3.1	0.6	0.7	0.3	0.3	0
Other	1.6	0.4	1.0	4.4	45.0	5.7	13.5	0
Total Catch	1.9	3.7	13.2	38.7	281.0	96.4	34.9	0

* Mean number of fish collected each month.

Annual mean catch rates (number of fish per haul) were highest at experimental station NMPP (Appendix Table F-10). This station was located on a section of shoreline that was visibly different from the other three seining sites. The nearshore area at NMPP had a fairly large vegetated shallow that was generally protected from the surf. Annual mean catch was higher at the two control stations (NMPW and NMPE) than at FITZ, the other experimental station. At experimental stations NMPP and FITZ, fish were collected during 12 or 13 of the 16 sampling periods while at the control stations, fish were caught on 7 or 8 of the 16 sampling dates.

d. Box Trap

Box trap catches were highest in June and August (Appendix Table F-14). Rock bass, white perch, and yellow perch were the only species collected by trap (Table IV-F 1) and rock bass comprised the greatest percentage of the catch during each month of the study. Experimental station NMPP had the highest annual mean catch (4.8) but frequency of capture was similar at the control stations (NMPW and NMPE) and at NMPP.

3. Distribution, Size, and Reproduction of Selected Species

Alewife, rainbow smelt, smallmouth bass, white perch, and yellow perch were selected for detailed studies concerning several of their population characteristics. These species were chosen because of their classification as representative important species by Niagara Mohawk Power Corporation, the Nuclear Regulatory Commission, and the New York Department of Environmental Conservation. Temporal and spatial distribution, length frequency distributions, spawning season, and fecundity are discussed for each species. Additionally, age-class structure, coefficients of maturity, length-weight relationships, and stomach contents are discussed for smallmouth bass, white perch and yellow perch.

a. Alewife

1) Temporal and Spatial Distribution

Gill net catches (catch per 12-hour set) of alewife were highest in May and July and dropped sharply in late summer (Figure IV-F 2). No alewife were collected in September. Alewife usually were most abundant along the 15-foot contour. Annual mean catch rates were highest at station NMPE on each contour (15-, 30-, and 60-foot) except on the 40-foot contour, where annual catch rates were high at both FITZ and NMPE (Appendix Table F-2).

Alewife were collected by trawl during each month of the study (Table (V-F 2). Highest catch rates (catch per 15-minute tow) occurred in April, August, and September. Adult fish dominated April catches while young-of-the-year were abundant in the latter two months. Alewife abundance during these three months was higher along the 20- than 40- and 60-foot depth contours (Appendix Table F-8), based on those stations sampled with the flat otter trawl (see subsection F.2.c). Catches on the 20-foot contour varied and no trend in control versus experimental

areas was observed. Abundance at stations NMPW and NMPP/FITZ on the 40-foot contour was similar except in August and September when catches were highest at experimental station NMPP/FITZ. On the 60-foot contour, otter trawl catches were generally low except in May, September, and November. In May, catches were highest at NMPP/FITZ but in September and November, highest catches were at NMPW.

Alewife were most abundant in seine collections during July through September (Table IV-F 3 and Appendix Table F-11). Alewife abundance was highest at control station NMPW (67.1 fish per haul). Frequency of capture was similar at stations NMPW, FITZ and NMPE and was lowest at NMPP.

2) Length Frequency Distribution

Alewife collected by gill net ranged in length from about 80 to 230 millimeters and were primarily adult and subadult fish (Appendix Table F-15). Modal lengths of alewife collected during April and May were slightly higher than those collected throughout the remainder of the study. Adult and subadult alewife were collected by trawl during April through July and by beach seine from April through June (Appendix Tables F-20 and F-22). Young-of-the-year were first collected by seine in July and by trawl in August, and for the rest of the year alewife catches were comprised almost entirely of young-of-the-year fish.

3) Spawning and Fecundity

Adult alewife in Lake Ontario reside in the open lake and migrate inshore during spring and summer to spawn. Spawning occurs in streams or nearshore shallow water areas with sand and gravel bottoms, generally when water temperatures are between 16 and 28°C. Spawning females randomly broadcast from 10,000 to 22,400 (Scott and Crossman 1973; Norden 1967) demersal and essentially nonadhesive eggs (Mansueti 1956).

Alewife spawning in the Nine Mile Point vicinity was first detected on 27-28 June (when eggs were collected) and continued through July (Appendix Tables E-4 and E-5). Surface water temperatures at the 20-foot depth contour during this period ranged from approximately 13.9 to 26.0°C (Appendix Table G-3). Fecundity (total number of yolk eggs) of alewife selected for analysis ranged from

approximately 10,200 to 20,300 (Appendix Table F-28). Alewife fecundity was variable but usually incrased with increasing length of fish examined.

b. Rainbow Smelt

1) Temporal and Spatial Distribution

Rainbow smelt were collected by gill net during each month of the study. Catches were highest in early spring and were lowest during summer (Figure IV-F 2). Smelt abundance shifted from nearshore stations (15-foot contour) in early spring to offshore stations (30-, 40-, 60-foot contours) in June and July (Appendix Table F-3). During the early spring and late fall, catch rates along the offshore contours were generally higher at the FITZ or NMPE transects, but overall no distinct differences were observed between experimental and control areas.

Rainbow smelt were most abundant in trawl catches during July and were least abundant in May (Table IV-F 2). Catches of smelt in otter trawl samples were low but indicated that smelt were typically more numerous along the 60-foot depth contour. Based on annual mean catches smelt were most numerous at control station NMPW (Appendix Table F-9). Only one rainbow smelt was collected by beach seine, suggesting that smelt were not very abundant at the seining stations.

2) Length Frequency Distribution

Rainbow smelt collected by gill nets and trawls ranged from about 30 to 320 millimeters long (Appendix Tables F-16 and F-21). During the early spring a bimodal length frequency was apparent in trawl catches, with most fish being 51 to 80 millimeters or 131 to 170 millimeters. Adult and subadult smelt were collected by both gear during each month of the study. Young-of-the-year smelt were first collected in July by trawl and were the dominant life stage collected from August through November.

3) Spawning and Fecundity

Rainbow smelt leave the open water of lakes in spring to spawn in streams or shallow lakeshore waters over gravel shoals (Rupp 1965). Spawning migrations or runs of ripe smelt usually begin in March and continue through May when water temperatures range from 8.9 to 18.3°C (McKenzie 1964). The number of demersal (and adhesive) eggs spawned is dependent upon the size of the female but ranges from approximately 8,000 to 30,000 eggs (Scott and Crossman 1973).

Smelt spawning in the Nine Mile Point vicinity was documented by collecting eggs in benthic samples on 5 May, by collecting eggs in ichthyoplankton samples on 23 May, and by sporadic catches of prolarvae collected from 11 May to 28 June (Appendix Tables E-6, E-18, and E-19). Fecundity of smelt collected for analysis ranged between about 9,000 and 13,500 eggs for fish in the 156- to 170-millimeter length range (Appendix Table F-29).

c. White Perch

1) Temporal and Spatial Distribution

Based on gill net catches, white perch were most abundant in the Nine Mile Point area during July and October and least abundant during April (Figure IV-F 2). Highest catch rates for white perch coincided with the highest catch rates for total fish. White perch were most abundant along the shallowest (15-foot) depth contour sampled and catch rates usually decreased with increasing depth.

On the 15-foot contour, white perch catches were highest at one of the experimental stations (NMPP) and one of the control stations (NMPE), based on the mean catch rates for the sampling year (Appendix Table F-5). On the deeper contours, highest catches also occurred at one of the experimental stations (FITZ) and one of the control stations (NMPE), suggesting that there was no persistent pattern in fish distribution with respect to the experimental and control areas.

White perch were collected by seine from July through October with peak abundance in August (Table IV-F 3). Of the four seining locations, largest perch catches occurred at the NMPP station (Appendix Table F-12). As previously discussed, a small shallow bay with some aquatic vegetation existed at NMPP while the other stations were on more exposed beaches. Trawling provided no additional information on white perch distribution because only a few perch were caught with this gear. Tabulated spatial data on white perch and other selected species have been presented previously in the 1977 Data Report for the Nine Mile Point project (TI 1978).

2) Length Frequency Distribution

Adult and subadult white perch were collected by gill net during each month of the study (Appendix Table F-18). Young-of-the-year (≤140 millimeters)

perch were collected first during July by beach seine and were present in seine or gill net catches through November (Appendix Table F-23).

3) Age Class Distribution

White perch collected at control (NMPW and NMPE) and experimental (NMPP and FITZ) transects ranged in age from young-of-the-year to age class VII (Appendix Table F-33). No age I perch were collected. Based on the mean total length for each age class and the length frequency distribution for gill netted fish (Appendix Table F-18), most fish in the Nine Mile Point vicinity were in age classes III through V. Mean total length of fish from control and experimental transects were similar for ages 0 through V. Age VI perch collected at experimental transects, however, were longer (mean total length of 277.2 millimeters) than fish collected at control transects (mean total length of 215.3 millimeters).

4) Spawning and Fecindity

Lake Ontario white perch spawn in shallow water over a variety of substrates from mid-May through June (Sheri and Power 1968). Spawing usually takes place over a period of 1 to 2 weeks when water temperatures are 11.0 to 15.0°C. The number of demersal and adhesive eggs spawned is dependent upon the size of female but may range from 20,000 to 300,000 eggs (Scott and Crossman 1973).

Spawning activity in the vicinity of Nine Mile Point was not documented by the collection of white perch or Morone sp. (white perch or white bass) eggs. However, Morone sp. prolarvae were collected on 11 May and were present in Nine Mile Point samples through 29 July (Appendix Tables E-15 to 17) when surface water temperatures along the 20-foot contour ranged from approximately 8.5 to 26.0°C (Appendix Table G-3).

Coefficients of maturity, an indication of gonad development, declined from June through August reflecting the decrease in spawning activity during this period (Appendix Table F-26). Coefficients increased from August through October reflecting the development of the white perch gonads for spawning the following spring. Only a few adult white perch having gonads in varying developmental stages were collected in November resulting in variable coefficients of maturity during this month. Coefficients of maturity were similar

for white perch collected at experimental and control transects during each month.

Fecundity (total number of yolk eggs) was determined for fish covering a wide range of total lengths (Appendix Table F-31). Fecundity ranged from approximately 9,300 to 489,600 yolk eggs. The total number of yolk eggs for fish in the length ranges of 211 to 220 millimeters and 231 to 240 millimeters was highly variable. Mansueti (1961) noted that white perch spawned only a portion of the total number of eggs in their ovaries at any one time and suggested that unspawned eggs ripen progressively and may be released during two or three separate spawning acts. Use of gravid and partially spawned white perch for fecundity analysis would explain the variation observed in these data.

5) Length-Weight Relationships

Length-weight relationships were calculated for white perch males, females, and both sexes combined (male, female and undefined sex) collected by gill net at control (NMPW and NMPW) and experimental (NMPP and FITZ) transects (Table IV-F 4). Coefficients of determination (r^2), a measure of the linear association of length and weight, were high for length-weight relationships calculated for white perch collected during summer and fall. This indicated that a high degree of the variation in weight was due to variation in length. Low coefficients (r^2) in spring probably resulted from collecting fish in various stages of gonad development during the spawning season, because mature, gravid, ripe, and spent white perch of similar lengths vary considerably in weight. During the spring season, the slope (b) of the length-weight relationship for females from the experimental transects was steeper than the slope for females from control areas, indicating that experimental females were heavier at a given length than control females. Length-weight relationships for white perch males and combined sexes collected during spring had slopes that were lower than expected. These low slopes probably resulted from collecting fish in different stages of gonadal development or from collecting fish over a narrow range of lengths, such as an adult population during the spawning season. Length-weight relationships for each category (males, female, and both sexes combined) of white perch collected at experimental and control transects during summer and fall were similar.

Table IV-F 4

Length-Weight Relationships and Condition Factors (K_{TL}) for White Perch Collected by Gill Net at Control and Experimental Transects, Nine Mile Point Vicinity, 1977

Season	Sex	Control Transects (NMPE and NMPW) Length-Weight Relationship	No.	r^{2}*	$K_{TL} \pm$ S.D.**	Experimental Transects (NMPP and FITZ) Length-Weight Relationship	No.	r^2	$K_{TL} \pm$ S.D.
Spring (Apr-Jun)	Males	log w = -2.83 + 2.15 log TL	98	0.65	1.58 ± 0.85	log w = -2.11 + 1.86 log TL	45	0.55	2.01 ± 1.79
	Females	log w = -3.84 + 2.60 log TL	62	0.75	1.60 ± 0.24	log w = -5.38 + 3.25 log TL	54	0.96	1.67 ± 0.16
	Pooled#	log w = -4.73 + 2.97 log TL	325	0.85	1.65 ± 0.71	log w = -3.26 + 2.36 log TL	298	0.62	1.89 ± 1.40
Summer (Jul-Sep)	Males	log w = -4.62 + 2.93 log TL	131	0.89	1.67 ± 0.18	log w = -4.75 + 2.98 log TL	124	0.92	1.62 ± 0.18
	Females	log w = -4.73 + 2.99 log TL	138	0.66	1.75 ± 0.23	log w = -5.08 + 3.13 log TL	156	0.94	1.71 ± 0.14
	Pooled	log w = -5.28 + 3.22 log TL	732	0.95	1.67 ± 0.20	log w = -5.43 + 3.28 log TL	566	0.98	1.64 ± 0.32
Fall (Oct-Dec)	Males	log w = -5.61 + 3.37 log TL	31	0.98	1.76 ± 0.18	log w = -5.47 + 3.30 log TL	56	0.99	1.70 ± 0.18
	Females	log w = -5.74 + 3.42 log TL	26	0.97	1.82 ± 0.18	log w = -5.35 + 3.25 log TL	43	0.99	1.72 ± 0.16
	Pooled	log w - -5.53 + 3.33 log TL	735	0.97	1.38 ± 0.26	log w = -5.62 + 3.37 log TL	840	0.99	1.37 ± 0.24

* Coefficient of Determination

** Condition factor (based on total length in mm) ± standard deviation

\# Males, females, and undefined sex.

Condition factors, an indication of the relative plumpness or well-being of the fish, were calculated for the same fish used for length-weight relationships (Table IV-F 4). Condition factors for male and combined sexes collected during spring were variable, indicating that the individual condition factors for these fish varied widely or fish of similar lengths used in the calculations had different weights. Condition factors calculated for perch (male, female, and both sexes combined) collected at control and experimental transects were similar during each season.

6) Stomach Content Analysis

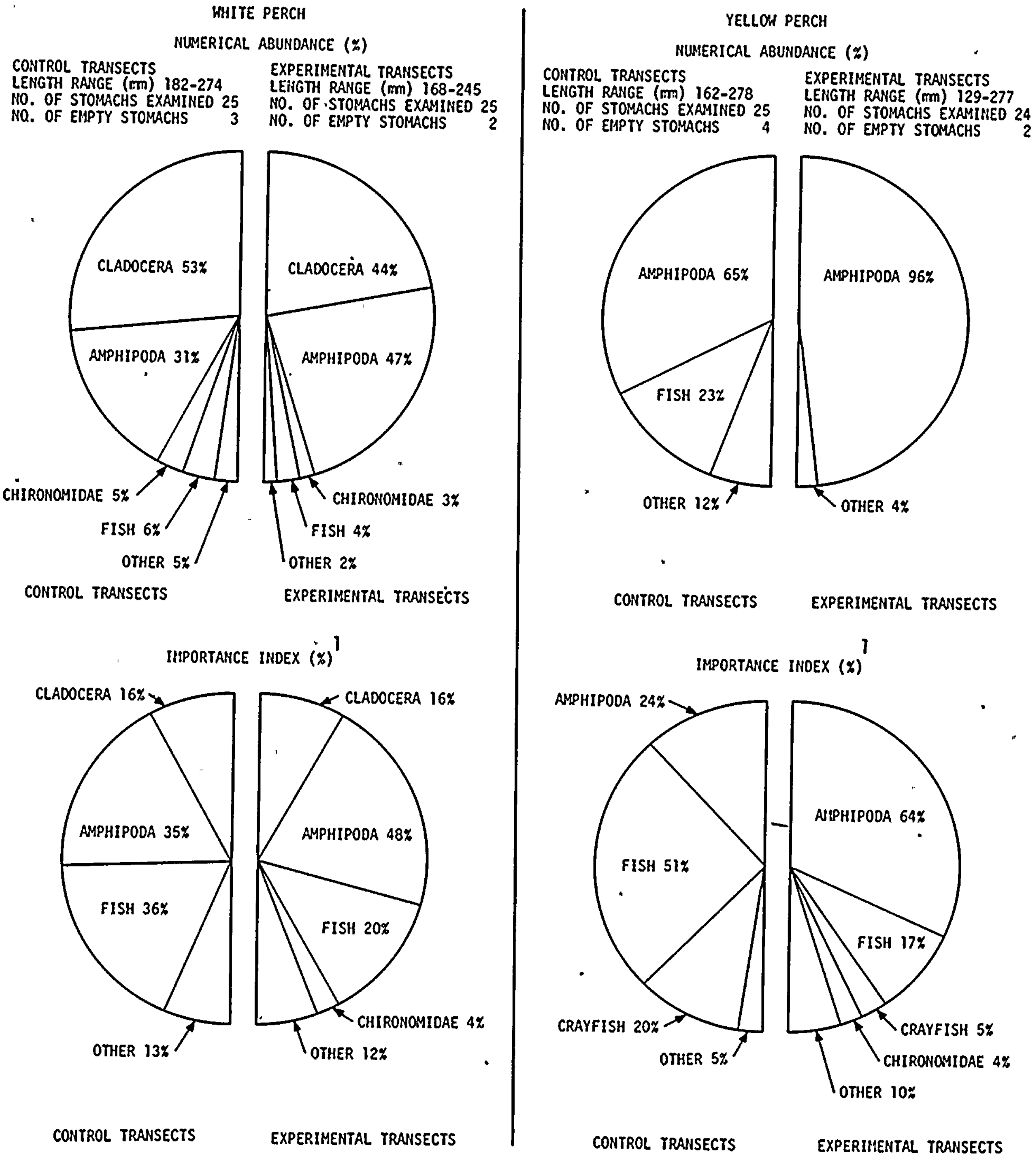
Stomach contents of adult white perch were examined to determine what food items were ingested by fish collected at control and experimental areas (Figure IV-F 5 and Appendix Table F-36). Numerically, Cladocera and Amphipoda comprised the highest percentage of the stomach contents of fish collected in each area. Dominant cladocera included Daphnia, Leptodora kindtii, and unidentified adults, while dominant Amphipods included Gammarus faciatus, Ponteporia affinis, and unidentifiable amphipods. Daphnia, Leptodora kindtii, and Gammarus faciatus were found in more than 40 percent of the stomachs examined from each area. Important indices (subsection III.A.6) calculated for food items found in stomachs of control and experimental transect fish were similar; the more important food items were cladocerans, amphipods, and fish.

d. Yellow Perch

1) Temporal and Spatial Distribution

Gill net catches of yellow perch were relatively small during the spring, while the largest catches occurred in July and October (Figure IV-F 2). Perch were more abundant along the nearshore depth contour (15 feet) than along the deeper contours (Appendix Table F-6). At the nearshore stations, catches tended to increase from west to east, but no spatial pattern was observed along the deeper contours. Only two yellow perch were caught by trawling.

Yellow perch were collected along the beaches by seine from May through October (Table IV-F 3 and Appendix Table F-13). Catch rates were highest during May, but this was the result of a single large catch at station



[1]See section III.A.6.b.5.

Figure IV-F 5. Stomach Content Analysis of Fish Collected by Gill Net at Control (NMPW and NMPE) and Experimental (NMPP and FITZ) Transects, Nine Mile Point Vicinity, 1977

NMPP. Catches of yellow perch and frequency of capture were highest at station NMPP.

2) Length Frequency Distribution

Adult yellow perch were collected by gill net during each month (Appendix Table F-19) and by beach seine from May through July (Appendix Table F-24). Young-of-the-year first appeared in beach seine catches during July and were collected through October. Young-of-the-year (≤120 millimeters) were first encountered in gill net samples during September and were collected by this gear through November.

3) Age Class Distribution

Ages of yellow perch collected at control and experimental transects ranged from ages I to VIII (Appendix Table F-34). Based on the mean total length at each age class and the length frequency distribution of gill netted fish (Appendix Table F-19), most yellow perch collected were ages II through V. Mean total lengths of ages III, IV and V perch collected at experimental and control transects were similar but age II fish collected at control transects were smaller than age II perch collected at experimental transects. Low numbers of fish in age classes VI to VIII precluded comparison of control and experimental fish in those age categories.

4) Spawning and Fecundity

Yellow perch migrate into the shallows of lakes to spawn during spring, usually from mid-April to early May, when water temperatures range from 8.9 to 12.2°C (Scott and Crossman 1973). Yellow perch eggs are extruded in long, gelantinous, accordian-folded strings that usually become entangled in the rooted vegetation or other substrates over which spawning occurs. Fecundity of Bay of Quinte, Lake Ontario, yellow perch ranged from approximately 3,000 to 61,000 eggs for fish 131 to 250 millimeters in fork length (Sheri and Power 1969).

Yellow perch prolarvae were collected in the Nine Mile Point area from 30 April to 14 June (Texas Instruments 1978) when surface water temperatures

along the 20-foot contour ranged from approximately 2.6 to 15°C (Appendix Table G-3). Highest concentrations of prolarvae were collected from 30 April to mid-May.

Coefficients of maturity were lowest from June through August, suggesting that most spawning activity had been completed in the area by this time. (Appendix Table F-27). Maturity values increased in September and were highest during October and November reflecting the development or maturation of the yellow perch gonads for spawning early the following spring. Coefficients of maturity were similar for perch collected at control and experimental transects.

5) Length-Weight Relationships

All length-weight relationships calculated for yellow perch had high coefficients of determination (r^2), indicating that a high degree of the variation in weight was due to variation in length (Table IV-F 5). All length-weight relationships indicated that yellow perch increase faster in weight (become plumper) than they increase in length. Length-weight relationships and condition factors calculated for control and experimental yellow perch were similar.

6) Stomach Content Analysis

Stomach contents of adult yellow perch were examined to determine the food items ingested by fish collected at control and experimental transects (Figure IV-F 5 and Appendix Table F-37). Numerically, amphipods (unidentifiable adult amphipods and <u>Gammarus faciatus</u>) and fish (<u>Cottus</u> sp.) were the dominant food items in stomachs of control fish and amphipoda was the dominant food item in the stomach of fish from the experimental area. These food items plus filamentous algae, crayfish (Astacidae), and midges (Chironomidae) frequently occured in stomachs of fish taken from both areas. Importance indices (see subsection III.A.6) ranked small fish as the most important food item in stomachs of fish from the control area and amphipods as the most important food item in stomachs of fish from the experimental area.

Table IV-F 5

Length-Weight Relationships and Condition Factors (K_{TL}) for Yellow Perch Collected at Control and Experimental Transects, Nine Mile Point Vicinity, 1977

Season	Sex	Control Transects (NMPE and NMPW) Length-weight Relationship	No.	r^{2*}	K_{TL} ± S.D.**	Experimental Transects (NMPP and FITZ) Length-weight Relationship	No.	r^2	K_{TL} ± S.D.
Spring (Apr-Jun)	Males	log w = -5.47 + 3.26 logTL	(21)	0.99	1.32 ± 0.14	log w = -5.70 + 3.35 logTL	(19)	0.98	1.29 ± 0.16
	Females	log w = -5.32 + 3.20 logTL	(40)	0.98	1.39 ± 0.16	log w = -5.57 + 3.30 logTL	(29)	0.98	1.41 ± 0.19
	Pooled #	log w = -5.03 + 3.07 logTL	(105)	0.97	1.36 ± 0.21	log w = -5.34 + 3.20 logTL	(103)	0.91	1.44 ± 0.62
Summer (Jul-Sep)	Males	log w = -5.61 + 3.34 logTL	(83)	0.97	1.43 ± 0.17	log w = -5.38 + 3.23 logTL	(81)	0.97	1.38 ± 0.16
	Females	log w = -5.29 + 3.20 logTL	(210)	0.97	1.51 ± 0.16	log w = -5.55 + 3.31 logTL	(182)	0.98	1.47 + 0.21
	Pooled	log w = -5.25 + 3.18 logTL	(384)	0.96	1.50 ± 0.22	log w = -5.29 + 3.20 logTL	(368)	0.95	1.46 ± 0.59
Fall (Oct-Dec)	Males	log w = -5.54 = 3.31 logTL	(41)	0.99	1.41 ± 0.16	log w - -5.52 + 3.29 logTL	(35)	0.99	1.38 ± 0.13
	Females	log w = -5.54 + 3.30 logTL	(52)	0.98	1.44 ± 0.14	log w = -5.57 + 3.31 logTL	(46)	0.98	1.40 ± 0.20
	Pooled	log w = -5.49 + 3.28 logTL	(187)	0.99	1.41 ± 0.15	log w = -5.25 + 3.17 logTL	(150)	0.93	1.44 ± 0.84

* Coefficient of Determination

** Condition factor (based on total length in mm) ± standard deviation

Males, females, and undefined sex

e. Smallmouth Bass

1) Temporal and Spatial Distribution

Smallmouth bass were collected by gill net during each month of the study (Appendix Table F-4). Although catches were low, smallmouth were most abundant during summer and least abundant during fall. Catch rates were highest along the inshore contour. Based on annual mean catch rates of the stations on the inshore contour (15-foot), smallmouth bass were most abundant at the two experimental stations (NMPP and FITZ). Catch rates at stations on the remaining contours were low. No smallmouth bass were collected by trawl, and only one was collected by beach seine.

2) Length Frequency Distribution

Smallmouth bass collected in gill nets ranged from about 150 to 430 millimeters long (Appendix Table F-17). During the summer months fish were distributed uniformly across the entire range of lengths, but during the spring larger bass predominated. All smallmouth bass collected by gill nets were yearlings or older.

3) Age Class Distribution

Ages of smallmouth bass collected at control and experimental transects ranged from age II to XI (Appendix Table F-32). The low numbers of fish in each age class precluded a comparison of fish from the control and experimental areas.

4) Spawning and Fecundity

Smallmouth bass spawn in late spring and early summer, usually from late May to early July. Smallmouth spawn in 2 to 20 feet of water on a sandy, gravel, or rocky substrate often near rocks, logs, and sometimes dense vegetation (Scott and Crossman 1973). Nest building takes place over a wide range of temperatures (12.8-20.0°C) but actual spawning most often occurs when temperatures range between 16.1 and 18.3°C. The number of eggs spawned (fecundity) varies with the size of the female but ranges from 5,000 to 14,000 eggs.

No smallmouth bass eggs or larvae were collected in the Nine Mile Point vicinity ichthyoplankton samples (subsection IV.E). Since few smallmouth bass were collected during 1977, data on coefficients of maturity were limited (Appendix Table F-25). Likewise, few gravid smallmouth females were collected but fecundity ranged from about 2,800 to 20,400 eggs (Appendix Table F-30). Smallmouth bass selected for fecundity analyses from impingement samples at James A. FitzPatrick contained from 5,387 to 26,385 eggs (Appendix Table H-25).

5) Length-Weight Relationships

Length-weight relationships were calculated for males, females, and both sexes combined (Table IV-F. 6). The linear relationship between lengths and weights of bass was high for fish collected during summer, indicating that the variation in weight was due to the variation in length. Length-weight relationships for Summer fish indicated that bass increase in weight faster (become plumper) than they increase in length. Length-weight relationships for bass collected at the experimental and control areas during summer were similar.

6) Stomach Content Analysis

Stomach contents of adult smallmouth bass were examined to determine what food items were injested by bass collected at control and experimental transects (Appendix Table F-35). Crayfish (Astacidae), fish, and aquatic insects were the only food items found in the smallmouth bass stomachs examined, and no differences between control and experimental areas could be detected.

Table IV-F 6

Length-Weight Relationships and Condition Factors (K_{TL}) for Smallmouth Bass Collected at Control and Experimental Transects, Nine Mile Point Vicinity, 1977

Season	Sex	Control Transects (NMPE and NMPW)				Experimental Transects (NMPP and FITZ)			
		Length-weight Relationship	No.	r^2*	$K_{TL} \pm$ S.D.**	Length-weight Relationship	No.	r^2	$K_{TL} \pm$ S.D.
Spring	Males	NC			NC	NC			NC
(Apr-Jun)	Females	NC			NC	log w = -1.49 + 1.67 log TL	(5)	0.60	2.34 ± 1.69
	Pooled#	NC			NC	log w = -2.57 + 2.13 logTL	(11)	0.82	1.77 ± 1.22
Summer	Males	log w = -5.89 + 3.43 logTL	(13)	0.98	1.57 ± 0.30	log w = -5.01 + 3.09 logTL	(23)	0.98	1.65 ± 0.18
(Jul-Sep)	Females	log w = -5.17 + 3.16 logTL	(22)	0.96	1.67 ± 0.17	log w = -5.31 + 3.21 logTL	(28)	0.97	1.70 + 0.23
	Pooled	log w = -5.41 + 3.25 logTL	(39)	0.97	1.63 ± 0.22	log w = -5.17 + 3.16 logTL	(69)	0.97	1.67 ± 0.20
Fall	Males	log w = -5.54 + 3.31 logTL	(4)	0.94	1.66 ± 0.20	NC			
(Oct-Dec)	Females	NC				NC			NC
	Pooled	NC				NC			NC

* Coefficient of Determination

** Condition factor (based on total length in mm) ± standard deviation

\# Males, females, and undefined sex

NC = Relationship was not calculated because low catches

G. WATER QUALITY

During 1977, water samples from Lake Ontario were collected to monitor water quality and temperature in the vicinity of Nine Mile Point and to evaluate potential effects of the operation of Nine Mile Point and James A. FitzPatrick generating plants on nearshore water quality.

1. Lake Ontario Thermal Profiles

Thermal profiles were obtained at the 100-foot contour of the NMPW, FITZ, and NMPE transects each week during the study (Appendix Table G-1). Examination of these profiles and of the temperature of surface (3-foot) and bottom (100-foot) strata at these three transects revealed the presence of cold, hypolimnetic water intrusions during the summer (Figure IV-G 1). Comparisons of weekly temperature profiles among the three transects revealed that surface water temperatures at the FITZ transect (nearest the discharges) exceeded those at either or both the NMPW and NMPE transects by 1°C or more on only four occasions (once each in June and May and twice in July).

Surface temperatures taken during collection of monthly and twice monthly water quality samples revealed elevated temperatures (maximum 1.3°C) at the 20-foot contour of the FITZ transect (near the James A. FitzPatrick discharge) on two sampling days and at the 40-foot contour (maximum 2°C) on three days (see Appendix Tables G-2 and G-3). At the NMPP transect near the Nine Mile Point discharge, surface temperatures exceeded by at least 1°C those of one or both control transects, NMPW and NMPE, on 12 of 17 and 8 of 17 sampling dates at the 20-foot and 60-foot contours respectively. Maximum thermal difference between experimental and control transects occurred August 30 when the NMPP 20-foot contour surface temperature was 6°C higher than that recorded at the NMPE transect (Appendix Tables G-2 and G-3). The thermal plume at the NMPP transect is more pronounced, probably due to the difference between the Nine Mile Point and James A. FitzPatrick discharge structures (jet diffusion at J.A. FitzPatrick).

2. Temporal and Spatial Distribution of Selected Parameters, Including Radiological Data

Three water quality sampling programs were conducted during the 1977 study. Refer to subsection III.A.7 for a complete description of the sampling programs. In order to describe spatial and temporal trends in the water quality

data, all 20- and 25-foot contour surface data were combined and compared to combined surface data from the 40-, 45-, and 60-foot contours for each transect. Bottom samples at the 25- and 45-foot contours were evaluated individually as no bottom samples were collected at the other contours. These groupings were made in order to compare inshore versus offshore areas in the Nine Mile Point vicinity.

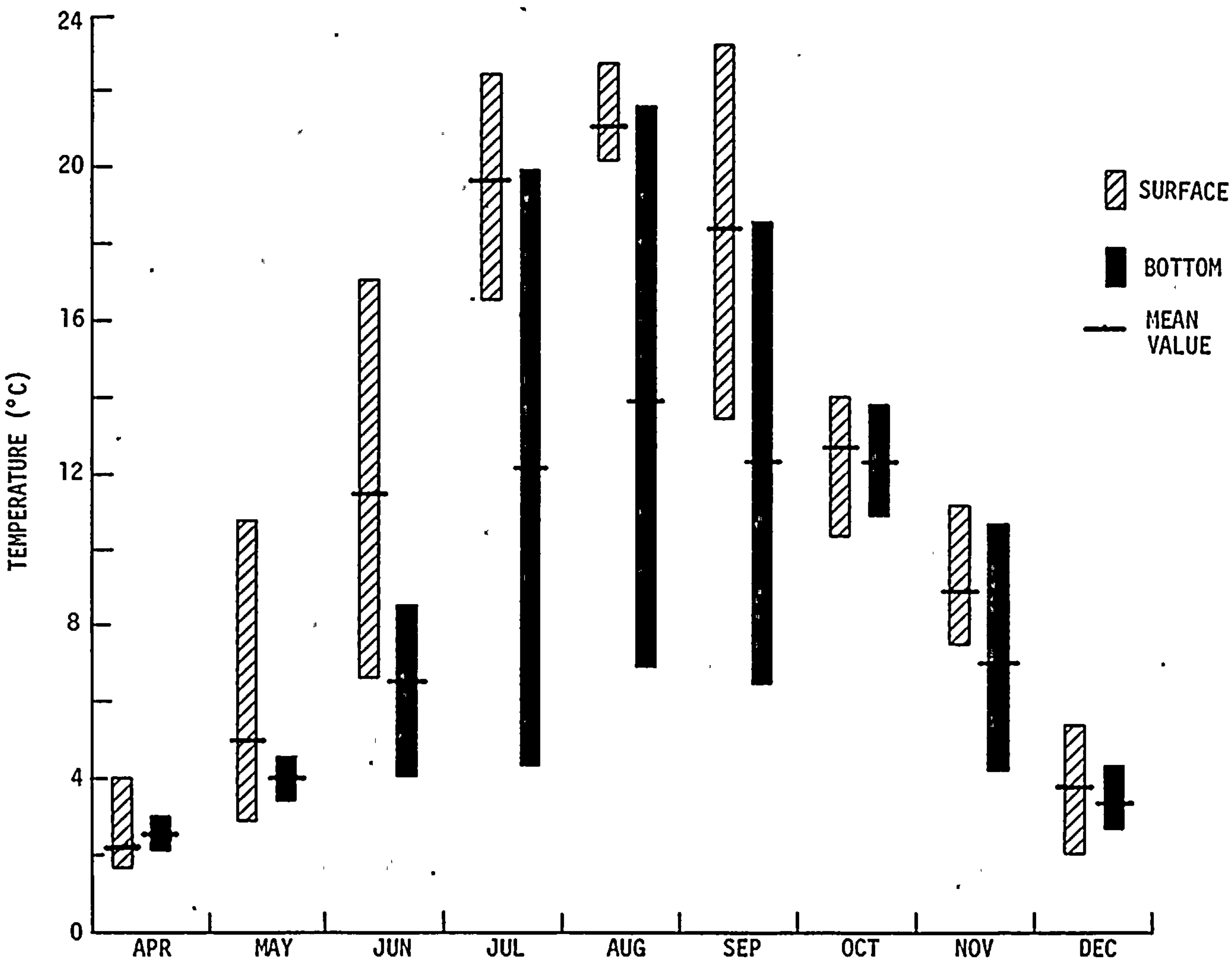


Figure IV-G 1. Seasonal Variation in Water Temperatures (monthly means and range of weekly values for the NMPW, NMFP and NMPE transects) at Surface (3 foot) and Bottom (100 foot) Strata along the 100-Foot Depth Contour

Seven of the water quality parameters measured in the vicinity of Nine Mile Point during 1977 are discussed in detail: dissolved oxygen (DO), nitrate nitrogen, phosphorus, silica, calcium, sulfate, and total and suspended solids. These parameters were selected because of their roles in the biological processes in the waters around Nine Mile Point or their importance in general water quality evaluations. In addition, toxic and trace metals and organic contaminants are briefly discussed.

a. Dissolved Oxygen

Dissolved oxygen concentrations were high in spring, fall, and winter and only slightly lower during summer (Table IV-G 1). These temporal differences were probably due to turbulence from wind and wave activity. The lowest dissolved oxygen value (6.9 milligrams per liter) was observed at the NMPW transect during May, but this concentration is more than adequate to sustain all aquatic life in the area. No differences between inshore (20- and 25-foot contours) and offshore (40-, 45-, and 60-foot contours) or between control and experimental areas were observed (Table IV-G 2).

b. Nitrate

Nitrate concentrations at all transects decreased from April through August followed by increases from September through December (Table IV-G 1). Highest monthly mean values were found in December. Inshore areas (20- and 25-foot contours) and bottom samples had slightly higher nitrate values, but no differences were found among transects (Table IV-G 2 and Appendix Table G-4).

c. Phosphorus

Lowest orthophosphorus levels were found during May, June, and July (Table IV-G 1). Monthly changes in orthophosphorus were related to phytoplankton activity; the lower orthophosphorus levels were associated with increased phytoplankton density (see Phytoplankton subsection IV.A). Lowest total phosphorus was found during July and August but very little annual variation was observed (Table IV-G 1). No spatial differences were found for total or orthophosphorus, either among transects, between inshore and offshore groups, or with depth (Table IV-G 2 and Appendix Table G-4).

Table IV-G 1

Monthly Variation in Selected Water Quality Parameters Collected in the Vicinity of Nine Mile Point, 1977

Parameter		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Dissolved oxygen (mg/ℓ-D.O.)	Mean	13.6	12.4	11.2	10.4	9.8	10.0	10.2	10.8	12.5
	Range	12.0-15.4	6.9-14.4	10.7-11.8	8.9-11.6	9.0-10.4	9.0-11.3	9.7-10.9	10.1-11.4	12.0-13.1
	St.D.*	1.6	2.2	0.4	0.9	0.5	0.7	0.3	0.4	0.4
	No.	18	18	17	18	12	18	18	18	12
Nitrate (mg/ℓ-N)	Mean	0.27	0.28	0.19	0.09	0.04	0.16	0.21	0.22	0.30
	Range	0.18-0.32	0.18-0.53	0.11-0.29	<0.04-0.19	<0.02-0.07	0.03-0.43	0.19-0.23	0.13-0.31	0.29-0.32
	St.D.	0.05	0.12	0.08	0.06	0.02	0.12	0.02	0.09	0.01
	No.	16	16	16	16	16	16	16	16	10
Total phosphorus (mg/ℓ-P)	Mean	0.021	0.023	0.026	0.019	0.017	0.029	0.022	0.018	0.018
	Range	0.010-0.055	0.011-0.034	0.020-0.037	0.007-0.047	0.003-0.047	0.014-0.068	0.014-0.061	0.008-0.032	0.012-0.029
	St.D.	0.010	0.006	0.004	0.010	0.011	0.014	0.011	0.008	0.005
	No.	22	22	22	22	22	22	22	22	16
Orthophosphorus (mg/ℓ-P)	Mean	0.009	0.004	0.004	B.D.**	0.005	0.007	0.005	0.008	0.009
	Range	0.005-0.012	<0.002-0.008	<0.002-0.010		<0.002-0.010	0.002-0.031	0.003-0.013	<0.002-0.011	0.006-0.012
	St.D.	0.002	0.002	0.002		0.003	0.008	0.003	0.004	0.002
	No.	16	16	16		16	16	16	16	10
Silica (mg/ℓ-SiO$_3$)	Mean	0.43	0.66	0.07	0.16	0.19	0.45	0.41	0.38	0.33
	Range	0.34-0.65	<0.05-1.32	<0.05-0.17	0.08-0.34	0.11-0.56	0.09-1.73	0.33-0.67	0.20-0.60	0.25-0.39
	St.D.	0.12	1.24	0.03	0.06	0.12	0.46	0.09	0.16	0.05
	No.	16	16	16	16	16	16	16	16	10
Calcium (mg/ℓ-Ca)	Mean	45.4	47.7	38.7	48.6	43.2	46.2	36.5	34.2	36.6
	Range	39.6-49.4	44.5-51.5	27.5-52.2	41.3-59.2	37.4-47.7	42.0-52.7	32.1-42.1	26.9-45.1	30.2-44.7
	St.D.	2.7	2.5	7.5	6.7	2.9	4.6	3.1	8.6	6.9
	No.	10	10	10	10	10	10	10	10	10
Sulfate (mg/ℓ-SO$_4$)	Mean	29.0	30.8	31.3	37.0	33.8	27.4	22.9	30.3	27.1
	Range	27.7-30.8	28.0-39.3	27.2-37.0	33.9-42.6	30.8-36.4	26.7-28.7	20.8-25.4	20.7-36.9	26.2-27.8
	St.D.	1.1	3.6	3.3	3.1	2.0	0.7	1.8	8.2	0.5
	No.	10	10	10	10	10	10	10	10	10
Total solids (mg/ℓ - TS)	Mean	271	322	272	231	260	224	218	191	196
	Range	144-636	167-670	141-410	179-339	210-365	138-288	160-261	131-249	170-221
	St.D.	100	115	92	40	44	31	28	35	16
	No.	22	22	22	22	22	22	22	22	16
Total suspended solids (mg/ℓ-TSS)	Mean	2.4	0.6	0.7	1.1	1.8	1.9	2.1	2.1	3.4
	Range	0.2-5.2	<0.1-2.0	<0.1-2.6	0.1-2.1	<0.1-6.0	0.8-7.0	0.2-11.4	0.6-4.0	1.8-5.2
	St.D.	2.1	0.5	0.7	1.0	1.5	1.9	2.5	1.4	0.8
	No.	22	22	22	21	22	22	22	22	16

*Standard deviation.

**B.D. – >50% of the values calculated were below detectability.

Table IV-G 2

Spatial Distribution of Selected Water Quality Parameters Collected from Experimental and Control Areas, Nine Mile Point Vicinity, 1977

Parameter		Surface - 20- and 25-Ft Contours			Surface — 40-, 45-, and 60-Ft Contours		
		West Control (NMPW)	Experimental (NMPP-FITZ)*	East Control (NMPE)	West Control (NMPW)	Experimental (NMPP-FITZ)*	East Control (NMPE)
Dissolved oxygen (mg/ℓ-D.O.)	Mean	10.9	11.1	11.5	11.1	11.1	11.4
	Range	6.9-15.4	8.9-15.4	9.1-15.4	8.9-15.4	8.9-15.4	9.3-15.4
	St.D.**	2.02	1.62	1.60	1.58	1.52	1.64
	No.	25	24	25	25	25	25
Nitrate (mg/ℓ-N)	Mean	0.21	0.20	0.18	0.18	0.19	0.17
	Range	0.03-0.53	0.03-0.53	<0.02-0.40	0.02-0.36	0.02-0.32	0.03-0.29
	St.D.	0.14	0.12	0.11	0.10	0.10	0.09
	No.	17	26	17	17	26	17
Total phosphorus (mg/ℓ-P)	Mean	0.025	0.023	0.021	0.021	0.021	0.020
	Range	0.008-0.061	0.007-0.061	0.010-0.036	0.011-0.043	0.003-0.047	0.008-0.032
	St.D.	0.016	0.012	0.007	0.007	0.008	0.007
	No.	26	35	26	26	35	26
Orthophosphorus (mg/ℓ-P)	Mean	0.007	0.007	0.005	0.005	0.005	0.006
	Range	<0.002-0.031	<0.002-0.024	<0.002-0.010	<0.002-0.010	<0.002-0.012	<0.002-0.013
	St.D.	0.007	0.005	0.003	0.003	0.004	0.004
	No.	17	26	17	17	26	17
Silica (mg/ℓ SiO_2)	Mean	0.40	0.34	0.29	0.29	0.27	0.25
	Range	<0.05-1.73	<0.05-1.34	<0.05-0.77	<0.05-0.70	<0.05-0.65	<0.05-0.52
	St.D.	0.46	0.33	0.22	0.21	0.18	0.15
	No.	17	26	17	17	26	17
Calcium (mg/ℓ-Ca)	Mean	42.2	41.8	39.7	43.0	42.0	40.5
	Range	28.2-59.2	26.9-50.1	27.5-46.3	28.2-58.0	27.5-52.8	27.3-51.5
	St.D.	10.41	6.38	7.92	9.35	6.81	8.30
	No.	9	18	9	9	18	9
Sulfate (mg/ℓ-SO_4)	Mean	31.5	29.6	30.8	32.5	29.5	30.1
	Range	25.0-42.6	20.7-36.9	22.9-36.9	27.0-42.5	20.7-36.9	27.0-36.9
	St.D.	5.86	4.77	4.81	6.27	4.70	4.91
	No.	9	18	9	9	18	9
Total solids (mg/ℓ-TS)	Mean	296	245	254	240	232	223
	Range	197-670	171-421	177-403	157-488	116-392	131-367
	St.D.	124	56	67	78	68	53
	No.	26	35	26	26	35	26
Total suspended solids (mg/ℓ-TSS)	Mean	1.7	2.1	1.6	1.8	1.8	1.3
	Range	<0.1-4.0	<0.1-11.4	<0.1-6.4	<0.1-5.6	<0.1-9.4	<0.1-5.2
	St.D.	1.1	2.4	1.6	1.4	1.8	1.4
	No.	26	35	26	26	35	26

*See subsection III-A 7 for details of sampling locations.

**Standard deviation.

d. Silica

Lowest values were observed during May, June, and July and were at or near the detectability limit of 0.05 milligrams per liter (Table IV-G 1). Inshore surface samples had slightly higher levels of silica when compared to offshore samples, and silica decreased slightly from western to eastern transects (Table IV-G 2). Bottom samples, however, revealed offshore increases in annual mean values. None of the changes in silica levels could be attributed to power plant operation.

e. Calcium and Sulfate

Monthly variations in both calcium and sulfate concentrations were very small. Lowest mean calcium and sulfate concentrations were observed in November and October, 34.2 and 22.9 milligrams per liter respectively (Table IV-G 1). Sample variability, although slight, masked any annual spatial trends that might exist among transects (control versus experimental), between inshore and offshore areas, and between depths (Table IV-G 2).

f. Solids

Total solids decreased during fall and winter while suspended solids increased (Table IV-G 1). The lower water temperatures during fall and winter resulted in a decreased dissolution rate of some solids (creating lower dissolved solids and therefore lower total solids). High winds and wave action resuspended bottom sediments, and this plus shoreline and Oswego River runoff caused higher suspended solids. The increase in suspended solids was not high enough to cause an increase in total solids, resulting in the seemingly incongruous situation of total solids decreasing while total suspended solids increased. Total solids, considering both surface and bottom samples, were highest at inshore locations and at the west transect (nearest the Oswego River). Surface samples were higher in total solids (mean = 248 milligrams per liter) than bottom samples (mean = 213 milligrams per liter); in surface samples, total solids were highest along the inshore contours at the experimental transects. In bottom samples, suspended solids were greatest at the offshore contour.

g. Metals (Common, Trace, and Toxic)

Seasonal variability was limited with respect to the commonly occurring metals. Sodium showed a slight increase during winter although concentrations of nickel, manganese, and magnesium varied little throughout the year.

Of the trace metals, beryllium and vanadium levels were at or below the detectability limit during the entire year. Selenium was detectable only during August, September, and December. No inshore-offshore or surface-bottom differences were found for any of these metals.

Cadmium, chromium, mercury, and silver concentrations never exceeded the detection limits for these elements. Copper, lead, zinc, and arsenic were commonly encountered at levels above those of minimum detection but never at levels harmful to organisms found in the area or in excess of EPA standards (USEPA 1976b). No spatial trends could be determined among transects, since metal analyses were conducted only on samples from the NMPP/FITZ transect (Appendix Table G-4).

h. Indicators of Organic Pollution

No temporal or spatial trends among transects were apparent for biological oxygen demand (BOD_5), chemical oxygen demand (COD), total coliform bacteria, or carbon chloroform extract (CCE). Total coliform bacteria and COD were higher in surface than bottom samples. No pollution problem was indicated from either coliform or COD analyses, as no monthly value exceeded either state or federal regulations. No effects of plant operations on these parameters were observed.

i. Radioactivity

Gross alpha and gamma spectroscopy were below detection limits for all but some very low gross alpha values in June and August. Gross beta and tritium were found in low concentrations which did not exceed ambient Lake Ontario levels. No differences were determined between experimental and control areas.

SECTION V

RESULTS AND DISCUSSION — IN-PLANT STUDIES

A. INTRODUCTION

When a natural water body such as Lake Ontario is used for cooling an electric power station, debris, fish, larger invertebrates, and small planktonic organisms are drawn into the cooling water system. Debris, fish, and large invertebrates are impinged on the bar racks and traveling screens and consequently removed from the cooling water. The small planktonic organisms, on the other hand, pass through the screens and subsequently through the entire cooling water system to be discharged back into the lake.

Both the Nine Mile Point and James A. FitzPatrick power stations have once-through cooling systems with offshore submerged intakes and discharges (see Section II). At maximum operation the Nine Mile Point station requires 597 cubic feet per second (cfs) of cooling water while the James A. FitzPatrick station requires 825 cfs. The results presented in this section of the report document the entrainment and impingement at both power stations during 1977, satisfying the NRC and NPDES permit requirements to monitor the plants for potential effects on the aquatic biota.

Water from Lake Ontario enters the cooling water systems at the Nine Mile Point and James A. FitzPatrick stations through separate submerged intake structures located directly offshore of each plant near the 25-foot depth contour. Water velocity at the intake ports at Nine Mile Point is approximately 1.8 feet per second (fps) with all circulating pumps running; at FitzPatrick, intake velocity is about 1.2 fps. Fish entering the cooling water systems are impinged on traveling screens and subsequently backwashed from the screens into washwater sluiceways where the impingement collection baskets are located. There are no facilities at either station to return impinged fish to the lake so they are consequently removed from the Lake Ontario ecosystem.

Specific studies of fish impingement at Nine Mile Point Unit 1 began in the spring of 1972 while impingement studies at FitzPatrick were initiated when the plant started operating in 1975. The impingement of fish on the traveling screens at these two plants has been monitored so that the total loss of

fish, in terms of numbers and weights, could be estimated each year. In addition to estimating annual impingement, the principal objectives of the 1977 impingement program were to:

- Determine the species composition of the impinged fish
- Describe the seasonal patterns of impingement rates
- Characterize daily variations in impingement rates

Phytoplankton, zooplankton, and fish eggs and larvae in the cooling water pass through the traveling screens and subsequently through the circulating pumps, condenser tubes, and discharge structures. The stresses these organisms are exposed to include temperature changes, mechanical abrasion, shear forces, pressure changes, and exposure to biocides which act independently or synergistically to affect the entrained organisms. Although entrainment kills some of the aquatic biota in the cooling water, it may also produce subtle nonlethal short-or long-term effects, be beneficial, or in some cases, produce no identifiable response. Phytoplankton as a group can survive higher temperatures than zooplankton and ichthyoplankton (Marcy 1975) and are less vulnerable to mechanical damage because of their smaller size. Not only are phytoplankton more tolerant to entrainment effects, but they also have the greatest capacity to regenerate losses following entrainment (Morgan and Stross 1969). Zooplankton also have relatively short regeneration times and can replace entrainment losses quickly (Churchill and Wojtalik 1969, Heinle 1969).

Entrainment studies at the Nine Mile Point and James A. FitzPatrick stations were initiated about the same time as the impingement studies and comprehensive results of this earlier work was presented in the 1973 Nine Mile Point Report (QLM 1974) and the 1976 Annual Report for Nine Mile Point (LMS 1977a). The 1977 entrainment program at Nine Mile Point was conducted to document the species compositiion and seasonal variation in entrainment of ichthyoplankton. Previous studies at Nine Mile Point concerning entrainment of phytoplankton and microzooplankton (QLM 1974 and LMS 1975a) have established no significant impact on these two biotic groups so only ichthyoplankton was addressed during the 1977 study (see Section II.B for methods). At the James A. FitzPatrick station, the 1977 program included both entrainment and viability (mortality) studies on phyto-

plankton, zooplankton, and ichthyoplankton. The major objectives were to:

- Determine entrainment rates for the zooplankton and ichthyoplankton communities at the FitzPatrick plant
- Describe the potential effect of entrainment on the phytoplankton community by monitoring chlorophyll a levels and primary production (^{14}C method) at several locations in the plant and lake
- Estimate the percent mortality due to entrainment in the zooplankton and ichthyoplankton components of the aquatic biota.

Since plant operations have a direct impact on the effects of impingement and entrainment (i.e., changing intake velocities and discharge temperatures), certain parameters describing plant operation for each day of 1977 are presented in Appendix Tables H-1 and H-2.

B. IMPINGEMENT

1. Nine Mile Point Nuclear Station

a. Species Composition

Impingement sampling at Nine Mile Point during 1977 resulted in the collection of 51 fish taxa, 46 of which were identified to species (Table V-B 1).

Table V-B 1

Number and Weight of Fish Collected during Impingement Sampling, and Estimated Annual Impingement, Nine Mile Point Unit 1, 1977

Common Name*	Number Collected	Weight (g)** Collected	Estimated Number	Estimated** Weight (g)
Alewife	28,213	370,343.5	65,187	871,765.2
American eel	161	55,127.5	376	130,000.2
Black crappie	9	50.6	22	118.9
Bluegill	33	60.6	77	141.0
Bluntnose minnow	26	44.6	60	104.0
Bowfin	1	105.7	2	252.1
Brook stickleback	112	98.3	258	229.8
Brown bullhead	40	3,447.6	95	8,190.0
Brown trout	7	12,753.5	16	30,315.4
Burbot	39	36,662.5	91	85,472.1
Carp	2	3,716.4	4	8,576.3
Central mudminnow	33	169.3	77	389.4
Channel catfish	2	34.1	5	81.3
Cisco	1	10.3	2	23.8
Coho salmon	1	643.5	2	1,534.5
Creek chub	2	37.3	5	88.9
Cyprinidae	1	12.0	2	28.6
Emerald shiner	314	1,737.8	747	4,128.1
Freshwater drum	2	894.2	4	2,132.3
Gizzard shad	3,124	291,773.4	7,362	691,661.8
Golden shiner	4	25.9	9	61.3
Goldfish	5	1,532.8	11	3,578.7
Johnny darter	629	1,022.0	1,427	2,342.1
Lake chub	45	1,192.4	106	2,821.1
Lake trout[1]	10	1,522.2	23	3,627.5
Largemouth bass	2	768.9	4	1,774.4
Logperch	1	5.7	2	13.2
Longnose dace	3	24.5	7	57.7
Mottled sculpin[1]	1,217	4,190.9	2,861	9,873.0
Northern hogsucker	1	NA	2	NA
Northern pike	3	2,699.0	7	6,436.1
Pumpkinseed	29	799.2	69	1,902.8
Rainbow smelt	15,614	68,827.8	36,653	162,507.1
Rainbow trout	2	1,520.2	4	3,590.2
Rock bass	411	88,430.9	971	209,547.0
Salmon (unidentified)	1	8.6	2	20.5
Salvelinus sp	8	88.6	19	211.3
Sculpin (unidentified)	1	NA	2	NA
Sea lamprey	38	6,591.5	89	15,576.0
Smallmouth bass	126	64,595.4	296	151,627.1
Splake[1]	8	4,639.9	20	11,424.3
Spottail shiner	742	6,284.6	1,737	14,719.4
Stonecat	70	3,187.7	165	7,603.6
Tadpole madtom	2	10.0	5	23.1
Threespine stickleback	879	1,601.6	2,073	3,773.4
Trout-perch	280	2,777.0	661	6,550.3
White bass	1,428	23,000.2	3,353	54,263.3
White perch	3,706	109,442.5	8,596	258,892.8
White sucker	34	13,595.6	80	32,253.1
Yellow perch	483	23,485.3	1,137	55,423.0
Unidentified	26	10.0	62	23.1
Total	57,931	1,209,603.8	134,847	2,855,750.2

*Common names are according to a list of common and scientific names of fishes from the United States and Canada. 1970. Amer. Fish. Soc. Spec. Publ. No. 6, 3rd ed.

**Weights of undamaged impinged fish.

NA = Not available.

[1]Species identification of lake trout and splake and mottled and slimy sculpin is tentative because of overlapping identifying characteristics.

Alewife and rainbow smelt comprised approximately 75 percent of the total number of fish collected and were the dominant species collected during each month of the study (Appendix Table H-3). Rainbow smelt dominated January, February and December samples, and alewife dominated samples taken from April through August and in October. The abundance of these two species was similar in March, September and November. Seven species (alewife, mottled sculpin, rainbow smelt, rock bass, spottail shiner, white perch, and yellow perch) were collected during every month of the study. Eleven other species were found during at least 9 of the 12 months.

Alewife, gizzard shad, burbot, and rock bass comprised 65 percent of the total fish biomass collected (Table V-B 1 and Appendix Table H-4). Gizzard shad was the dominant species collected during February and March, and from October through December, while alewife dominated samples collected from April through June. Burbot dominated July through September samples and rock bass were dominant only during January.

b. Temporal Distribution

The temporal distribution for total catch rate (number collected per 1000 m^3 of water sampled) was characterized by peak periods of abundance in May, August and November (Figure V-B 1). The temporal abundance of alewife and rainbow smelt followed the same general trend outlined for total catch while gizzard shad were prevalent only during the colder months.

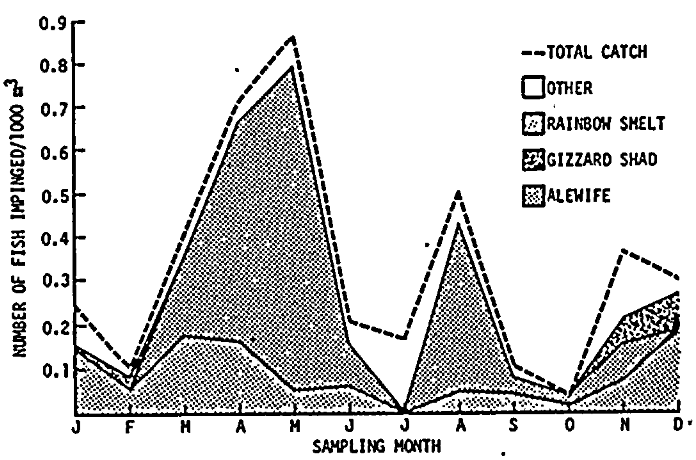


Figure V-B 1. Seasonal Variation in Impingement Rates at Nine Mile Point Nuclear Station Unit 1, January-December 1977

Diel variation in catch rates (number impinged per hour) were observed in day and night impingement samples collected each Wednesday during 1977. Generally, catch per hour was greater at night than during the day but the magnitude of the difference between corresponding noturnal and diurnal catch rates varied from month to month (Figure V-B 2).

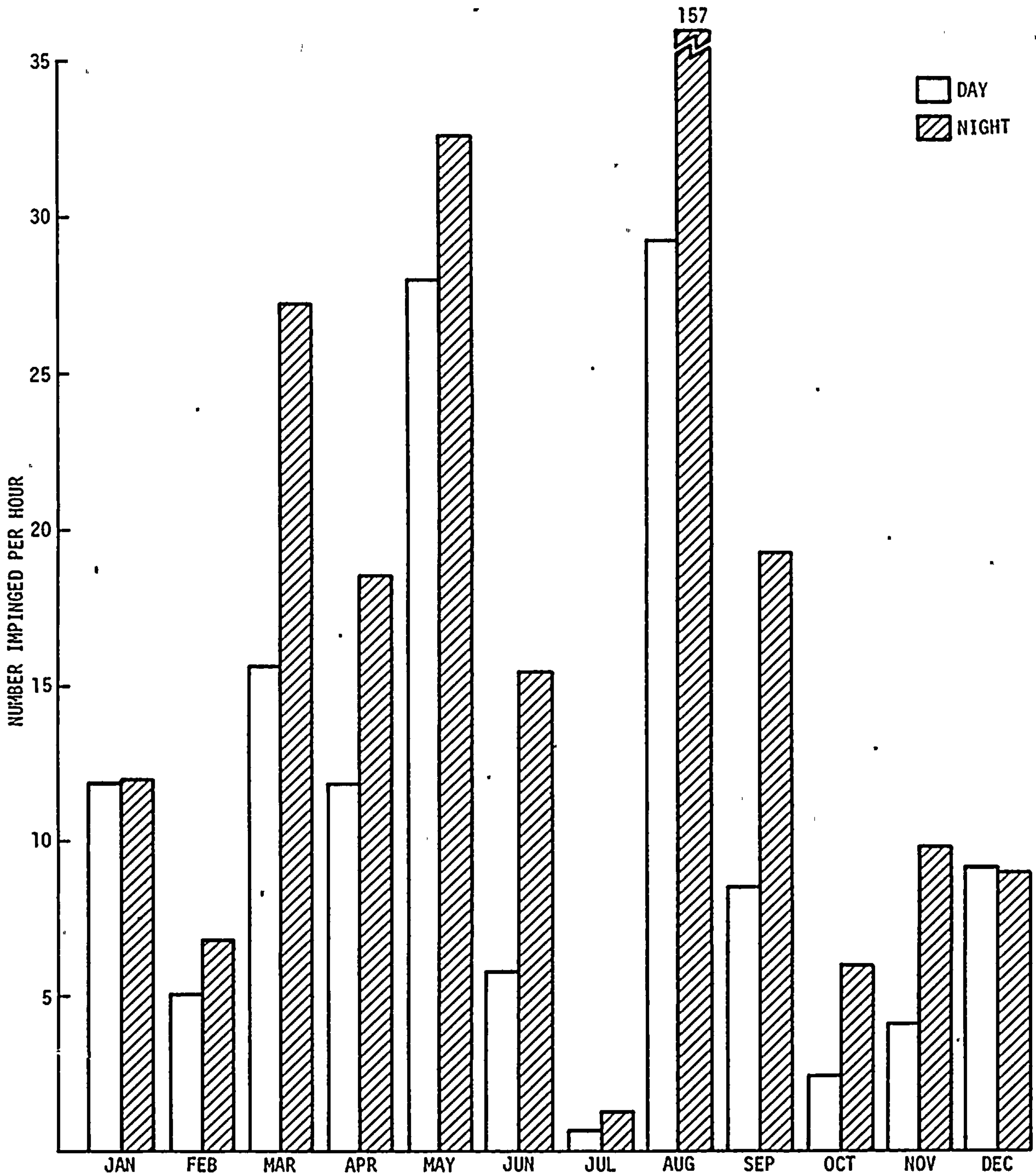


Figure V-B 2. Diel Variation in Impingement Rates at Nine Mile Point Nuclear Station Unit 1 during 1977

c. Estimated Impingement

The estimated total number of fish impinged at Nine Mile Point during January-December 1977 was approximately 135,000 (Table V-B 1). The estimated total weight of these fish was approximately 2900 kilograms. Monthly estimated total numbers and weights are given in Appendix Table H-5.

d. Length Frequency

Length frequency distributions for alewife, rainbow smelt, smallmouth bass, white perch, and yellow perch (Appendix Table H-6 through H-11) showed that generally adult and subadult fish were impinged from January through June or July. Young-of-the-year were first encountered during late spring to mid-summer (June through August) and dominated samples collected from August through December.

Total lengths of impinged threespine stickleback fell within a length range of 21 to 80 millimeters (Appendix Table H-9). Modal lengths of stickleback collected during each month of the study suggested that primarily adult and subadult fish were impinged.

2. James A. FitzPatrick Nuclear Station

a. Species Composition

Impingement sampling at James A. FitzPatrick during 1977 resulted in the collection of 53 fish taxa, 50 of which were identified to species (Table V-B 2). Alewife and rainbow smelt comprised approximately 85 percent of the total number of fish collected. January through June and September through December samples were dominated by one or both of these species and July and August samples were dominated by johnny darter and rock bass (Appendix Table H-12). Five species (alewife, mottled sculpin, rainbow smelt, white perch, and yellow perch) were collected during every sample month. Thirteen other species were found during at least 9 of the 12 months.

Alewife and gizzard shad comprised almost 70 percent of the total fish biomass collected (Table V-B 2 and Appendix Table H-13). Generally, gizzard shad dominated samples taken during January, November and December while alewife was the dominant species collected from March through June. Other species that were prominent at times, in terms of biomass, were rainbow smelt, rock bass, smallmouth bass, and white perch (Appendix Table H-13).

Table V-B 2

Number and Weight of Fish Collected during Impingement Sampling and the Estimated Annual Impingement, James A. FitzPatrick Nuclear Station, 1977

Common Name*	Number Collected	Weight (g)** Collected	Estimated Number	Estimated** Weight (g)
Alewife	80,659	1,518,378.5	185,432	3,585,644.8
American eel	20	6,569.1	62	16,855.2
Black bullhead	1	8.3	8	62.3
Black crappie	14	40.1	39	139.2
Bluegill	49	170.6	119	412.2
Bluntnose minnow	109	238.5	253	553.1
Bowfin	4	216.9	9	503.4
Brassy minnow	13	21.4	30	49.4
Brook stickleback	216	206.2	507	484.2
Brown bullhead	46	4,819.9	119	12,379.2
Brown trout	7	13,193.4	15	31,207.7
Burbot	26	15,697.6	67	37,982.1
Carp	2	4,950.0	5	11,550.0
Central mudminnow	80	354.8	187	833.9
Channel catfish	8	102.5	18	243.2
Chinook salmon	3	2,570.3	7	6,195.3
Cisco	5	206.0	12	487.4
Coho salmon	2	4,134.8	4	9,859.9
Creek chub	2	74.3	5	177.2
Cyprinidae	2	3.3	4	7.8
Emerald shiner	478	1,964.5	1,144	4,655.7
Fathead minnow	11	22.4	25	51.7
Freshwater drum	13	373.2	31	890.0
Gizzard shad	4,550	357,376.5	10,931	844,285.9
Golden shiner	16	152.9	38	361.3
Goldfish	15	2,102.9	36	4,983.4
Johnny darter	365	710.6	953	1,704.2
Lake chub	41	990.1	96	2,460.8
Lake trout[1]	28	329.4	66	853.5
Largemouth bass	4	249.9	14	682.9
Logperch	4	16.4	9	37.8
Longnose dace	5	39.2	11	92.3
Mottled sculpin[1]	1,314	4,307.4	3,137	10,206.2
Northern pike	1	715.2	2	1,705.5
Pumpkinseed	54	2,377.5	128	5,561.4
Rainbow smelt	40,808	167,731.7	98,563	402,614.3
Rainbow trout	1	1,020.9	2	2,355.9
Rock bass	478	74,789.3	1,146	179,578.1
Salvelinus sp	5	50.1	12	119.1
Sea lamprey	18	4,245.3	42	10,063.5
Smallmouth bass	228	126,293.5	538	297,438.6
Splake[1]	12	152.8	28	366.7
Spottail shiner	2,383	11,044.0	5,970	27,325.1
Stonecat	31	1,546.5	73	3,653.1
Tadpole madtom	15	39.8	34	91.8
Threespine stickleback	1,890	3,310.6	4,442	7,772.5
Trout-perch	661	7,250.6	1,550	16,998.0
Walleye	8	112.0	18	265.3
White bass	1,511	41,622.8	3,830	101,832.3
White perch	4,686	260,527.7	11,617	621,417.8
White sucker	29	9,719.5	70	23,637.6
Yellow perch	586	30,353.0	1,495	77,204.1
Unidentified	6	70.1	10	155.3
Total	141,523	2,683,564.8	332,963	6,367,029.3

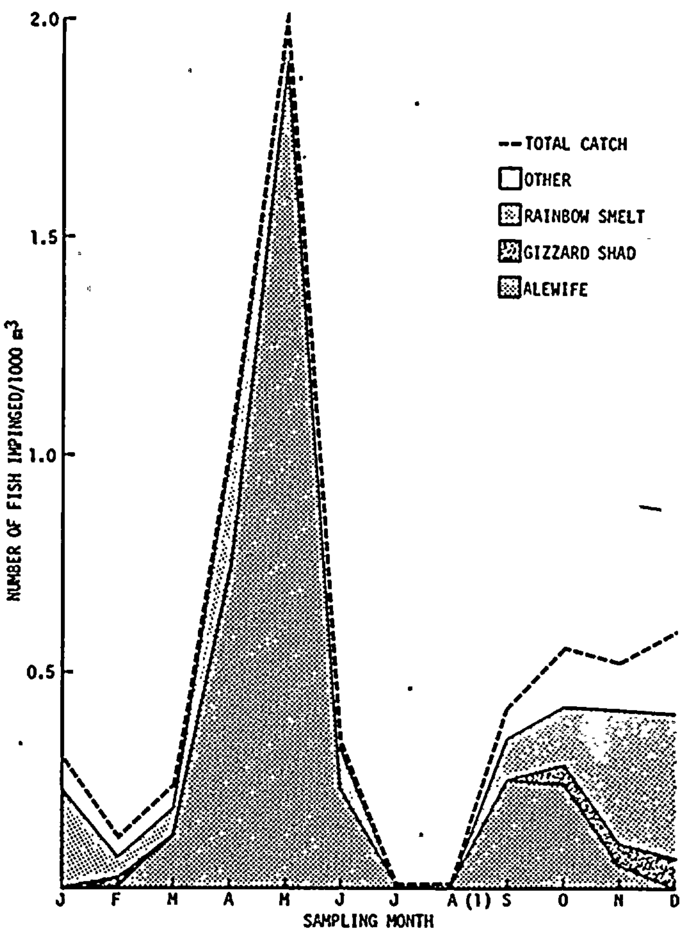
*Common names are according to a list of common and scientific names of fishes from the United States and Canada. 1970. Amer. Fish. Soc. Spec. Publ. No. 6, 3rd ed.

**Weight of undamaged impinged fish.

[1]Species identification of lake trout and splake and mottled and slimy sculpin is tentative because of overlapping identifying characteristics.

b. Temporal Distribution

The temporal distribution for total catch rate (number impinged per 1000 m^3 of water sampled) was characterized by a spring maxima and a winter minima (Figure V-B 3). The traveling screens were inoperable from 22 August through 22 September and samples were not collected during this period. Therefore, catch rates for August were based on samples collected during the first three weeks of the months and September rates were based on samples collected during the last week of September. Catch rates for alewife followed the same general temporal pattern exhibited by the total catch while catch rates for rainbow smelt and gizzard shad were high only during the cooler months.



(1) Traveling screens inoperable from 22 August to 21 September. No samples were taken during this period.

Figure V-B 3. Seasonal Variation in Impingement Rates at James A. FitzPatrick Nuclear Station, January-December 1977

Diel variation in catch rates (number impinged per hour) were observed in day and night impingement samples collected each Wednesday during 1977 (Figure V-B 4). Generally, catch per hour was greater at night, and the magnitude of the difference between corresponding nocturnal and diurnal catch rates varied from month to month.

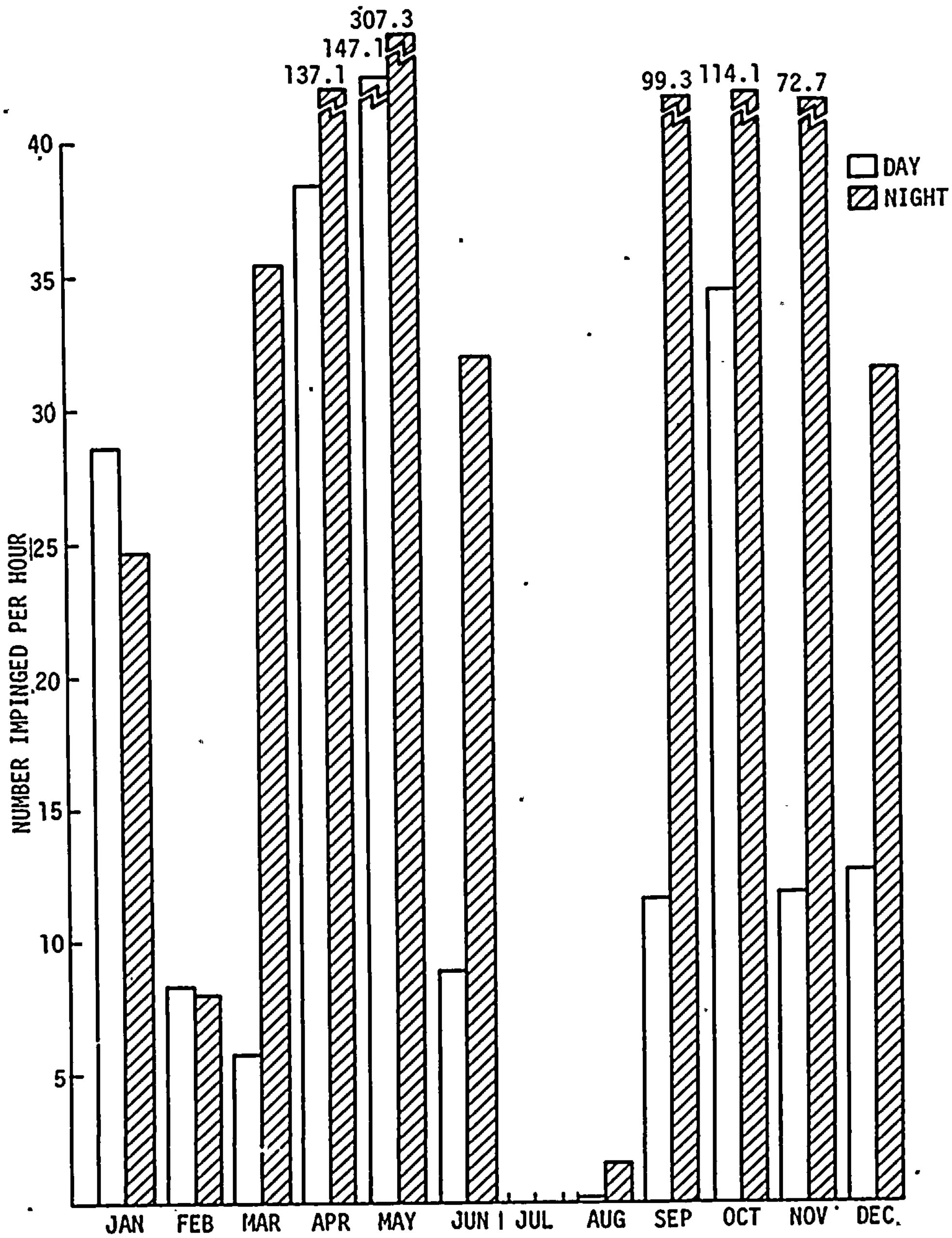


Figure V-B 4. Diel Variation in Impingement Rates at James A. FitzPatrick Nuclear Station during 1977

c. Estimated Impingement

The estimated total number of fish impinged at James A. FitzPatrick was approximately 333,000 (Table V-B 2). The estimated total weight of these fish was approximately 6400 kilograms. Monthly estimated total numbers and weights are listed in Appendix Table H-14.

d. Length-Frequency Distribution

Length-frequency distributions for alewife, rainbow smelt, smallmouth bass, threespine stickleback, white perch, and yellow perch (Appendix Tables H-15 through H-20) showed the same general trends already discussed for these same species impinged at the Nine Mile Point power plant.

e. Age Composition

During each season of impingement sampling the two most abundant species were chosen for age analysis. Age analysis defined the realtive size of the fish in the age classes observed, and these data combined with length-frequency data provided an estimation of ages for the more frequently impinged fish. Alewife and rainbow smelt were chosen for age analysis during each season in 1977 except during summer when rock bass replaced smelt (Appendix Tables H-21 through H-24).

Alewife collected for age analysis ranged from young-of-the-year (age class 0) to age class VI, but no yearlings (age class I) were collected. The seasonal age class distributions (Appendix Tables H-21 to H-24) and the length-frequency distribution for impinged alewife (Appendix Table H-15) indicated that age III, IV, and V fish dominated impingement samples during the winter and spring seasons (January-June) and young-of-the-year fish dominated in the late summer and fall.

Rainbow smelt from impingement collections ranged from young-of-the-year to age class V (Appendix Tables H-21, H-22 and H-24). Length-frequency distributions during the winter and spring were distinctly bimodal (Appendix Table H-6) with large numbers of smelt in the 51- to 100-millimeter and 131- to 180-millimeter length ranges. The age class data indicated that fish in the 51- to 100-millimeter range were predominately yearlings while the second peak represented age class II, III, and IV fish. Later in the year

(September through December), young-of-the-year accounted for most of the impinged smelt and the older fish were less abundant than in the spring.

Age composition data for rock bass are presented in Appendix Table H-23. As expected, young-of-the-year fish were abundant during the summer. Most of the rock bass aged were in age class II, III, or IV, but ages ranged up to age class VIII.

f. Fecundity

White perch spawning usually takes place over a period of 1 to. 8 weeks in the spring when water temperatures range from 11.0 to 15.0°C. The number of eggs produced by a female may range from 20,000 to 300,000 (Scott and Crossman 1973). At James A. FitzPatrick, the total number of yolk eggs (fecundity) for impinged white perch 200 to 288 millimeters in total length ranged from approximately 27,600 to 179,500 (Appendix Table H-25). Fecundity appeared to be related to size of fish examined, increasing with increasing length and weight.

Yellow perch spawn from mid-April to early May when water temperatures range from 8.9 to 12.2°C (Scott and Crossman 1973). Yellow perch eggs are extruded in long, gelatinous structures that frequently become entangled in aquatic vegetation. Fecundity of yellow perch 190 to 275 millimeters in total length impinged at FitzPatrick ranged from approximately 11,500 to 86,300 yolk eggs (Appendix Table H-25). Fecundity of Lake Ontario yellow perch from the Bay of Quinte ranged from 3,035 to 61,465 eggs for fish 131 to 257 millimeters in fork length (Sheri and Power 1969). Ranges of fecundity for yellow perch 147 to 254 mm total length from Maryland was 36,600 to 109,000 eggs (Scott and Crossman 1973).

Smallmouth bass spawn in late spring and early summer, often near rocks, logs, and sometimes in dense vegetation (Scott and Crossman 1973). Nest building takes place over a wide range of temperatures (12.9-20.0°C) but actual spawning usually occurs at temperatures between 16.1 and 18.3°C. The number of eggs spawned (fecundity) ranges from 5,000 to 14,000 and is reported to approximate 7000 eggs per pound of female (Scott and Crossman 1973). The total number of yolk eggs for impinged smallmouth bass at the FitzPatrick station ranged from approximately 5,000 to 26,000 (Appendix Table H-25). Fecundity for

the smallmouth bass collected from the lake in the vicinity of Nine Mile Point ranged up to 20,000 eggs per female (Appendix Table F-34).

Rainbow smelt spawn in streams or shallow lakeshore waters (Rupp 1965) over gravel shoals. Spawning runs of ripe smelt usually begin in March and continue through May when water temperatures range from 8.9 to 18.3°C (McKenzie 1964). The number of demersal and adhesive eggs spawned is dependent upon the size of the female but ranges from approximately 8,000 to 30,000 (Scott and Crossman 1973). Fecundity (total number of yolk eggs) of impinged rainbow smelt was approximately 20,000 eggs (Appendix Table H-25). Fecundity of the smelt examined for lake studies ranged from about 9,100 to 13,600 for fish between 156 and 170 millimeters in total length.

Alewife spawning generally occurs in the late spring when water temperatures are between 16-28°C. Spawning females randomly broadcast from 10,000 to 22,400 (Scott and Crossman 1973; Norden 1967) demersal and essentially nonadhesive eggs (Mansueti 1956). Fecundity of impinged alewife was not documented during 1977. Fecundity of alewife collected by gill nets for lake studies ranged from 10,300 to 20,300 yolk eggs (Appendix Table F-33). Fecundity of these alewife was variable but the larger females usually contained the most eggs.

C. ENTRAINMENT/VIABILITY

1. Nine Mile Point

The cooling water system at Nine Mile Point was sampled at the intake forebay from April through October 1977 to determine how many eggs and larvae were entrained. Alewife eggs were collected in July and unidentified eggs were collected in May, June, and July while larvae of 5 taxa were caught from May through October (Table V-C 1). Few ichthyoplankton taxa were observed in entrainment samples in comparison to the variety of species observed in Lake Ontario during the same time period (subsection IV-E, Table IV-E 1).

Eggs were collected from the first week in May through July with peak densities during late June and early July (Table V-C 2). Prolarvae (yolk-sac larvae) were collected only on 9 May (including rainbow smelt, yellow perch, and burbot) while postlarvae of alewife, white perch, and Morone sp. were observed from 27 July until 25 October. Highest postlarvae densities occurred in late July and early August when alewife dominated catches [see subsection VI.A of the 1977 Data Report (TI 1978)].

In general, the occurrence of eggs and larvae in entrainment samples corresponded with their periods of peak abundance in Lake Ontario (see subsection IV.E on lake ichthyoplankton). Although egg densities within the intake forebay of Nine Mile Point appeared to be about the same as in Lake Ontario (Tables V-C 2 and IV-E 2), larval densities in the lake were apparently higher than larval densities within the intake forebay (Table V-C 2 and Figure IV-E 1). Additionally, the number of species observed in the lake was considerably higher than the number of taxa collected in intake samples (Tables V-C 1 and IV-E 1). Nine Mile Point Unit I was shut down for refueling from early March through mid-July and this may have affected entrainment. However, the relatively low entrainment rates, especially for larvae, were not due entirely to this shutdown because one or both (in June and July) circulating water pumps were kept running during the outage (Appendix Table H-1).

Table V-C 1

Occurrence of Fish Eggs and Larvae in Entrainment Samples from the Cooling-Water Intakes of the Nine Mile Point and James A. FitzPatrick Nuclear Stations, Lake Ontario, 1977

Species	Location[2]	Apr 1[3]	Apr 2	May 1	May 2	Jun 1	Jun 2	Jul 1	Jul 2	Aug 1	Aug 2	Sep 1	Sep 2	Oct 1	Oct 2	Nov 1	Nov 2	Dec 1	Dec 2
Alewife	NMP							E[4]	L[4]	L	L				L				
	JAF							E/L	L	L		[L[5]]		[L]	L	L			
Burbot	NMP			L															
	JAF			[L]															
Carp	NMP			No carp caught at NMP															
	JAF						E												
Johnny darter	NMP			No johnny darters caught at NMP															
	JAF							L	L										
Minnows	NMP			No minnows caught at NMP															
	JAF						E												
Morone sp.[1]	NMP								L				L						
	JAF				L	E/L	L		L										
Rainbow smelt	NMP			L															
	JAF					L													
Trout-perch	NMP			No trout-perch caught at NMP															
	JAF						L												
Yellow perch	NMP			L															
	JAF			L															
Unidentified	NMP			E		E	E		E										
	JAF					E	E		E				[E]						

1. *Morone* sp. includes white perch and white bass
2. Nine Mile Point or James A FitzPatrick
3. First and second half of the month
4. E = eggs L = larvae
5. Eggs or larvae collected during viability studies but not in intake samples

Table V-C 2

Density (No./1000 m^3)* of Eggs and Larvae Entrained at the Nine Mile Point Nuclear Station, Lake Ontario, 1977

Life Stage (all species combined)	Apr 18	Apr 26	May 9	May 19	Jun 13	Jun 27	Jul 11	Jul 27	Aug 10	Aug 26	Sep 14	Sep 26	Oct 11	Oct 25
Eggs	0	0	13	0	31	65	56	8	0	0	0	0	0	0
Larvae	0	0	49	0	0	0	0	76	23	4	3	0	0	2

*Mean density of two daytime samples per sampling date.

2. James A. FitzPatrick Entrainment and Viability

a. Phytoplankton

The potential effect of the James A. FitzPatrick power station operation on the phytoplankton community in the vicinity of the station was monitored by determining chlorophyll a concentrations and primary production levels inside the power station (intake and discharge) and within the thermal plume (actual lake samples or simulation of phytoplankton in the thermal plume; refer to subsection III.B.2 and LMS 1977a).

Chlorophyll a (a photosynthetic pigment) concentrations were measured as an estimate of phytoplankton abundance. In addition, levels of phaeophytin a, (a spectrophotometrically inactive molecule of chlorophyll a), were determined because phaeophytin a optically interferes with the quantitative measurement of chlorophyll a. Phaeophytin a levels also provide an estimate of chlorophyll molecule loss due to either entrainment effects or oxidation during cellular respiration. A radioactive carbon tracer (^{14}C) technique was used to determined the amount of carbon the phytoplankton community can incorporate (primary production) per unit of time.

Chlorophyll a and primary production samples were collected within the intake forebay to monitor the relationship among in-plant samples and the monthly surveys of the lake phytoplankton community. Samples collected at the discharge were compared to intake samples to measure the potential effects of passage of the phytoplankton through the power station.

In addition, simulation studies were conducted to estimate the effects on the phytoplankton community of entrainment into the thermal plume and out to the Δ3°C and Δ2°C isotherms. To perform these simulation studies, phytoplankton samples were collected at the intake and subjected to temperature changes simulating the temperature regime within the thermal plume. For further description on the methods used for simulation samples, refer to subsection III.B.2 on methodology.

1) Chlorophyll a and Phaeophytin a

a) Temporal Distribution

Chlorophyll a concentrations in the cooling water intake, based on the average of two replicate samples incubated at ambient intake temperature for 7 hours, ranged from a low of 0.99 micrograms per liter (µg/ℓ) in November night collections to a high of 15.08 µg/ℓ in May night samples (Appendix Tables J-1 and J-2). Chlorophyll a concentrations were also low in the winter (December-February) and summer (late July and early August) and intermediate during April and late August. Similar seasonal changes were observed in the lake (based on April through December surface samples), where chlorophyll a concentrations ranged from a low of 0.64 µg/ℓ in November to a high of 17.62 µg/ℓ in early May (Appendix Table A-8). These results indicate that estimates of chlorophyll a concentrations at the intake forebay were quite comparable with results from lake surface waters. Chlorophyll a concentrations for intake samples incubated for 24, 48, and 72 hours revealed a temporal distribution pattern and concentrations similar to the 7-hour incubation samples (Appendix Tables J-3 through J-8).

Phaeophytin a concentrations in the samples collected semi-monthly (twice per month) are presented in Appendix Table J-9 for the 7-hour incubation period. Phaeophytin a semi-monthly means (day and night combined) ranged from below detection limits (<0.10 µg/ℓ) during early July to a high of 3.52 µg/ℓ during early October. Phaeophytin a monthly mean concentrations from surface lake samples ranged from a low of 0.18 µg/ℓ during August to a high of 1.95 µg/ℓ in June. A comparison of the monthly mean phaeophytin a concentration from lake samples (Appendix Table A-9) with a monthly mean phaeophytin a value for the intake (a mean of all 7-hour incubation samples collected during the month) indicated no consistent pattern among intake and lake samples.

Intake phaeophytin a results from the 24-, 48-, and 72-hour incubation periods exhibited a similar temporal distribution pattern as the 7-hour incubation period (Appendix Tables J-10 through J-12).

There were no consistent differences among day and night samples collected at the intake or discharge for chlorophyll a and phaeophytin a during any of the incubation periods.

b) Plant Entrainment

Discharge and intake concentrations of chlorophyll a and phaeophytin a were compared (as a ratio of discharge to intake) to evaluate the entrainment effect of the plant on the phytoplankton community. Discharge samples were collected after the intake samples at a specific time interval, depending upon the time required for the water to pass through the plant, to ensure that the same mass of water would be sampled at both the intake and discharge. A ratio less than one represents a decrease in chlorophyll during plant passage, while a ratio larger than one indicates potential stimulation of the phytoplankton community.

Chlorophyll a discharge/intake ratios for the 7-hour incubation revealed that approximately 70 percent of the sampling periods showed a small reduction in chlorophyll a concentration at the discharge (Appendix Tables J-1 and J-2). This excludes the late June through August period when the plant was shut down for refueling. Although discharge/intake ratios were frequently less than one, the loss to the phytoplankton community was not great, as indicated by the frequency of ratios that fell within the range from 0.80 to 0.95.

Results of the chlorophyll a discharge/intake ratios for 24-, 48-, and 72-hour incubation periods revealed a similar trend as found with the 7-hour incubation period (Appendix Tables J-3 through J-8); however, the ratios for the 72-hour incubation period showed approximately 60 percent of the periods exhibited a reduction in chlorophyll a concentrations at the discharge rather than 70 percent (Appendix Tables J-7 and J-8). These results may indicate that the phytoplankton incubated for long periods begin to replace some of the phytoplankton lost to entrainment.

Discharge/intake ratios for phaeophytin a concentrations were variable throughout the 1977 study for the four incubation periods. A comparison of the individual ratios revealed that within each incubation period about half of the sampling periods resulted in a ratio of less than one (Appendix Tables J-9 through J-12).

c) Plume Entrainment

The ratios for the 3° simulation/intake and 2° simulation/intake were determined in order to estimate the effect of entrainment of lake phytoplankton

into the thermal plume. A ratio of less than one would indicate a decrease in chlorophyll a due to entrainment into the thermal plume, while a ratio greater than one may indicate that entrainment of the phytoplankton community into the thermal discharge may stimulate the production of more chlorophyll and/or increase cell reproduction due to the elevated water temperatures.

Chlorophyll a results, based on the 7-hour incubation period, for the 3° simulation/intake ratios indicated that about 60 percent of the samples were less than one, while 65 percent of the 2° simulation/intake ratios were less than one (Appendix Tables J-1 and J-2). Ratios from the 24-, 48-, and 72-hour incubation periods for chlorophyll a showed similar results (Appendix Tables J-3 through J-8).

Phaeophytin a ratios for the four incubation periods indicated that there was a decrease in phaeophytin a in the thermal plume in approximately 55 percent of the samples when the 3° and 2° simulation/intake ratios were considered (Appendix Tables J-9 through J-12).

Ratios for discharge, 3° simulation, and 2° simulation, indicate that overall a small decrease in both chlorophyll a and phaeophytin a concentrations may be indicative of a slight depression in chlorophyll a in the phytoplankton community due to entrainment through the plant or into the thermal plume. Although this depression may represent a loss of phytoplankton cells, the phytoplankton community typically exhibits rapid regeneration which probably negates any entrainment effects within a few hours to several days.

2) Primary Productivity (^{14}C)

a) Temporal Distribution

Primary productivity samples were collected to determine the amount of carbon the phytoplankton community incorporates per unit of time. These samples were collected and incubated at ambient intake temperatures for periods of 7, 24, 48, and 72 hours. The temporal distribution of primary production values for intake samples based on the 7-hour incubation period, showed that lowest production occurred during February, and peak production occurred during July and late August (Appendix Tables J-13 and J-14).

Primary production samples collected in the lake (surface samples) for the phytoplankton surveys exhibited peak values during May and then a decrease in production to generally low values during the remainder of the year. The early May peak in the lake was partially reflected at the intake by a slight increase in production during early May (Appendix Table J-14). However, there was apparently no consistent trend between the lake samples and the 7-hour incubation period intake samples.

Day and night comparisons of primary production at the intake were made with each of the four incubation periods considered individually. Samples from the 7-hour incubation period indicated that 70 percent of the day values were higher than the night values (Appendix Tables J-13 and J-14). The trend of higher carbon uptake during the day would appear to be a natural phenomenon since phytoplankton utilize sunlight for their energy source and the highest rate of respiration occurs during the day. Results from the 24-, 48-, and 72-hour incubation periods showed approximately 55 percent of the day values were higher (Appendix Tables J-15 through J-20). These results, however, are not consistent with the above rationale, since during the longer incubation periods the samples are incubated under a continuous light source. It would be expected that the long length of the 24-, 48-, and 72-hour incubation periods should negate any potential day/night differences as a result of the phytoplankton community not being in its natural habitat with respect to light.

Results from the 7-hour incubation period showed about 55 percent of the discharge/intake ratios for the 12 months were less than one. This indicated a slight loss in phytoplankton abundance probably occurred due to plant entrainment, resulting in a lower production in the discharge (Appendix Tables J-13 and J-14). During January through March and in December when lake water temperatures were low, a stimulation of production in the discharge samples was evident. This was probably due to the effect of the warmer water in the discharge on the rate of production. The 24-, 48-, and 72-hour incubation periods showed ratios for the year that were less than one (Appendix

Tables J-15 through J-20). However, results from the longer incubation periods for primary production analysis tend to be more variable than results from the 7-hour incubation periods and, therefore, may not reflect actual depression in the rates of phytoplankton production as accurately as the 7-hour incubation. The results from all four incubation periods, however, tend to indicate an overall slight decrease of primary production in the discharge compared with the intake, except during the winter months when the 7-hour incubation periods displayed a slight stimulation in production rates in the discharge areas.

c) Plume Entrainment

Results from the 7-hour incubation period for the 3° and 2° simulation/intake ratios indicated that approximately 55 to 60 percent of the ratios were higher than one (Appendix Tables J-13 and J-14). The results indicate that plume entrainment tended to stimulate production during the cool and cold water months. Although samples were not collected during warm water months due to plant shutdown, it is expected that suppression of production rates would tend to occur during the warmer summer months. The 24-hour and 72-hour incubation periods showed that approximately 55 percent of the 3° and 2° simulation/intake ratios were less than one, while approximately 45 percent of the ratios for the 48-hour incubation period were less than one. Overall, the above results for the 3° and 2° isotherm areas of the plume appear to show a slight stimulation of phytoplankton rates of production due to entrainment within the plume area.

b. Zooplankton

1) Entrainment (Intake)

Entrainment sampling (day and night) at the James A. FitzPatrick Power Station intake during 1977 yielded a total of 84 zooplankton taxa comprised primarily of Rotifera, Copepoda (Calanoida, Cyclopoida, and copepod nauplii), Cladocera, and Protozoa (Appendix Tables J-21 and J-22). January through April samples were dominated by copepods, primarily Cyclopoid juveniles and copepod nauplii. These taxa were succeeded in May by rotifers, primarily *Polyarthra* spp., *Keratella* spp. and *Synchaeta* sp., which remained in dominance through September. A variety of rotifers, primarily *Keratella* spp. and *Polyarthra* spp.,

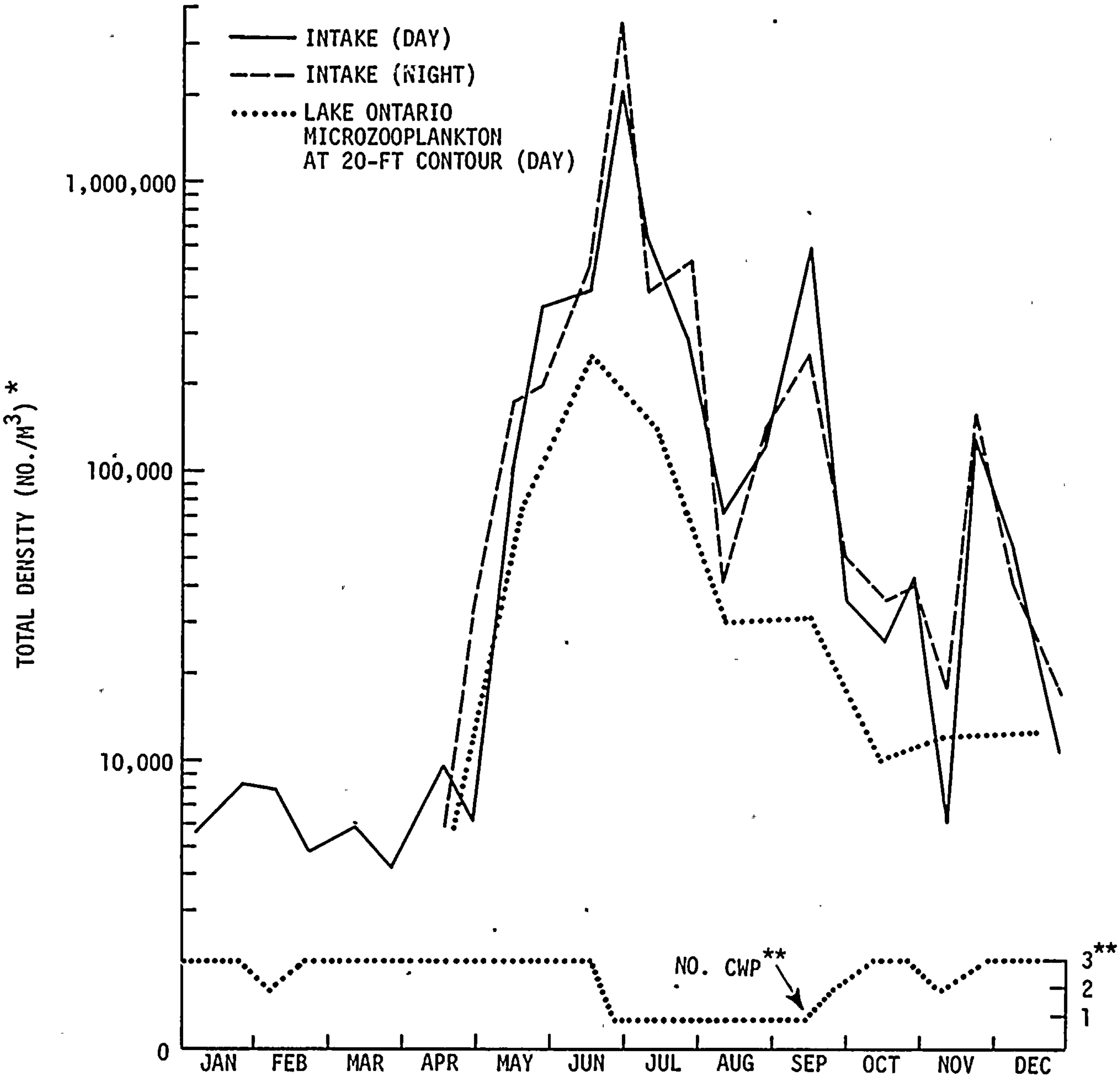
and calanoid and cyclopoid copepods dominated intake samples during the remaining three months of study (October through December). The single most dominant organism throughout the year was the rotifer Keratella earlinea. This species accounted for 24 percent and 22 percent of the zooplankton collected in day and night intake samples respectively.

Temporal distribution of total zooplankton density (Appendix Tables J-23 and J-24) was characterized by an initial period of slightly fluctuating low density levels from January through April, followed by a sharp increase through June when peak density was recorded. Density generally decreased through the remainder of the study, although secondary density peaks were recorded in September and November. Density estimates ranged from a low of 4,100/m^3 in March (day samples) to a high of 3,578,695/m^3 in June (night samples). Numerical abundance estimates during January, February and March (data supplied by LMS) may reflect, in part, the fact that these samples were collected at the discharge rather than the intake although minimum zooplankton density was expected during this period. Temporal density distribution in day and night zooplankton collections were quite similar throughout the study and no consistent trend in day/night density differences was observed.

A comparison of zooplankton entrainment densities with Lake Ontario microzooplankton densities along the 20-foot depth contour indicated a close similarity in seasonal density distributions between intake and lake density (Figure V-C 1). The 20-foot contour was chosen as a basis for comparison because the intake structure is located in water approximately 24 feet deep. A comparison of intake zooplankton density with operational data on the main circulating water pumps (Figure V-C 1) indicates that no consistent cause/effect relationship exists between the number of pumps running and zooplankton density at the intake; that is, density peaks at the intake occurred during periods of both high and low plant circulating water intake.

2) Viability (Intake and Discharge)

Intake and discharge samples at the James A. FitzPatrick Power Station were examined to determine the number of live and dead organisms. The temporal distribution pattern of zooplankton mortality (percent dead) was characterized by a series of peaks and valleys occurring irregularly throughout the year (Table V-C 3 and Appendix Tables J-25 and J-26). Periods of highest zooplankton



*ZOOPLANKTON DENSITY IS PRESENTED ON A LOGARITHMIC SCALE.

**CWP - NUMBER OF CIRCULATING WATER PUMPS OPERATING.

Figure V-C 1. Temporal Distribution of Total Zooplankton Density in Day and Night Entrainment Samples and in Lake Ontario Samples (Day) from the 20-Foot Depth Contour, Nine Mile Point Vicinity, 1977

percent dead at the intake, a reflection of natural and sampling-induced mortality, occurred during April, October, and November in both day and night samples. Lowest intake percent dead generally occurred during winter (January, February and March). In most respects estimates of percent dead at the discharge, a reflection of natural and sampling-induced mortality and mortality due to plant passage, followed a temporal pattern similar to that described for intake samples. Estimates of percent dead at the discharge were generally higher at night; however, this phenomenon occurred less frequently in discharge samples than in intake samples.

Table V-C 3

Percent of Zooplankton Dead# in the Zooplankton Collections Taken at the Intake and Discharge, or Subject to Thermal Plume Simulation, James A. FitzPatrick Power Station, 1977

Sampling Location		Jan* 5-6	Jan* 19-20	Feb 7-8	Feb 16-17	Mar 7-9	Mar 21	Apr 15-19	Apr 27-28	May 11-13	May 25-26	Jun 15-17	**	Sep 13	Sep 29	Oct 3-14	Oct 27	Nov 10-11	Nov 22-23	Dec 8	Dec 27-29	Annual Mean
Intake	Day	53	33	43	41	44	44	51	76	35	16	38		57	54	51	59	72	58	28	65	48
	Night	58	46	59	46	58	48	54	61	45	49	56		59	48	53	64	55	71	41	0	51
Discharge	Day	59	43	41	38	37	44	80	81	59	47	57		51	58	67	85	62	77	31	84	58
	Night	64	63	58	48	47	39	71	77	68	74	78		61	55	57	70	57	82	63	55	62
3° simulation	Day	58	54	46	49	59	54	72	82	43	28	34		52	49	52†	43	40†	71	23	68	51
	Night	65	51	75	46	61	42	85	55	39	46	55		60	50	47	47	79	81	31	64	57
2° simulation	Day	62	55	58	47	51	43	76	59	48	37	42		60	43	36†	53	59†	68	29	65	52
	Night	69	57	66	50	66	40	89	72	57	55	57		43	53	45	55	73	77	29	57	58

*January-March data supplied by Lawler, Matusky, and Skelly Engineers.

**Viability samples not required during plant shutdown.

†Samples taken in actual plume rather than simulated.

#(No. Dead/Total No.) x 100.

In order to estimate the impact of thermal plume entrainment upon zooplankton, a series of experiments were conducted to simulate thermal plume effects at the 3°C and 2°C isotherms (see Section III-B). In general, no salient differences in mortality (percent dead) were observed between the 2° and 3° simulations throughout the year (Table V-C 3). Seasonal distribution of zooplankton percent dead in simulation samples followed quite closely that of intake and discharge, with major peaks occurring in April and November. A comparison of day versus night simulation data revealed no consistent trends in day/night differences in 3° simulations but in 2° simulations mortality (percent dead) was frequently higher at night. A comparison of discharge mortality (percent dead) with plume entrainment mortality (percent dead) indicates that from April through December, mortality was higher in the discharge than either 2° and 3° simulation samples. This indicates that mortality (percent dead) due to plant entrainment is higher than mortality due to thermal plume entrainment during this period.

As an estimate of zooplankton mortality due to plant passage, mortality was computed as the difference between intake and discharge survival divided by intake survival. This method of estimating zooplankton mortality was utilized since it compensates for the effects of sampling-induced mortality. Percent mortality within the major zooplankton groups was generally highest among the Protozoa (Table V-C 4), second highest among the Rotifera, and lowest among the total Copepoda group. Within the Copepoda group, Cyclopoid copepods reflected the lowest percent mortality. In general, no consistent trend in day/night differences in percent mortality among the major zooplankton groups was observed. The only salient trend in zooplankton mortality among the major groups occurred within the Copepoda (Cyclopoida, Copepoda nauplii, and total Copepoda) in which periods of sustained low mortality occurred from February through March.

Temporal distribution in percent mortality due to plant passage for total zooplankton (all taxa combined) was characterized by several peaks occurring irregularly throughout the year (Figure V-C 2). A sustained peak in total zooplankton mortality occurred from April through mid-June, followed by peaks occurring in late October, November, and December. Because of the close similarity in day and night mortality data, only day values are presented in Figure V-C 2. This figure shows a close relationship between zooplankton mortality and plant operation, especially during the latter eight months of the study. The relationship between discharge temperature, ΔT, and zooplankton mortality is perhaps most pronounced during the colder months of October, November, and December, when acclimation temperature (ambient water temperature) is low. In this situation, zooplankton are most susceptible to thermal shock in that a history of cold temperatures results in lower incipient lethal temperatures (Coutant 1970). It should also be noted that thermal stress is not the only factor affecting zooplankton mortality at the James A. FitzPatrick Power station; peak periods in the volume of cooling water used (Figure V-C 2) also coincided with peak zooplankton percent mortality. This indicates that the combined effects of thermal and mechanical stresses are, at least in part, responsible for zooplankton cropping at this power station. Zooplankton percent mortality ranged from negative values (a result of the intake percent dead exceeding discharge percent dead), which occurred most frequently during February and March, to a high of 63 percent in October (Table V-C 4).

Table V-C 4

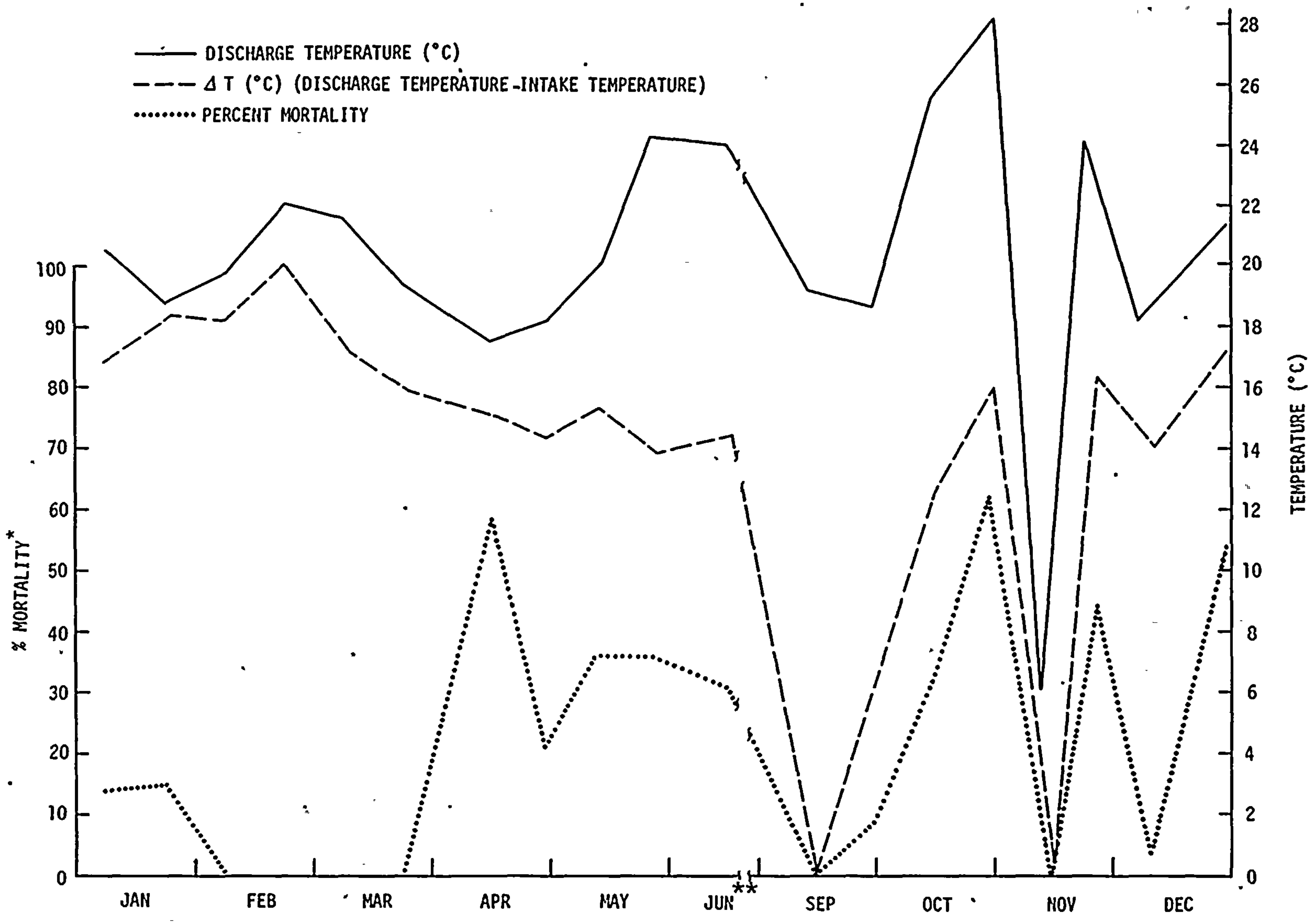
Percent Mortality* of Major Zooplankton Groups Due to Plant Passage, James A. FitzPatrick Plant, 1977

Taxa	Time Period	Jan 5-6	Jan 19-20	Feb 7-8	Feb 16-17	Mar 7-9	Mar 21	Apr 15,19	Apr 27-28	May 11,13	May 25-26	Jun 15,17	Sep 13	Sep 29	Oct 3,14	Oct 27	Nov 10-11	Nov 22-23	Dec 8	Dec 27,29
Protozoa	Day	N	66	34	100	100	N	100	N	13	0	0	0	0	100	N	N	N	N	N
	Night	N	100	N	N	38	N	100	57	N	100	58	33	100	67	100	100	60	N	51
Rotifera	Day	2	21	69	N	21	45	N	87	43	36	21	N	41	72	92	59	65	N	58
	Night	54	19	30	N	45	N	100	66	62	48	60	6	1	N	80	N	67	43	63
Cladocera	Day	29	42	0	ND	ND	0	ND	ND	0	ND	77	N	2	24	41	25	65	3	88
	Night	23	N	ND	ND	0	0	ND	N	0	ND	39	100	20	17	7	14	13	47	9
Calanoida	Day	75	ND	11	48	40	43	69	N	ND	ND	ND	50	50	N	22	ND	N	14	100
	Night	ND	N	20	46	N	N	N	N	ND	N	ND	0	22	38	N	25	51	33	50
Cyclopoida	Day	26	16	0	3	N	2	77	10	N	0	N	N	26	28	40	N	N	11	26
	Night	N	29	N	N	N	N	17	17	N	70	24	N	26	23	N	17	30	29	23
Copepoda nauplii	Day	4	N	N	N	N	N	16	53	N	59	21	N	5	22	100	N	74	N	N
	Night	46	88	ND	29	N	N	100	71	0	27	N	61	N	70	54	15	24	N	18
Total Copepoda	Day	23	8	N	7	N	5	71	13	16	40	19	N	14	19	50	N	20	17	42
	Night	2	42	N	N	N	0	22	N	N	59	28	N	18	37	N	14	25	29	55
Total zooplankton	Day	13	15	N	N	N	0	59	21	37	37	31	N	9	33	63	N	45	4	54
	Night	14	31	N	N	N	N	37	41	42	49	50	5	13	9	17	4	38	37	55

*$\frac{\%\ Live_I - \%\ Live_D}{\%\ Live_I}$; I = intake sample; D = discharge sample.

N = Intake/discharge comparisons not possible; intake mortality ≥ discharge mortality.

ND = No organisms collected at discharge.



$$^{*}\% \text{ Mortality} = \frac{\% \text{ Live}_I - \% \text{ Live}_D}{\% \text{ Live}_I}$$; I = Intake; D = Discharge

**Viability samples not required during plant shutdown.

Figure V-C 2. Percent Mortality of Total Zooplankton Due To Plant Entrainment at James A. FitzPatrick Power Station, 1977

c. Ichthyoplankton

1) Entrainment

Entrainment of fish eggs and larvae into the cooling water system at the James A. FitzPatrick power station was monitored by collecting day and night samples from the intake forebay about every two weeks through 1977. Unidentified eggs and eggs of alewife, carp, minnows, and *Morone* (mostly white perch) were collected during the spring and early summer (Table V-C 1) and a few burbot eggs were collected during the winter (TI 1978). Seven taxa of larvae were observed in intake samples, but only alewife and *Morone* larvae were present during more than two sampling periods.

Fish eggs (all species combined) were collected only during June and July 1977 (Table V-C 5), with the exception of the few burbot eggs caught during February. Alewife and unidentified eggs accounted for most of the eggs collected from the intake during late June and early July when highest egg densities were observed. Alewife eggs were most abundant in intake samples on 14 July, corresponding with the peak lake densities observed on 14 and 18 July (Tables V-C 5 and IV-E 2).

Densities of larvae (all species combined) in entrainment samples reflected the temporal distribution of several species, similar to that observed while surveying ichthyoplankton in Lake Ontario. The small peak in intake forebay larval densities which occurred in May and early June was due primarily to entrainment of yellow perch and rainbow smelt larvae (Table V-C 5). Most larvae, however, were entrained during July and early August and these were mainly alewife, *Morone*, and johnny darter. The biggest catches of johnny darter (151 larvae/1000 m^3) were observed during night sampling of 14 July while the highest concentrations of *Morone* and alewife (70 and 368 larvae/1000 m^3, respectively) occurred on 27 July. Almost all entrained alewife were found in night samples while *Morone* larvae were present in day samples. The relatively few larvae entrained during late October and November were all alewife [see the 1977 Data Report for tabulated entrainment data by species (TI 1978)].

Table V-C 5

Density (No./1000 m^3)* of Eggs and Larvae Entrained at James A. FitzPatrick Nuclear Station, Lake Ontario, 1977

Life Stage (all species combined)	Apr 19	Apr 26	May 8	May 19	Jun 13	Jun 27	Jul 11	Jul 27	Aug 10	Aug 26	Sep 14	Sep 26	Oct 11	Oct 25	Nov 8	Nov 21	Dec 6	Dec 20
Eggs	0	0	0	0	35	163	211	4	0	0	0	0	0	0	0	0	0	0
Larvae	0	0	18	3	13	19	128	223	66	0	0	0	0	10	2	0	0	0

*Mean density of two daytime and two nighttime samples per sampling date.

The average larval densities (all species combined) in entrainment samples were generally lower than densities observed in Lake Ontario, especially in late July when alewife dominated both lake and entrainment samples (Table V-C 5 and Figure IV-E 1). Additionally, only seven taxa of larvae were found in entrainment samples compared to 22 taxa identified in lake samples. At least part of these differences between lake and entrainment samples was the result of a station shutdown from mid-June through late September. The James A. FitzPatrick plant was shut down for refueling and scheduled maintenance and only one of the three main circulating water pumps was operating during the shutdown, reducing the flow of cooling water from about 2,000,000 cubic meters per day to around 650,000 cubic meters per day (Appendix Table H-2).

2) Viability

Percent mortality of eggs and larvae in intake and discharge samples were compared during 1977 to estimate the affect of entrainment through the plant. Also, eggs and larvae from intake samples were subjected to temperature changes to simulate the potential impact of entrainment into the thermal plume in Lake Ontario. This mortality data were presented previously in the 1977 Data Report for the Nine Mile Point Aquatic Ecology Studies (TI 1978). Unfortunately, the number of eggs and larvae in viability samples were quite low precluding any conclusions with respect to mortality or survivability following entrainment.

SECTION VI

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APPENDIX A

PHYTOPLANKTON

Table A-1

TAXONOMIC LIST OF PHYTOPLANKTON COLLECTED IN WHOLE WATER SAMPLES IN THE VICINITY OF NINE MILE POINT, APRIL-DECEMBER 1977

- Cyanophyta
  - Chroococcales
    - Agmenellum sp.
    - Aphanothece sp.
    - Chroococcus sp.
    - Gomphosphaeria lacustris
    - Gomphosphaeria sp.
    - Microcystis sp.
    - Chroococcales Unid.
  - Chamaesiphonales
    - Chamaesiphon sp.
  - Oscillatoriales
    - Lyngbya sp.
    - Oscillatoria limnetica
    - Oscillatoria "LC"
    - Oscillatoria tenuis
    - Oscillatoria sp.
  - Nostocales
    - Anabaena sp.
    - Aphanizomenon flos-aquae
    - Aphanizomenon sp.
    - Nostocales Unid.
- Chlorophyta
  - Volvocales
    - Carteria sp.
    - Chlamydomonas sp.
    - Eudorina sp.
    - Gonium sp.
    - Pandorina morum
    - Pandorina sp.
    - Scourfieldia sp.
    - Spermatozoopsis sp.
    - Volvocales Unid.
  - Tetrasporales
    - Apiocystis brauniana
    - Elakatothrix viridis
    - Elakatothrix sp.
    - Gloeocystis sp.
    - Tetrasporales Unid.
  - Chlorococcales
    - Actinastrum gracilimum
    - Actinastrum hantzschii
    - Actinastrum sp.
    - Ankistrodesmus convolutus
    - Ankistrodesmus falcatus
    - Ankistrodesmus sp.
    - Ankyra sp.
    - Characium sp.
    - Chlorella sp.
    - Chlorococcum sp.
    - Chodatella ciliata
    - Chodatella citriformis
    - Chodatella longiseta
    - Chodatella quadriseta
    - Chodatella sp.
    - Closteriopsis longissima
    - Closteriopsis sp.
    - Coelastrum cambricum
    - Coelastrum microporum
    - Coelastrum proboscidium
    - Coelastrum sp.
    - Crucigenia apiculata
    - Crucigenia quadrata
    - Crucigenia rectangularis
    - Crucigenia tetrapedia
    - Crucigenia sp.
    - Desmatractum sp.
    - Dictyosphaerium ehrenbergianum
    - Dictyosphaerium sp.
    - Didymocystis sp.
    - Echinosphaerella limnetica
    - Franceia sp.
    - Gloeoactinium sp.
    - Golenkinia radiata
    - Golenkinia sp.
    - Kirschneriella contorta
    - Kirschneriella obesa
    - Kirschneriella subsolitaria
    - Kirschneriella sp.
    - Micractinium pusillum
    - Micractinium sp.
    - Nephrocytium sp.
    - Oocystis novae-semliae
    - Oocystis sp.
    - Paradoxia multiseta
    - Pediastrum boryanum
    - Pediastrum duplex
    - Pediastrum simplex
    - Pediastrum tetras
    - Pediastrum sp.
    - Quadrigula sp.
    - Scenedesmus acuminatus
    - Scenedesmus acutus
    - Scenedesmus arcuatus
    - Scenedesmus "B"
    - Scenedesmus bicaudatus
    - Scenedesmus denticulatus
    - Scenedesmus dimorphus
    - Scenedesmus dispar
    - Scenedesmus ecornis
    - Scenedesmus incrassatulus
    - Scenedesmus intermedius
    - Scenedesmus opoliensis
    - Scenedesmus quadricauda
    - Scenedesmus spinosus
    - Scenedesmus trainorii
    - Scenedesmus sp.
    - Schroederia setigera
    - Schroederia sp.
    - Selenastrum sp.
    - Sphaerocystis schroeteri
    - Sphaerocystis sp.
    - Tetraedron caudatum
    - Tetraedron minimum
    - Tetraedron muticum
    - Tetraedron trigonum
    - Tetraedron sp.
    - Tetrastrum heterocanthum
    - Tetrastrum staurogeniaeforme
    - Tetrastrum sp.
    - Treubaria setigerum
    - Treubaria triappendiculata
    - Treubaria sp.
    - Westella sp.
    - Chlorococcales Unid.
  - Ulotrichales
    - Microspora sp.
    - Ulothrix zonata
    - Ulothrix sp.
  - Chaetophorales
    - Chaetophora sp.
    - Stigeoclonium sp.
  - Oedogoniales
    - Oedogonium sp.
  - Cladophorales
    - Cladophora sp.
    - Rhizoclonium sp.
  - Zygnematales
    - Zygnemataceae
      - Mougeotia sp.
    - Desmidiaceae
      - Closterium moniliferum
      - Closterium sp.
      - Cosmarium botrytis
      - Cosmarium cosmetum
      - Cosmarium sp.
      - Staurastrum cuspidatum
      - Staurastrum longiradiatum
      - Staurastrum megacanthum
      - Staurastrum paradoxum
      - Staruastrum sp.
      - Zygnematales Unid.
  - Chlorophyta Unid.
- Euglenophyta
  - Euglenales
    - Euglena sp.
    - Phacus sp.
    - Trachelomonas sp.
    - Euglenales Unid.
- Xanthophyta
  - Heterococcales
    - Peroniella sp.
  - Heterotrichales
    - Tribonema affine
    - Tribonema sp.
  - Rhizochloridales
    - Stipitococcus vas
    - Stipitococcus sp.
- Chrysophyta
  - Chrysomonadales
    - Chrysochromulina parva
    - Chrysochromulina sp.
    - Chrysococcus sp.
    - Dinobryon divergens
    - Dinobryon sertularia
    - Dinobryon sociale
    - Dinobryon sp.
    - Epipyxis sp.
    - Kephyrion sp.
    - Mallamonas sp.
    - Pseudokephyrion sp.
    - Stylobryon sp.
    - Synura sp.
    - Chrysomonadales Unid.
  - Rhizochrysidales
    - Rhizochrysis sp.
  - Monosigales
    - Monosiga sp.
    - Stelexomona dichotoma
    - Monosigales Unid.
  - Chrysophyta Unid.
- Bacillariophyta-centric
  - Eupodiscales
    - Coscinodiscus lacustris
    - Coscinodiscus rothii
    - Coscinodiscus sp.
    - Cyclotella caspia
    - Cyclotella sp.
    - Melosira binderana
    - Melosira islandica
    - Melosira variens
    - Melosira sp.
    - Skeletonema potamus
    - Skeletonema subsalsa
    - Skeletonema sp.
    - Stephanodiscus astraea
    - Stephanodiscus binderana
    - Stephanodiscus hantzschii
    - Stephanodiscus niagarae
    - Stephanodiscus sp.
    - Eupodiscales Unid.
  - Rhizosoleniales
    - Rhizosolenia sp.
  - Biddulphiales
    - Bacteriastrum sp.
  - Bacillariophyta-centric Unid.
- Bacillariophyta-pennate
  - Fragilariales
    - Asterionella formosa
    - Asterionella sp.
    - Diatoma tenue
    - Diatoma vulgare
    - Diatoma sp.
    - Fragilaria crotonensis
    - Fragilaria sp.
    - Meridion sp.
    - Synedra sp.
    - Tabellaria flocculosa
    - Tabellaria sp.
    - Fragilariales Unid.
  - Achnanthales
    - Achnanthes sp.
    - Cocconeis sp.
    - Rhoicosphenia curvata
  - Naviculales
    - Cymbella sp.
    - Gomphonema sp.
    - Gyrosigma sp.
    - Navicula sp.
    - Pinnularia sp.
    - Pleurosigma or Gyrosigma sp.
    - Naviculales Unid.
  - Bacillariales
    - Nitzschia acicularis
    - Nitzschia holsatica
    - Nitzschia sp.
  - Surirellales
    - Surirella sp.
  - Bacillariophyta-pennate Unid.
- Pyrrhophyta-Dinophyceae
  - Gymnodiniales
    - Gymnodinium fuscum
    - Gymnodinium helveticum
    - Gymnodinium sp.
    - Gyrodinium sp.
  - Peridiniales
    - Ceratium hirundinella
    - Peridinium aciculiferum
    - Peridinium gatunense
    - Peridinium pulvisculus
    - Peridinium sp.
    - Peridiniales Unid.
  - Pyrrhophyta-Dinophyceae Unid.
- Cryptophyta
  - Cryptomonadales
    - Chroomonas
    - Cryptomonas marssonii
    - Cryptomanas ovata
    - Cryptomonas reflexa
    - Cryptomonas sp.
    - Monomastix sp.
    - Rhodomonas lacustrus
    - Rhodomonas lens
    - Rhodomonas minuta
    - Rhodomonas sp.
    - Cryptomonadales Unid.
- Unidentified alga

Table A-2

SEASONAL OCCURRENCE AND RELATIVE ABUNDANCE OF THE MORE ABUNDANT PHYTOPLANKTON COLLECTED IN WHOLE WATER SAMPLES IN THE VICINITY OF NINE MILE POINT, 1977

Taxa	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean %
Cyanophyta										
Chroococcales										
Agmenellum sp.			2	4	T	3	1	T		2
Aphanothece sp.			2			T				1
Gomphosphaeria lacustris								2		T
Gomphosphaeria sp.					1	8	34	4		6
Microcystis sp.			24	4	19	5	1		T	7
Oscillatoriales										
Lyngbya sp.			T	T	T	5		T		1
Oscillatoria limnetica		5	2							1
Oscillatoria tenuis								2		T
Oscillatoria sp.	6		3	T	1	12	5	2	10	3
Nostocales										
Anabaena sp.			3	3	3	9	6	1	1	4
Aphanizomenon flos-aquae			1	2	3	3	3			2
Aphanizomenon sp.			3	T	T	1				1
Nostocales Unid.			2	T	T					T
Chlorophyta										
Volvocales										
Chlamydomonas sp.	3	T	1	2	9	T	1	1		3
Pandorina morum			T	T	2					1
Scourfieldia sp.				27	T					7
Volvolcales Unid.	4	1	T	T	T	T	T	T	T	1
Tetrasporales										
Apiocystis brauniana			2							T
Gloeocystis sp.		T	1	2	2	1	T	1		1
Tetrasporales Unid.			6	1	1	T	T			1
Chlorococcales										
Actinastrum sp.		2								T
Ankistrodesmus convolutus		T	T	T	T	T	T	2		T
Ankistrodesmus falcatus	2	1		T	T	T	T		4	1
Ankistrodesmus sp.	T	3	2	T	T	T	T	1		1
Chlorococcum sp.	2						T			T
Coelastrum microporum			1	5	5	8	2	5	T	4
Coelastrum sp.		T	T	1	1	4	1	1	2	1
Dictyosphaerium sp.			2		3	1	T	1		1
Didymocystis sp.	5	3	T						3	1
Micractinium pusillum				2	2	1	T			1
Oocystis sp.			2	1	1	1	1	T	1	1
Pediastrum boryanum		T	1	3	4	1	1	T		2
Pediastrum duplex			T	2	8	1	1	1		2
Pediastrum simplex				T	5	7	3	1		3
Scenedesmus "B"								4		1
Scenedesmus ecornis	T		T	T	4	3	1	1	T	2
Scenedesmus quadricauda	T	1	2	T	2	1	1	1	1	1
Sphaerocystis sp.		T	T		3	1	4	1		1
Chlorococcales Unid.	2	13	9	T	1	2	1	1	3	4
Zygnematales										
Desmidiaceae										
Closterium sp.				T	T	T	1	2	T	T
Chlorophyta Unid.	T	T	1	2	2	3	2	1	T	2
Xanthophyta										
Rhizochloridales										
Stipitococcus sp.							T	3	T	T
Chrysophyta										
Chrysomonadales										
Chrysochromulina parva									2	T
Dinobryon sociale			5	1	T					1
Chrysomonadales Unid.	2	T				5	1	4	5	1
Bacillariophyta-centric										
Eupodiscales										
Melosira sp.	7	6	T	1	T	T	2	1	T	2
Stephanodiscus hantzschii	1	2					T			T
Stephanodiscus niagarae								4	2	T
Stephanodiscus sp.	2	7	T	1	T	T	1	1	2	2
Eupodiscales Unid.	35	27	5	5	1	1	3	11	18	8
Bacillariophyta-pennate										
Fragilariales										
Asterionella formosa	2	2	2	1	T	T	1	6	9	1
Diatoma tenue		4	T	T	T	T				1
Fragilaria crotonensis		T	3	1	1	T	4	8	T	1
Meridion sp.									T	
Bacillariophyta-pennate Unid.	1	5	T	T	T	T	T	T	T	1
Pyrrhophyta										
Peridiniales										
Peridinium sp.	2	T	T	T	T	T	T	T	T	T
Cryptophyta										
Cryptomonadales										
Cryptomonas sp.	2		1	4	2	1	1	2	6	2
Rhodomonas minuta				12	7	3	6	12	14	6
Rhodomonas sp.	21	4	4	1	T	T	2		T	2
Unidentified alga		1	T		T	T	T	T	2	T
Density (No./mℓ)	790.7	4900.0	1585.2	6971.8	4879.1	4903.2	3105.7	842.3	269.4	3138.6

Table A-3

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

CYANOPHYTA

DEPTH CONTOUR	TRANSECT	APR MEAN	APR S.E.*	MAY MEAN	MAY S.E.	JUN MEAN	JUN S.E.	JUL MEAN	JUL S.E.	AUG MEAN	AUG S.E.	SEP MEAN	SEP S.E.
10	NMPW	0.0	0.0	0.0	0.0	301.3	290.1	661.2	614.9	2475.7	1505.0	12.2	12.2
	NMPP	141.5	141.5	0.0	0.0	55.5	55.5	2057.0	1886.2	599.2	263.5	2364.9	218.1
	FITZ	0.0	0.0	0.0	0.0	1075.6	1075.6	981.3	147.9	379.4	73.9	9127.1	4005.6
	NMPE	0.0	0.0	155.7	155.7	1477.0	1446.4	503.6	392.6	159.1	159.1	4952.6	1111.0
CONTOUR MEAN		35.4	35.4	38.9	38.9	727.4	331.2	1050.8	349.8	903.4	531.8	4114.2	1951.9
20	NMPW	0.0	0.0	917.7	350.9	530.5	397.8	1264.2	297.8	752.7	160.1	663.0	231.0
	NMPP	0.0	0.0	0.0	0.0	2459.0	1150.4	330.9	236.3	981.5	345.3	1569.1	72.9
	FITZ	0.0	0.0	424.3	424.3	786.6	786.6	675.9	339.6	1399.4	1024.6	1738.0	164.0
	NMPE	0.0	0.0	0.0	0.0	978.5	628.4	722.5	143.8	575.5	112.6	1602.2	194.1
CONTOUR MEAN		0.0	0.0	335.5	218.3	1188.7	433.3	748.4	192.8	927.3	178.0	1393.1	246.1
40	NMPW	0.0	0.0	411.4	411.4	227.6	20.8	591.7	386.3	283.6	113.4	1435.4	872.2
	NMPP	31.0	31.0	27.7	27.7	551.4	356.9	524.3	349.5	689.3	361.0	364.9	364.9
	FITZ	0.0	0.0	0.0	0.0	1414.2	663.4	353.3	98.5	540.7	82.4	716.5	208.7
	NMPE	0.0	0.0	71.0	71.0	491.8	356.2	1181.7	660.9	1153.3	215.8	1719.7	508.3
CONTOUR MEAN		7.7	7.7	127.5	95.8	671.2	257.5	662.8	180.1	666.7	182.6	1059.1	313.2
41#	NMPE 50%	0.0	0.0	71.0	71.0	67.4	67.4	577.5	39.8	13482.4	12430.0	1792.5	60.8
	25%	83.6	83.6	0.0	0.0	*******	0.0	804.7	168.1	1043.4	472.8	2115.4	818.4
	1%	161.5	161.5	563.3	563.3	7.3	7.3	3085.1	1852.9	130.4	130.4	2233.0	1890.4
60	NMPW	257.2	257.2	743.2	683.3	151.5	19.9	535.8	14.0	462.5	205.9	3553.0	1446.9
	NMPP	25.7	25.7	150.6	150.6	463.9	223.2	558.4	454.3	1332.8	334.2	1041.2	211.5
	FITZ	64.3	64.3	862.7	123.8	14.6	14.6	900.7	391.0	45.1	45.1	1161.9	219.1
	NMPE	0.0	0.0	38.6	38.6	113.0	113.0	625.3	108.2	789.1	43.5	4208.8	627.7
CONTOUR MEAN		86.8	58.3	448.8	207.2	185.7	97.1	655.1	84.1	657.4	271.8	2496.2	811.1
CONTROL MEAN**		32.2	32.2	292.2	127.6	533.9	166.9	760.7	104.0	831.4	259.4	2268.4	622.9
EXP. MEAN**		32.8	17.5	183.2	110.1	852.6	284.4	797.7	197.9	745.9	164.7	2262.9	1004.8
MONTHLY MEAN		32.5	17.7	237.7	82.6	693.2	164.5	779.2	108.1	788.7	148.8	2265.7	571.1
MONTHLY RANGE		0.0- 257.2		0.0- 917.7		7.3- 2459.0		330.9- 3085.1		45.1-13482.4		12.2- 9127.1	

* STANDARD ERROR *******SAMPLES NOT TAKEN, SUBMARINE PHOTOMETER MALFUNCTION

** MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & MNPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

\# 40-FT SAMPLES COLLECTED AT VARIOUS LIGHT PENETRATION LEVELS

Table A-3 (CONTD)

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

CYANOPHYTA

DEPTH CONTOUR	TRAN-SECT	OCT MEAN	OCT S.E.*	NOV MEAN	NOV S.E.	DEC MEAN	DEC S.E.
10	NMPW	608.4	434.4	631.0	81.2	0.0	0.0
	NMPP	1323.5	337.4	0.0	0.0	0.0	0.0
	FITZ	1581.5	1381.4	50.2	50.2	0.0	0.0
	NMPE	552.7	170.7	8.4	8.4	312.4	254.7
CONTOUR MEAN		1016.5	257.4	172.4	153.3	78.1	78.1
20	NMPW	233.4	191.9	38.6	38.6	0.0	0.0
	NMPP	4.4	4.4	0.0	0.0	41.7	41.7
	FITZ	2768.2	1745.7	782.4	782.4	5.8	5.8
	NMPE	0.0	0.0	55.7	44.6	104.9	58.1
CONTOUR MEAN		751.5	674.4	219.2	188.1	38.1	24.1
40	NMPW	1239.4	175.0	0.0	0.0	2.4	2.4
	NMPP	201.6	1.0	0.0	0.0	6.5	6.5
	FITZ	3318.7	1617.3	0.0	0.0	73.1	73.1
	NMPE	2147.0	1176.6	0.0	0.0	0.0	0.0
CONTOUR MEAN		1726.7	663.0	0.0	0.0	20.5	17.6
41#	NMPE 50%	330.3	55.4	0.0	0.0	29.6	5.5
	25%	8776.6	8707.2	0.0	0.0	0.0	0.0
	1%	1084.7	889.5	146.6	146.6	0.0	0.0
60	NMPW	404.3	359.2	15.1	15.1	23.4	23.4
	NMPP	2441.0	824.7	75.2	75.2	32.3	32.3
	FITZ	1251.6	322.8	3.9	3.9	0.0	0.0
	NMPE	2787.7	138.8	185.6	185.6	2.5	2.5
CONTOUR MEAN		1721.2	548.5	69.9	41.6	14.6	7.9
CONTROL MEAN**		996.6	350.1	116.8	76.6	55.7	38.8
EXP. MEAN**		1611.3	416.7	114.0	96.0	19.9	9.5
MONTHLY MEAN		1304.0	274.6	115.4	59.3	37.8	19.8
MONTHLY RANGE		0.0- 8776.6		0.0- 782.4		0.0- 312.4	

* STANDARD ERROR

** MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

\# 40-FT SAMPLES COLLECTED AT VARIOUS LIGHT PENETRATION LEVELS

Table A-4

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

CHLOROPHYTA

DEPTH CONTOUR	TRAN-SECT	APR MEAN	APR S.E.*	MAY MEAN	MAY S.E.	JUN MEAN	JUN S.E.	JUL MEAN	JUL S.E.	AUG MEAN	AUG S.E.	SEP MEAN	SEP S.E.
10	NMPW	208.5	95.4	2295.9	153.1	841.6	154.7	1805.6	650.6	2293.4	1231.3	2024.6	252.8
	NMPP	148.5	18.7	2599.8	173.7	384.8	140.4	6055.2	1061.1	2774.6	445.3	1737.4	616.1
	FITZ	196.7	16.7	1282.1	36.3	456.9	51.2	2905.0	701.3	6261.4	1217.0	1617.3	261.2
	NMPE	86.8	63.7	363.4	330.6	338.6	29.0	2985.9	1674.2	3926.1	541.7	2279.7	150.9
CONTOUR MEAN		160.1	27.7	1635.3	509.0	505.5	114.7	3438.0	913.0	3813.9	884.8	1914.7	148.7
20	NMPW	82.4	43.9	1158.4	103.3	1130.3	176.7	4277.5	495.4	6348.4	450.3	1171.5	320.1
	NMPP	93.2	67.3	775.0	398.6	621.1	253.1	4303.5	859.3	2589.3	108.2	1878.3	19.2
	FITZ	246.2	128.1	1983.3	17.5	422.8	121.4	2857.2	826.0	3020.9	545.5	4626.3	318.9
	NMPE	217.2	176.3	1578.7	1179.4	255.3	92.2	3043.9	1900.0	3227.5	293.3	2166.7	64.5
CONTOUR MEAN		159.8	42.0	1373.9	261.2	607.4	189.6	3620.5	388.7	3796.5	860.9	2465.7	750.9
40	NMPW	39.3	19.7	1796.4	37.9	1441.5	608.3	3234.2	760.4	2066.2	115.3	1293.1	281.0
	NMPP	192.4	109.3	1422.7	560.6	729.1	296.8	5121.9	455.9	3330.5	726.4	876.1	153.9
	FITZ	174.1	85.4	1292.5	78.9	370.3	25.6	3790.5	1300.8	2580.3	442.2	1703.6	579.6
	NMPE	115.4	64.6	164.1	25.3	221.0	25.5	2520.7	548.4	2816.0	204.9	1114.2	250.0
CONTOUR MEAN		130.3	34.5	1168.9	351.5	690.5	272.1	3666.8	550.2	2698.2	262.5	1246.7	174.6
41#	NMPE 50%	115.4	64.6	164.1	25.3	73.2	11.9	3519.5	24.3	3122.8	1152.8	1839.1	396.7
	25%	90.7	12.2	558.2	180.1	*******	0.0	3431.3	1484.9	2782.2	884.1	2146.3	2.4
	1%	145.8	14.6	1394.2	79.9	118.7	16.9	4095.8	67.9	3361.2	1373.3	2231.1	1199.8
60	NMPW	326.2	94.7	1265.2	552.0	321.2	100.9	4167.3	359.4	2583.5	543.6	1833.7	164.0
	NMPP	159.9	33.0	918.4	601.6	472.5	287.3	3927.0	280.6	2926.9	631.1	2207.3	386.0
	FITZ	64.3	25.7	1751.2	131.0	77.4	63.7	5161.5	2330.1	2304.5	26.2	1298.0	192.7
	NMPE	95.9	70.2	672.7	50.5	644.4	378.0	7280.3	1259.1	3871.0	492.4	3624.3	358.1
CONTOUR MEAN		161.6	58.4	1151.9	233.8	378.9	120.2	5134.0	763.7	2921.5	341.1	2240.8	497.5
CONTROL MEAN**		146.5	33.8	1161.9	258.6	649.2	160.3	3664.4	590.1	3391.5	486.1	1941.0	290.4
EXP. MEAN**		159.4	20.6	1503.1	209.9	441.9	67.8	4265.2	399.0	3223.6	447.8	1993.0	401.2
MONTHLY MEAN		152.9	19.2	1332.5	166.8	545.6	89.2	3964.8	352.7	3307.5	320.0	1967.0	239.3
MONTHLY RANGE		39.3- 326.2		164.1- 2599.8		73.2- 1441.5		1805.6- 7280.3		2066.2- 6348.4		876.1- 4626.3	

* STANDARD ERROR ******* SAMPLES NOT TAKEN, SUBMARINE PHOTOMETER MALFUNCTION

** MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

\# 40-FT SAMPLES COLLECTED AT VARIOUS LIGHT PENETRATION LEVELS

Table A-4 (CONTD)

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

CHLOROPHYTA

DEPTH CONTOUR	TRANSECT	OCT MEAN	OCT S.E.*	NOV MEAN	NOV S.E.	DEC MEAN	DEC S.E.
10	NMPW	658.9	83.4	244.0	11.1	112.8	78.1
	NMPP	956.0	836.6	167.8	103.1	65.9	58.2
	FITZ	664.0	348.4	136.5	15.3	4.7	3.9
	NMPE	827.1	233.9	387.8	18.5	45.2	27.0
CONTOUR MEAN		776.5	71.5	234.0	56.0	57.4	22.4
20	NMPW	237.4	0.3	314.4	85.3	60.3	29.2
	NMPP	305.7	172.6	371.8	136.9	37.4	18.1
	FITZ	1064.1	102.0	269.3	79.8	6.9	6.9
	NMPE	1002.9	339.7	121.8	41.2	53.5	30.9
CONTOUR MEAN		652.5	220.7	269.3	53.5	39.5	11.9
40	NMPW	629.9	133.5	261.1	7.3	74.3	53.1
	NMPP	393.7	82.8	251.9	83.5	59.8	.2.7
	FITZ	923.0	101.5	151.9	18.2	10.9	4.2
	NMPE	1069.5	148.8	117.7	63.6	21.3	12.3
CONTOUR MEAN		754.0	150.9	195.7	35.9	41.6	15.1
41#	NMPE 50%	316.0	208.2	449.0	57.4	28.9	28.9
	25%	187.0	89.0	140.2	20.3	37.7	34.6
	1%	1611.4	230.4	580.4	343.7	128.3	92.5
60	NMPW	377.4	25.3	142.7	69.2	31.2	2.6
	NMPP	1143.7	54.8	119.9	45.6	20.3	9.0
	FITZ	431.1	144.4	259.3	91.8	54.7	20.7
	NMPE	2473.5	1411.2	149.9	18.6	38.2	16.3
CONTOUR MEAN		1106.4	488.0	168.0	31.1	36.1	7.2
CONTROL MEAN**		909.6	245.1	217.4	35.4	54.7	10.2
EXP. MEAN**		735.1	116.3	216.0	30.6	32.6	8.9
MONTHLY MEAN		822.4	133.0	216.7	22.6	43.7	7.1
MONTHLY RANGE		187.0-	2473.5	117.7-	580.4	4.7-	128.3

* STANDARD ERROR

** MEANS ARE FOR SURFACE SAMPLES ONLY: CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

\# 40-FT SAMPLES COLLECTED AT VARIOUS LIGHT PENETRATION LEVELS

Table A-5

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

BACILLARIOPHYTA-CENTRIC

DEPTH CONTOUR	TRANSECT	APR MEAN	APR S.E.*	MAY MEAN	MAY S.E.	JUN MEAN	JUN S.E.	JUL MEAN	JUL S.E.	AUG MEAN	AUG S.E.	SEP MEAN	SEP S.E.
10	NMPW	1700.9	109.8	3056.8	574.2	99.6	62.6	1043.6	279.7	124.2	24.3	36.5	36.5
	NMPP	610.7	374.0	4666.7	861.0	13.5	13.5	381.3	85.6	40.3	0.2	101.0	0.7
	FITZ	366.0	196.3	2492.7	29.7	55.2	7.5	595.0	252.2	114.8	76.2	738.3	260.9
	NMPE	227.5	42.4	1620.6	866.4	30.1	7.0	184.0	19.1	5.3	5.3	183.7	55.5
CONTOUR MEAN		726.3	334.4	2959.2	641.3	49.6	18.7	551.0	184.4	71.2	28.9	264.9	160.7
20	NMPW	427.0	259.8	3664.7	329.6	455.4	45.7	1211.7	123.6	397.0	174.8	19.1	14.7
	NMPP	161.3	87.8	1124.8	22.9	70.1	39.8	645.2	199.5	71.2	27.2	128.5	69.1
	FITZ	205.9	26.9	3124.9	877.5	66.4	15.1	375.3	45.5	133.2	25.8	242.1	197.3
	NMPE	229.5	125.9	2884.0	1335.9	23.6	5.9	348.2	56.9	11.6	11.6	145.8	30.1
CONTOUR MEAN		255.9	58.7	2699.6	549.7	153.9	101.1	645.1	200.4	153.2	85.0	133.9	45.7
40	NMPW	180.5	78.7	2566.0	909.7	522.6	444.2	1155.3	467.2	49.3	39.8	41.5	20.3
	NMPP	179.3	130.7	1888.4	237.9	85.5	43.0	970.9	97.1	87.8	16.4	50.4	45.4
	FITZ	228.8	30.7	2256.8	481.5	36.7	11.8	332.1	155.7	170.5	45.9	85.9	24.4
	NMPE	194.6	27.4	360.0	12.8	28.1	2.7	590.2	40.4	23.1	23.1	65.0	49.6
CONTOUR MEAN		195.8	11.5	1767.8	489.3	168.2	118.8	762.1	185.4	82.7	32.1	60.7	9.7
41#	NMPE 50%	194.6	27.4	360.0	12.8	49.0	43.2	485.2	89.4	39.6	33.7	88.0	15.4
	25%	200.0	10.9	444.7	66.7	*******	0.0	570.5	152.9	5.8	5.8	151.7	90.9
	1%	403.8	123.0	2433.1	489.8	4.1	1.4	266.4	49.9	15.0	15.0	49.7	0.3
60	NMPW	353.7	142.8	1614.2	544.3	13.8	1.1	1271.9	50.9	30.7	13.3	79.4	33.1
	NMPP	273.0	247.2	1057.2	625.7	54.9	54.9	1164.1	41.3	17.2	5.2	197.8	77.2
	FITZ	218.6	32.2	2072.1	170.9	10.4	7.5	599.8	246.9	19.8	4.7	40.7	5.2
	NMPE	313.6	27.1	628.5	209.8	15.5	9.7	951.9	25.1	9.6	9.6	248.0	38.1
CONTOUR MEAN		289.7	28.9	1343.0	315.9	23.7	10.5	997.0	148.1	19.3	4.4	141.5	48.8
CONTROL MEAN**		453.4	180.7	2049.3	419.0	148.6	75.2	844.6	147.1	81.4	47.1	102.4	28.9
EXP. MEAN**		280.4	52.3	2335.5	411.0	49.1	9.5	633.0	105.2	81.8	19.6	198.1	81.0
MONTHLY MEAN		366.9	93.6	2192.4	285.9	98.8	38.8	738.8	91.5	81.6	24.6	150.2	43.3
MONTHLY RANGE		161.3- 1700.9		360.0- 4666.7		4.1- 522.6		184.0- 1271.9		5.3- 397.0		19.1- 739.3	

* STANDARD ERROR *******SAMPLES NOT TAKEN, SUBMARINE PHOTOMETER MALFUNCTION

** MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & MNPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

\# 40-FT SAMPLES COLLECTED AT VARIOUS LIGHT PENETRATION LEVELS

Table A-5 (CONTD)

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

BACILLARIOPHYTA-CENTRIC

DEPTH CONTOUR	TRANSECT	OCT MEAN	OCT S.E.*	NOV MEAN	NOV S.E.	DEC MEAN	DEC S.E.
10	NMPW	225.6	102.6	207.2	29.2	54.7	2.0
	NMPP	483.2	158.8	116.0	64.2	49.1	1.4
	FITZ	588.5	229.4	206.6	41.9	32.1	15.1
	NMPE	471.8	114.9	167.5	54.6	72.8	36.4
CONTOUR MEAN		442.3	76.9	174.3	21.6	52.2	8.4
20	NMPW	116.1	47.3	143.4	46.4	73.7	1.5
	NMPP	148.9	48.6	264.6	32.3	67.1	10.7
	FITZ	342.4	12.5	215.5	61.0	29.9	20.7
	NMPE	279.2	91.1	143.6	68.4	140.0	8.7
CONTOUR MEAN		221.7	53.5	191.8	29.6	77.7	22.9
40	NMPW	320.7	105.4	120.7	32.7	56.7	6.5
	NMPP	59.6	17.5	141.9	40.6	135.8	19.9
	FITZ	565.0	360.8	178.8	75.8	46.7	5.0
	NMPE	502.2	170.4	189.4	87.4	74.4	21.7
CONTOUR MEAN		361.9	113.3	157.7	16.0	78.4	20.0
41#	NMPE 50%	160.3	6.1	379.1	270.1	62.5	57.5
	25%	95.6	34.8	222.5	39.8	33.8	27.0
	1%	246.9	58.6	154.5	83.0	236.2	95.3
60	NMPW	151.5	26.5	19.2	11.0	75.2	51.2
	NMPP	381.4	147.2	78.8	16.6	20.5	3.7
	FITZ	394.1	207.5	92.0	16.8	75.4	13.7
	NMPE	176.5	78.7	132.6	17.3	75.5	24.0
CONTOUR MEAN		275.9	64.8	80.7	23.5	61.7	13.7
CONTROL MEAN**		280.5	50.9	140.5	20.2	77.9	9.4
EXP. MEAN**		370.4	66.2	161.8	23.1	57.1	13.0
MONTHLY MEAN		325.4	42.0	151.1	15.1	67.5	8.2
MONTHLY RANGE		59.6-	588.5	19.2-	379.1	20.5-	236.2

* STANDARD ERROR

** MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

\# 40-FT SAMPLES COLLECTED AT VARIOUS LIGHT PENETRATION LEVELS

Table A-6

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

BACILLARIOPHYTA-PENNATE

DEPTH CONTOUR	TRAN-SECT	APR MEAN	APR S.E.*	MAY MEAN	MAY S.E.	JUN MEAN	JUN S.E.	JUL MEAN	JUL S.E.	AUG MEAN	AUG S.E.	SEP MEAN	SEP S.E.
10	NMPW	52.0	12.4	565.6	65.6	110.9	98.6	67.5	13.5	18.7	9.8	34.3	14.4
	NMPP	28.0	2.3	1287.0	101.6	29.3	29.3	112.8	112.8	203.7	6.9	127.3	52.1
	FITZ	5.1	5.1	1435.7	670.2	13.1	13.1	141.1	141.1	4.8	4.8	26.0	26.0
	NMPE	15.7	7.4	614.7	195.0	51.0	19.9	155.3	135.1	164.4	164.4	6.0	6.0
CONTOUR MEAN		25.2	10.1	975.8	224.9	51.1	21.4	119.2	19.4	97.9	50.5	48.4	27.0
20	NMPW	18.3	1.0	710.1	304.7	183.1	155.3	86.8	53.6	29.3	10.8	30.4	30.4
	NMPP	23.1	5.0	420.2	139.9	43.1	12.4	51.2	14.8	170.9	39.0	97.9	25.5
	FITZ	9.9	8.1	1120.1	238.6	21.2	21.2	102.0	102.0	71.5	10.0	191.0	123.8
	NMPE	50.1	36.5	889.2	637.5	85.1	24.9	168.5	164.6	31.1	15.2	9.6	9.6
CONTOUR MEAN		25.4	8.7	784.9	147.7	83.1	35.9	102.1	24.5	75.7	33.2	82.2	40.9
40	NMPW	25.6	6.8	1264.6	385.4	149.8	57.0	13.8	13.8	15.7	11.7	137.9	116.7
	NMPP	28.4	11.0	823.1	80.5	51.2	33.8	424.0	346.3	134.5	134.5	20.6	20.6
	FITZ	39.9	9.1	870.2	6.2	148.2	140.6	197.1	166.3	120.3	80.9	61.7	48.7
	NMPE	40.0	1.4	84.5	30.1	18.5	12.3	108.0	108.0	161.0	156.3	3.9	3.9
CONTOUR MEAN		33.5	3.8	760.6	246.1	91.9	33.6	185.7	87.8	107.9	31.9	56.0	29.9
41#	NMPE 50%	40.0	1.4	84.5	30.1	192.8	173.7	88.9	44.1	54.2	17.6	0.9	0.9
	25%	9.0	3.9	78.6	29.4	*******	0.0	28.9	28.9	124.4	26.0	85.6	30.5
	1%	22.1	6.0	824.0	58.5	61.4	46.8	292.8	227.0	194.9	103.0	253.9	148.2
60	NMPW	94.5	52.1	258.9	179.2	93.7	90.3	115.4	6.2	194.3	194.3	72.4	0.9
	NMPP	38.3	11.3	223.3	80.7	51.2	51.2	231.1	69.8	72.5	59.1	101.8	80.5
	FITZ	28.9	9.6	876.0	36.5	15.6	11.3	484.3	305.1	22.6	22.6	25.1	3.8
	NMPE	5.3	1.1	106.5	76.1	27.2	1.5	742.2	222.1	26.0	26.0	98.0	7.0
CONTOUR MEAN		41.8	18.9	366.2	173.0	46.9	17.3	393.3	139.5	78.8	40.1	74.3	17.7
CONTROL MEAN**		37.7	10.0	561.8	143.5	89.9	20.4	182.2	61.8	80.1	27.5	49.1	17.3
EXP. MEAN**		25.2	4.4	882.0	145.0	46.6	15.5	217.9	55.5	100.1	24.6	81.4	21.2
MONTHLY MEAN		31.5	5.5	72[illegible].9	106.9	68.2	13.6	200.	48.0	90.1	18.0	65.2	13.9
MONTHLY RANGE		5.1-	94.5	78.6-	1435.7	13.1-	192.8	13.8-	742.2	4.8-	203.7	0.9-	283.9

* STANDARD ERROR *******SAMPLES NOT TAKEN, SUBMARINE PHOTOMETER MALFUNCTION

** MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & MNPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

\# 40-FT SAMPLES COLLECTED AT VARIOUS LIGHT PENETRATION LEVELS

Table A-6 (CONTD)

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

BACILLARIOPHYTA-PENNATE

DEPTH CONTOUR	TRAN-SECT	OCT MEAN	OCT S.E.*	NOV MEAN	NOV S.E.	DEC MEAN	DEC S.E.
10	NMPW	88.3	67.9	19.5	5.8	26.4	9.5
	NMPP	205.4	179.4	46.2	15.0	22.6	10.5
	FITZ	178.7	114.5	43.1	9.9	7.3	2.9
	NMPE	325.8	50.9	373.6	253.4	38.4	3.3
CONTOUR MEAN		199.5	49.0	120.6	84.5	23.7	6.4
20	NMPW	43.5	43.5	159.3	97.6	28.8	27.3
	NMPP	17.1	17.1	15.3	15.3	22.2	1.4
	FITZ	487.6	23.7	28.6	28.6	6.8	6.8
	NMPE	174.6	149.5	192.1	150.2	79.8	14.2
CONTOUR MEAN		180.7	107.9	98.8	45.0	34.4	15.8
40	NMPW	405.1	264.6	96.8	54.4	8.7	8.2
	NMPP	59.8	40.5	13.1	6.0	33.2	0.8
	FITZ	54.8	54.8	230.1	26.4	20.0	7.1
	NMPE	704.8	277.6	251.5	111.7	56.3	0.1
CONTOUR MEAN		306.1	156.2	147.9	56.5	29.6	10.2
41#	NMPE 50%	194.4	187.1	395.5	214.1	8.0	8.0
	25%	4.3	4.3	72.7	57.8	28.5	28.5
	1%	479.4	280.3	33.9	22.6	78.1	23.5
60	NMPW	1.5	1.5	8.7	6.5	22.4	2.6
	NMPP	206.3	85.4	299.2	188.9	17.4	0.6
	FITZ	86.0	77.4	82.0	82.0	27.1	24.7
	NMPE	742.1	59.2	418.6	153.1	27.6	11.7
CONTOUR MEAN		259.0	166.4	202.1	94.9	23.6	2.4
CONTROL MEAN**		310.7	102.3	190.0	53.7	36.1	7.9
EXP. MEAN**		162.0	53.3	94.7	39.4	19.6	3.2
MONTHLY MEAN		236.3	58.9	142.4	34.2	27.8	4.6
MONTHLY RANGE		1.5- 742.1		8.7- 418.6		6.8- 79.8	

* STANDARD ERROR

** MEANS ARE FOR SURFACE SAMPLES ONLY: CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

\# 40-FT SAMPLES COLLECTED [illegible]ARIOUS LIGHT PENETRATION LEVELS

Table A-7

ABUNDANCE (CELLS/MILLILITER) OF PHYTOPLANKTON IN WHOLE WATER COLLECTIONS, NINE MILE POINT VICINITY, 1977

TOTAL PHYTOPLANKTON

DEPTH CONTOUR (FT)	TRANSECT	15 APR MEAN	15 APR S.E.*	11 MAY MEAN	11 MAY S.E.	16 JUN MEAN	16 JUN S.E.	15 JUL MEAN	15 JUL S.E.	12 AUC MEAN	12 AUC S.E.	16 SEP MEAN	16 SEP S.E.	13 OCT MEAN	13 OCT S.E.	8 NOV MEAN	8 NOV S.E.	14 DEC MEAN	14 DEC S.E.
10	NMPW	2098.5	21.8	6331.1	897.4	1640.5	365.0	4378.1	1628.1	5343.3	2990.9	2560.1	300.6	1807.6	598.1	1293.5	172.0	323.6	22.7
	NMPP	1194.6	327.9	9065.9	859.4	582.7	197.0	9866.4	2958.9	4057.3	862.8	5042.0	1035.4	3366.3	1438.1	555.5	150.7	201.9	58.4
	FITZ	813.7	254.3	5532.8	830.0	1666.9	1163.4	5674.4	694.5	7159.9	1262.0	11942.7	4187.6	3450.7	2114.1	571.1	63.9	109.8	62.8
	NMPE	497.7	137.6	3025.0	1588.6	1927.9	1454.3	4904.1	2705.1	4680.6	235.2	7888.0	711.1	2468.8	356.5	1163.7	308.3	523.5	281.3
	CONTOUR MEAN	1151.1	346.4	5988.7	1244.2	1454.5	297.7	6205.7	1248.9	5310.3	670.1	6858.2	2014.2	2773.3	391.1	896.0	193.9	289.7	89.4
20	NMPW	684.0	381.8	7045.6	1138.4	2778.9	801.1	8294.3	357.2	9791.4	222.1	2054.6	517.3	952.7	70.2	810.2	150.5	282.9	21.7
	NMPP	507.6	58.2	2787.2	381.5	3360.2	912.1	6976.8	1151.6	4320.6	341.5	3926.8	180.6	739.6	362.5	933.5	283.5	235.1	71.1
	FITZ	710.0	266.1	7182.6	1156.9	1363.2	965.8	4975.6	1798.0	5046.8	1605.3	7741.9	659.7	5143.3	1819.4	1612.9	876.7	112.7	64.1
	NMPE	706.3	398.2	5946.8	3342.6	1530.2	566.4	5232.3	2471.9	4533.4	303.0	4464.5	33.6	2105.9	706.6	727.2	154.3	510.6	10.6
	CONTOUR MEAN	652.0	48.5	5740.6	1022.6	2258.1	484.5	6369.8	780.5	5923.1	1298.4	4547.0	1183.6	2235.4	1014.7	1020.9	201.8	285.3	83.2
40	NMPW	362.3	115.9	6962.8	1810.0	2937.8	1283.3	6302.6	222.4	2905.2	234.8	3146.4	283.7	3002.4	18.5	573.0	147.5	225.8	37.5
	NMPP	657.6	143.4	4535.3	648.8	1792.9	726.2	8793.0	419.3	4865.8	325.9	1404.4	169.0	1149.2	172.2	508.3	35.5	299.9	49.2
	FITZ	649.8	177.8	4727.1	475.2	2111.5	832.5	6287.1	1643.5	3991.4	521.9	2964.6	942.2	5707.2	2494.0	801.3	46.6	277.6	60.9
	NMPE	593.4	165.4	895.2	18.1	871.9	305.0	5387.8	46.4	4847.2	103.0	3318.9	865.2	4740.7	1850.9	827.6	42.5	252.9	79.9
	CONTOUR MEAN	565.8	69.3	4280.1	1255.6	1916.4	425.4	6692.6	732.1	4152.4	463.1	2708.6	440.7	3649.9	1003.9	677.6	80.3	264.0	16.0
41#	NMPE-50%	593.4	165.4	895.2	18.1	605.6	477.4	6324.9	193.5	17368.8	11182.5	4199.0	326.9	1310.9	635.1	1515.3	11.7	185.8	122.9
	-25%	644.3	111.9	1452.1	371.9	NT	0.0	6577.5	2248.8	4726.5	423.3	5259.3	1265.7	9390.9	8695.6	640.9	102.0	205.8	191.6
	- 1%	918.0	341.5	5654.3	175.5	203.1	29.0	9479.1	2124.1	4409.6	1393.2	5391.1	3224.9	3738.6	294.3	1115.1	117.5	663.3	230.3
60	NMPW	1311.6	170.9	4124.4	709.2	621.8	228.8	7210.1	726.8	3901.5	673.2	6124.2	1182.1	1281.7	345.4	337.3	197.1	278.3	48.6
	NMPP	770.6	164.9	2549.6	1603.3	1178.6	91.3	7032.2	607.7	4727.1	373.8	3803.0	533.6	4475.0	597.1	750.2	56.1	205.4	17.8
	FITZ	514.4	38.6	5924.2	460.0	146.0	91.5	8510.5	3217.4	2760.9	31.7	2741.2	46.7	2764.3	500.4	682.5	206.8	192.6	50.8
	NMPE	578.3	60.1	1765.0	181.6	851.7	240.7	11729.2	1593.8	5132.5	504.8	9328.2	1297.8	6535.4	1361.7	1328.3	139.2	277.4	38.1
	CONTOUR MEAN	793.7	181.0	3590.8	919.6	699.5	217.0	8620.5	1087.4	4130.5	523.5	5499.2	1458.8	3764.1	1130.9	774.6	205.3	238.4	22.9
CONTROL MEAN**		854.0	203.6	4512.0	853.5	1645.1	308.4	6679.1	852.5	5141.9	718.1	4860.6	939.0	2861.9	668.6	882.6	124.8	334.4	41.1
EXP. MEAN**		727.3	77.1	5288.1	767.3	1525.3	347.0	7264.5	590.5	4616.2	442.5	4945.8	1198.8	3349.5	627.6	801.9	126.2	204.4	24.3
MONTHLY MEAN**		790.7	106.4	4900.0	563.3	1585.2	224.7	6971.8	506.5	4879.1	413.0	4903.2	735.5	3105.7	447.3	842.3	86.4	269.4	28.5
MONTHLY RANGE		362.3–2098.5		895.2–9065.9		146.0–3360.2		4378.1–11729.2		2760.9–9791.4		1404.4–11942.7		739.6–6535.4		337.3–1612.9		109.8–523.5	

*STANDARD ERROR
**MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
#40-FT SAMPLES COLLECTED AT VARIOUS LIGHT PENETRATION LEVELS
NT – SAMPLE NOT TAKEN, SUBMARINE PHOTOMETER MALFUNCTION

Table A-8

CHLOROPHYLL *a* CONCENTRATION (MICROGRAMS/LITER) IN WHOLE WATER DAY COLLECTIONS, NINE MILE POINT VICINITY, 1977

DEPTH CONTOUR	TRAN-SECT	26 APR		11 MAY††		16 JUN		15 JUL		12 AUG		16 SEP		13 OCT		8 NOV		14 DEC	
		MEAN	S.E.*	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.*	MEAN	S.E.	MEAN	S.E.
10	NMPW	3.65	0.61	13.22	0.00	6.61	0.76	8.71	0.10	9.66	0.15	1.73	1.63	4.15	0.10	1.50	0.06	1.52	0.16
	NMPP	5.09	1.73	12.22	0.00	8.69	0.60	8.56	0.35	4.81	0.00	2.30	2.20	3.69	1.05	1.96	0.08	1.36	0.16
	FITZ	6.89	2.89	10.01	0.00	11.21	0.56	8.26	0.25	5.91	0.30	13.58	7.09	5.87	0.18	2.26	0.02	0.84	0.04
	NMPE	6.17	0.72	6.81	0.00	6.89	0.40	6.46	0.75	5.61	0.10	5.93	0.32	3.07	1.79	3.58	0.18	1.24	0.44
	CONTOUR MEAN	5.45	0.71	10.57	1.42	8.35	1.06	8.00	0.52	6.50	1.08	5.89	2.73	4.20	0.60	2.33	0.45	1.24	0.15
20	NMPW	3.81	0.85	16.02	0.00	8.75	2.94	9.76	0.35	7.91	0.70	3.84	0.00	3.04	0.36	1.26	0.06	1.68	0.40
	NMPP	3.16	0.04	15.42	0.00	4.31	0.31	8.06	0.45	3.71	0.51	5.33	2.37	4.23	0.75	1.82	0.10	2.28	0.68
	FITZ	3.97	0.85	12.01	0.00	7.69	2.46	7.66	0.15	5.06	0.45	5.49	0.79	4.67	0.26	2.46	0.06	1.24	0.12
	NMPE	6.89	0.40	7.41	0.00	5.53	1.52	6.86	0.15	5.66	0.25	6.57	0.32	6.05	0.12	3.66	0.02	1.88	0.20
	CONTOUR MEAN	4.46	0.83	12.72	1.98	6.57	1.01	8.09	0.61	5.59	0.88	5.31	0.56	4.50	0.62	2.30	0.52	1.77	0.22
40	NMPW	5.93†	0.00	17.62	0.00	8.53	1.08	8.31	0.70	5.61	0.20	7.29	0.24	3.95	0.27	0.64	0.04	1.92	0.24
	NMPP	3.16	0.28	14.42	0.00	8.69	1.32	10.36	0.15	3.91	0.31	4.13	2.77	4.21	0.25	1.68	0.40	1.56	0.20
	FITZ	3.21	1.13	14.82	0.00	6.72	0.79	7.31	0.70	5.46	0.55	7.37	0.56	4.47	0.67	2.08	0.28	1.40	0.28
	NMPE	4.65	0.24	3.80	0.00	5.51	0.06	8.11	0.30	5.71	0.40	5.93	1.20	3.40	0.16	2.36	0.60	2.28	0.12
	CONTOUR MEAN	4.24	0.66	12.67	3.04	7.36	0.76	8.52	0.65	5.17	0.42	6.18	0.76	4.01	0.23	1.69	0.38	1.79	0.20
40	NMPE-50%	4.65	0.24	3.80	0.00	8.97	0.08	7.01	0.20	5.11	0.70	6.57	0.08	3.50	0.10	1.54	0.22	1.84	0.08
	-25%	4.73	0.64	4.45	0.00	NT	0.00	6.16	1.45	5.31	0.50	4.78	4.68	3.62	0.06	1.52	0.04	2.48	0.16
	- 1%	5.49	0.28	7.61	0.00	9.13	1.84	7.06	0.05	3.10	0.20	5.13	1.93	3.72	0.12	2.54	0.14	1.53	1.48
60	NMPW	6.29	3.25	5.81	0.00	9.17	2.60	10.01	0.50	5.36	0.55	3.41	0.69	4.31	0.91	1.20	0.08	1.36	0.80
	NMPP	1.65	1.55	15.82	0.00	11.29	0.72	9.36	0.15	4.91	0.40	3.49	1.89	3.91	0.23	1.48	0.12	1.40	0.44
	FITZ	5.69	1.44	11.81	0.00	5.15	0.06	9.56	0.15	5.31	0.10	6.85	1.08	4.31	0.26	2.00	0.04	1.52	0.56
	NMPE	4.97	0.88	3.56	0.00	5.95	1.30	8.56	0.55	4.21	0.71	6.25	0.24	2.84	0.04	2.72	0.08	1.72	0.12
	CONTOUR MEAN	4.65	1.04	9.25	2.80	7.89	1.43	9.37	0.30	4.95	0.27	5.00	0.90	3.84	0.35	1.85	0.33	1.50	0.08
CONTROL MEAN**		5.30	0.43	9.28	1.96	7.12	0.53	8.35	0.44	6.22	0.61	5.12	0.67	3.85	0.37	2.12	0.40	1.70	0.12
EXP. MEAN**		4.10	0.60	13.32	0.74	7.97	0.90	8.64	0.37	4.89	0.26	6.07	1.23	4.42	0.23	1.97	0.11	1.45	0.14
MONTHLY MEAN**		4.70	0.39	11.30	1.14	7.54	0.52	8.49	0.28	5.55	0.36	5.59	0.69	4.14	0.22	2.04	0.20	1.58	0.09
MONTHLY RANGE		1.65–6.89		3.56–17.62		4.31–11.29		6.86–10.36		3.71–9.66		1.73–13.58		2.84–6.05		0.64–3.66		0.84–2.28	

*STANDARD ERROR
**MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
†REPLICATE 1 MISSING
††REPLICATES WERE COMPOSITED DURING FIELD FILTRATION
NT-SAMPLES NOT TAKEN, SUBMARINE PHOTOMETER MALFUNCTION

Table A-9

PHAEOPHYTIN *a* CONCENTRATION (MICROGRAMS/LITER) IN WHOLE WATER DAY COLLECTIONS, NINE MILE POINT VICINITY, 1977

DEPTH CONTOUR	TRAN-SECT	26 APR MEAN	26 APR S.E.*	11 MAY†† MEAN	11 MAY†† S.E.	16 JUN MEAN	16 JUN S.E.	15 JUL MEAN	15 JUL S.E.	12 AUG MEAN	12 AUG S.E.	16 SEP MEAN	16 SEP S.E.	13 OCT MEAN	13 OCT S.E.*	8 NOV MEAN	8 NOV S.E.	14 DEC MEAN	14 DEC S.E.
10	NMPW	<0.10	0.00	1.08	0.00	2.16	0.23	3.06	0.32	0.61	0.03	3.55	2.71	1.13	0.07	0.46	0.14	0.18	0.08
	NMPP	0.25	0.15	<0.10	0.00	1.00	0.23	2.23	0.14	<0.10	0.00	2.32	2.22	1.14	0.67	0.85	0.17	0.72	0.24
	FITZ	0.71	0.61	1.48	0.00	2.02	1.19	2.25	0.60	<0.10	0.00	0.48	0.38	2.14	0.06	0.99	0.04	0.40	0.02
	NMPE	0.87	0.19	<0.10	0.00	1.98	0.26	1.46	0.40	0.14	0.04	2.76	1.89	0.95	0.72	1.41	0.13	1.51	1.17
	CONTOUR MEAN	0.48	0.18	0.69	0.35	1.79	0.27	2.25	0.33	0.24	0.12	2.28	0.65	1.34	0.27	0.93	0.20	0.70	0.29
20	NMPW	<0.10	0.00	3.04	0.00	1.73	1.21	1.52	0.14	<0.10	0.00	<0.10	0.00	0.80	0.06	0.55	0.01	0.37	0.04
	NMPP	0.79	0.21	1.96	0.00	1.83	0.37	2.84	0.14	0.38	0.28	0.70	0.60	1.51	0.03	0.56	0.10	0.12	0.02
	FITZ	0.57	0.47	1.16	0.00	3.13	0.75	1.91	0.24	<0.10	0.00	0.18	0.08	1.52	0.01	0.69	0.05	0.28	0.18
	NMPE	0.88	0.21	<0.10	0.00	2.68	0.40	1.73	0.10	<0.10	0.00	0.29	0.19	1.83	0.22	0.74	0.14	0.45	0.12
	CONTOUR MEAN	0.59	0.17	1.57	0.62	2.34	0.34	2.00	0.29	0.17	0.07	0.32	0.13	1.42	0.22	0.64	0.05	0.31	0.07
40	NMPW	<0.10†	0.00	<0.10	0.00	2.24	0.15	2.24	0.11	0.29	0.19	<0.10	0.00	1.12	0.32	0.44	0.03	0.41	0.13
	NMPP	0.35	0.25	1.70	0.00	1.95	0.19	2.29	0.40	<0.10	0.00	1.78	1.68	0.86	0.14	0.50	0.02	0.32	0.12
	FITZ	0.72	0.62	0.32	0.00	2.52	0.17	0.68	0.28	<0.10	0.00	<0.10	0.00	1.28	0.46	0.50	0.06	0.87	0.14
	NMPE	2.20	0.25	0.65	0.00	2.18	0.26	1.18	0.02	<0.10	0.00	0.58	0.48	0.96	0.05	0.90	0.11	0.24	0.16
	CONTOUR MEAN	0.84	0.47	0.69	0.35	2.22	0.12	1.60	0.40	0.15	0.05	0.64	0.40	1.06	0.09	0.59	0.11	0.46	0.14
40	NMPE-50%	2.20	0.25	0.65	0.00	1.07	0.32	1.19	0.27	0.16	0.06	<0.10	0.00	0.97	0.14	0.49	0.12	0.32	0.01
	-25%	1.53	0.90	0.68	0.00	NT	0.00	0.80	0.70	<0.10	0.00	2.96	2.86	1.03	0.02	0.40	0.00	0.55	0.05
	- 1%	1.81	0.06	3.32	0.00	2.36	0.34	0.97	0.16	<0.10	0.00	1.03	0.93	1.00	0.17	0.56	0.19	1.54	1.44
60	NMPW	<0.10	0.00	11.15	0.00	1.07	0.04	1.94	0.47	<0.10	0.00	1.00	0.88	1.26	0.43	0.38	0.02	0.77	0.52
	NMPP	5.36	4.81	0.44	0.00	1.04	0.17	2.24	0.68	<0.10	0.00	3.12	3.02	0.99	0.10	0.51	0.12	0.70	0.30
	FITZ	<0.10	0.00	1.64	0.00	0.85	0.18	1.16	0.34	<0.10	0.00	0.17	0.07	1.47	0.10	0.58	0.07	0.27	0.17
	NMPE	0.51	0.41	0.72	0.00	2.78	0.39	1.64	0.87	0.40	0.30	<0.10	0.00	0.62	0.08	0.66	0.02	0.69	0.01
	CONTOUR MEAN	1.52	1.28	3.49	2.57	1.44	0.45	1.75	0.23	0.18	0.07	1.10	0.70	1.09	0.18	0.53	0.06	0.61	0.11
CONTROL MEAN**		0.61	0.26	2.12	1.34	2.10	0.61	1.85	0.21	0.23	0.07	1.06	0.48	1.08	0.13	0.69	0.12	0.58	0.15
EXP. MEAN**		1.11	0.61	1.10	0.25	1.79	0.40	1.95	0.25	0.14	0.04	1.11	0.41	1.36	0.14	0.65	0.06	0.46	0.09
MONTHLY MEAN**		0.86	0.33	1.61	0.67	1.95	0.17	1.90	0.16	0.18	0.04	1.08	0.30	1.22	0.10	0.67	0.07	0.52	0.09
MONTHLY RANGE		<0.10–5.36		<0.10–11.15		0.85–3.13		0.68–3.06		<0.10–0.61		<0.10–3.55		0.80–2.14		0.38–1.41		0.12–1.51	

*STANDARD ERROR
**MEANS ARE FOR SURFACE SAMPLES ONLY; CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
†REPLICATE 1 MISSING
††REPLICATES WERE COMPOSITED DURING FIELD FILTRATION
NT-SAMPLES NOT TAKEN, SUBMARINE PHOTOMETER MALFUNCTION

Table A-10

PRIMARY PRODUCTION (mg C/m^3/4-Hr) AFTER 4-HR INCUBATION PERIOD, NINE MILE POINT VICINITY, 1977

DEPTH CONTOUR (FT)	TRANSECT	3 MAY MEAN	3 MAY S.E.*	13 MAY MEAN	13 MAY S.E.	16 JUN MEAN	16 JUN S.E.	15 JUL MEAN	15 JUL S.E.	12 AUG MEAN	12 AUG S.E.	16 SEP MEAN	16 SEP S.E.	13 OCT MEAN	13 OCT S.E.*	8 NOV MEAN	8 NOV S.E.	14 DEC MEAN	14 DEC S.E.
10	NMPW	17.33	2.07	64.45	4.76	5.03	2.15	6.61	0.90	1.72	1.48	3.45	0.88	17.17	10.08	3.22	0.27	1.07	0.36
	NMPP	35.24	3.19	113.32	56.23	5.30	3.47	4.09	0.93	4.99	2.36	8.86	2.89	6.15	3.17	2.16	0.52	9.12	2.92
	FITZ	14.69	8.12	35.72	4.51	18.90	3.91	3.11	1.88	6.04	1.50	18.97	4.22	12.87	1.12	5.04	1.19	8.35	2.25
	NMPE	51.67	1.32	27.40	26.54	11.81	0.67	1.42	0.17	5.54	1.10	39.45	13.68	14.83	6.84	9.75	1.10	4.17	0.98
	CONTOUR MEAN	29.73	8.62	60.22	19.40	10.26	3.28	3.81	1.08	4.57	0.97	17.68	7.94	12.76	2.37	5.04	1.68	5.68	1.88
20	NMPW	43.33	8.31	52.58	1.94	35.35	4.57	7.53	0.13	3.76	3.26	2.23	1.36	8.16	2.44	2.47	0.08	3.36	1.10
	NMPP	17.45	17.45	4.97	2.27	17.37	5.62	6.45	0.42	6.25	3.19	9.57	0.34	4.55	0.05	2.87	0.73	7.44	0.03
	FITZ	12.27	7.56	44.90	33.82	9.92	1.70	1.60	1.41	3.25	0.67	6.05	3.66	13.17	1.90	5.33	0.74	5.88	0.23
	NMPE	26.59	6.36	22.93	7.99	10.82	0.15	1.08	0.67	7.70	3.40	31.31	5.80	5.27	3.43	7.71	0.62	3.91	0.56
	CONTOUR MEAN	24.91	6.82	31.35	10.81	18.37	5.90	4.17	1.65	5.24	1.05	12.29	6.51	7.79	1.96	4.60	1.22	5.15	0.94
40	NMPW	11.96	11.37	7.68	3.93	39.45	6.34	4.51	1.00	5.63	1.54	3.27	3.25	9.83	2.26	0.44	0.44	1.41	0.06
	NMPP	35.06	7.22	16.16	1.07	62.85	14.24	1.75	1.52	9.03	1.26	7.51	2.35	6.21	3.50	5.38	0.29	9.78	1.45
	FITZ	14.15†	2.00	25.83	2.75	12.17	0.90	1.37	0.08	4.27	1.25	21.84	1.84	4.79	0.94	4.06	1.27	3.12	0.85
	NMPE	7.33†	7.33	8.64	4.96	6.49	2.87	1.29	0.68	12.97	3.25	38.09	9.38	20.41	17.33	11.36	4.24	11.72	2.81
	CONTOUR MEAN	17.13	6.15	14.58	4.20	30.24	13.03	2.23	0.77	7.98	1.94	17.68	7.88	10.31	3.53	5.31	2.27	6.51	2.51
40	NMPE-50%	7.33	7.33	8.64	4.96	8.22	7.46	6.15	1.55	8.50	0.42	20.30	3.88	23.75	5.67	19.31	3.98	11.94	3.74
	-25%	13.58	1.36	7.50	1.23	NT	0.00	1.39	1.04	15.83	1.21	8.47	4.34	16.94	3.92	6.45	0.81	2.15	0.00
	- 1%	6.96	1.97	27.52	14.75	7.83	2.07	1.85	0.52	6.98	0.84	14.18	6.98	18.17	13.54	8.24	1.02	4.96	2.30
60	NMPW	3.42	1.91	46.26	21.94	5.79	1.32	11.28	2.28	5.05	0.70	7.99	3.18	35.29	34.83	4.73	4.16	3.29	2.59
	NMPP	0.95	0.34	26.32	11.31	9.68	4.49	2.60	2.25	3.83	0.79	6.90	2.54	11.19	8.18	0.97	0.74	5.39	3.01
	FITZ	7.91	2.05	29.71	4.56	10.73	0.96	0.68	0.56	5.56	0.30	15.54	3.54	2.48	1.82	3.60	1.00	8.96	3.12
	NMPE	2.26	0.11	12.44	5.99	15.16	1.13	1.83	1.49	6.74	2.51	6.51	3.51	0.22	0.00	5.49	0.47	10.43	1.83
	CONTOUR MEAN	3.64	1.51	28.68	6.95	10.34	1.93	4.10	2.43	5.30	0.60	9.24	2.12	12.30	8.02	3.70	0.99	7.02	1.63
CONTROL MEAN**		20.49	6.56	30.30	7.65	16.24	4.79	4.44	1.32	6.14	1.17	16.54	5.88	13.90	3.83	5.65	1.32	4.92	1.40
EXP. MEAN**		17.22	4.30	37.12	11.68	18.37	6.54	2.71	0.66	5.40	0.64	11.91	2.14	7.68	1.46	3.68	0.57	7.26	0.81
MONTHLY MEAN**		18.85	3.81	33.71	6.80	17.30	3.92	3.58	0.75	5.77	0.65	14.22	3.08	10.79	2.14	4.66	0.74	6.09	0.84
MONTHLY RANGE		0.95–51.67		4.97–113.32		5.03–62.85		0.68–11.28		1.72–12.97		2.23–39.45		0.22–35.29		0.44–11.36		1.07–11.72	

*STANDARD ERROR
**MEANS ARE FOR SURFACE SMAPLES ONLY; CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
†REPLICATE 1 MISSING
NT-SAMPLE NOT-TAKEN, SUBMARINE PHOTOMETER MALFUNCTION

APPENDIX B

ZOOPLANKTON

Table B-1

PERCENT RELATIVE ABUNDANCE OF MICROZOOPLANKTERS FROM WISCONSIN NET (76 MICRON) OBLIQUE TOWS, NINE MILE POINT VICINITY, 1977

Taxa	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
Protozoa										
Mastigophora	T*									T
Ciliophora	1	1	T	T		T	T	T		T
Suctoria	T	T	T						T	T
Unid. Protozoa	T	T	T	T	T	T	1	1	1	T
Rotifera										
Brachionidae										
Keratella sp.	7	20	66	13	22	27	22	13	25	38
Brachionus sp.	T	4	T	T	1	2	1		T	1
Kellicottia sp.	8	1	3	5	6	T	1	1	6	4
Notholca sp.	4	2	T	T	T		T	T	T	1
Lecane sp.			T	T	T				T	T
Lepadella sp.					T		T			T
Monostyla sp.	T		T	T	T	T				T
Conochilidae										
Conochilus sp.			T	1		1	1	1	1	T
Filinidae										
Filinia sp.	T	1			T	T			T	T
Asplanchidae										
Asplanchna sp.	1	T	1	1		1	T		1	1
Synchaetidae										
Polyarthra sp.	3	3	2	6	7	28	10	13	11	6
Synchaeta sp.		1	2	1	T	T	T	T	T	1
Trichoceridae										
Trichocerca sp.				3	1	2	T			1
Ploesomatidae										
Ploesoma sp.		T	T	17	T	4	T			5
Unid. Rotifers	27	59	10	24	1	3	11	10	2	18
Cladocera										
Bosminidae	1	T	5	13	1	4	5	2	6	6
Chydoridae										
Alona sp.										
Chydorus sphaericus				T	T					T
Chydorus sp.		T	T	1		T				T
Daphnidae										
Daphnia retrocurva		T	T	T	8	5	T	3		1
Daphnia sp.	T			T	1	1	3	7	3	T
Ceriodaphnia sp.						T	T			T
Leptodoridae										
Leptodora kindtii					2	T	T	1		T
Sididae										
Diaphanosoma sp.					T	T	T	T		T
Ostracoda							T			T
Copepoda										
Calanoida										
Diaptomus oregonensis	T								1	T
Diaptomus sicilis	1									T
Diaptomus minutus	T									T
Diaptomus sp.					T	T	T	11	T	T
Eurytemora affinis						T		T	T	T
Limnocalanus macrurus	T									T
Unid. Copepodids	5	T			1	3	13	7		1
Unid. Calanoida	T		T	T			T		2	T
Cyclopoida										
Cyclops bicuspidatus thomasi	7	T	T	1	4	1	1	4	3	1
Cyclops vernalis						T				T
Cyclops sp.					T				T	T
Mesocyclops sp.						T				T
Tropocyclops prasinus mexicana			T		T					T
Tropocyclops sp.					T	T	T	T	T	T
Unid. Copepodids	19	1	1	7	33	9	18	13		7
Unid. Cyclopoida	T						T		19	T
Unid. Harpacticoida							T		T	T
Unid. Copepoda (nauplii)	16	7	8	9	14	9	13	13	21	8
Diptera										
Chironomidae (larvae)				T						T
Total Density (No./m)	6,638	61,064	228,047	137,788	39,260	27,980	12,916	9,938	15,013	59,849
No. Taxa	25	20	23	25	28	30	30	21	25	47

*T = less than 0.5 percent

TABLE B-2

ABUNDANCE (NO./CUBIC METER) OF MICROZOOPLANKTON FROM WISCONSIN NET (76 MICRON) OBLIQUE TOWS NINE MILE POINT VICINITY, 1977

ROTIFERA

DEPTH CONTOUR	TRANSECT	APR MEAN	APR S.E.*	MAY MEAN	MAY S.E.	JUN MEAN	JUN S.E.	JUL MEAN	JUL S.E.	AUG MEAN	AUG S.E.	SEP MEAN	SEP S.E.
10	NMPW	2372.	354.	55967.	1102.	465608.	21163.	110847.	272.	18127.	1564.	8100.	1958.
	NMPP	1927.	37.	91560.	967.	273579.	22062.	135186.	10080.	19665.	1582.	7274.	48.
	FITZ	2625.	305.	72698.	953.	250729.	18788.	215336.	1755.	17084.	910.	21468.	1368.
	NMPE	5830.	136.	68705.	4785.	243420.	9738.	118239.	6567.	19362.	472.	18237.	2432.
CONTOUR MEAN		3183.	892.	77232.	8214.	308334.	52817.	144902.	24024.	18560.	594.	13770.	3577.
20	NMPW	2530.	239.	77028.	1674.	178648.	1997.	103682.	1150.	15858.	620.	12500.	1488.
	NMPP	2308.	280.	73456.	1276.	298136.	2763.	127985.	1910.	9411.	241.	23012.	211.
	FITZ	2930.	51.	51673.	5546.	266249.	15989.	75226.	2893.	12097.	547.	21137.	534.
	NMPE	5352.	885.	70330.	2930.	89947.	8818.	114549.	6417.	6250.	1607.	29262.	690.
CONTOUR MEAN		3280.	702.	68122.	5651.	208245.	46829.	105335.	11208.	10904.	2038.	21478.	3460.
40	NMPW	2005.	150.	53004.	2804.	179934.	15631.	123909.	16405.	20571.	87.	25178.	237.
	NMPP	1958.	218.	47205.	226.	181021.	12196.	110689.	657.	13744.	609.	13028.	365.
	FITZ	1965.	117.	38399.	2580.	136209.	8683.	52941.	45.	13454.	2586.	31604.	2022.
	NMPE	3495.	192.	28960.	972.	122991.	2044.	86799.	4243.	12634.	2915.	23951.	1697.
CONTOUR MEAN		2356.	380.	41892.	5253.	155039.	14934.	93585.	15573.	15101.	1838.	23440.	3855.
60	NMPW	2466.	298.	40566.	3473.	133552.	8211.	55126.	2241.	17532.	505.	27321.	1924.
	NMPP	2079.	18.	47378.	2773.	158461.	8340.	35685.	2763.	7437.	1214.	16292.	1677.
	FITZ	5312.	531.	28227.	76.	111726.	3688.	42980.	569.	8319.	402.	13240.	697.
	NMPE	7529.	366.	28023.	68.	37696.	338.	37383.	516.	16099.	169.	10993.	1570.
CONTOUR MEAN		4347.	1283.	36048.	4761.	110359.	26034.	42793.	4396.	12347.	2603.	16962.	3620.
CONTROL MEAN**		3947.	720.	55323.	7877.	181474.	46165.	93804.	11219.	15804.	1610.	19443.	2970.
EXP. MEAN**		2638.	403.	56325.	7439.	209513.	25082.	99503.	21402.	12652.	1509.	18382.	2660.
MONTHLY MEAN		3293.	433.	55824.	5235.	195494.	25635.	96654.	11696.	14228.	1141.	18912.	1895.
MONTHLY RANGE		1927.-	7529.	28023.-	91560.	37696.-	465608.	35685.-	215336.	6250.-	20571.	7274.-	31604.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

Table B-2 (CONTD)

ABUNDANCE (NO./CUBIC METER) OF MICROZOOPLANKTON FROM
WISCONSIN NET (76 MICRON) OBLIQUE TOWS
NINE MILE POINT VICINITY, 1977

ROTIFERA

DEPTH CONTOUR	TRAN-SECT	OCT MEAN	OCT S.E.*	NOV MEAN	NOV S.E.	DEC MEAN	DEC S.E.
10	NMPW	6142.	78.	7404.	1235.	4308.	142.
	NMPP	3571.	198.	1131.	31.	4188.	292.
	FITZ	7945.	125.	7614.	124.	9123.	2024.
	NMPE	12310.	559.	14939.	467.	7717.	1092.
CONTOUR MEAN		7492.	1840.	7772.	2823.	6334.	1238.
20	NMPW	6215.	492.	3533.	324.	3970.	234.
	NMPP	3721.	60.	8202.	272.	6651.	1021.
	FITZ	5035.	261.	6376.	257.	4694.	873.
	NMPE	7577.	164.	8421.	164.	8643.	160.
CONTOUR MEAN		5637.	823.	6633.	1130.	5989.	1050.
40	NMPW	5157.	206.	748.	228.	8005.	15.
	NMPP	7440.	1131.	3161.	146.	6813.	424.
	FITZ	6415.	532.	4164.	75.	5411.	451.
	NMPE	7672.	399.	2866.	55.	8385.	89.
CONTOUR MEAN		6671.	574.	2735.	718.	7153.	671.
60	NMPW	4811.	55.	4119.	450.	8022.	593.
	NMPP	3817.	214.	4422.	680.	6290.	620.
	FITZ	4793.	307.	3392.	362.	8717.	6.
	NMPE	5041.	358.	2575.	182.	8454.	102.
CONTOUR MEAN		4616.	272.	3627.	412.	7871.	546.
CONTROL MEAN**		6866.	868.	5576.	1609.	7188.	674.
EXP. MEAN**		5342.	610.	4808.	852.	6486.	623.
MONTHLY MEAN		6104.	549.	5192.	865.	6837.	453.
MONTHLY RANGE		3571.-	12310.	748.-	14939.	3970.-	9123.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

Table B-3

ABUNDANCE (NO./CUBIC METER) OF MICROZOOPLANKTON FROM
WISCONSIN NET (76 MICRON) OBLIQUE TOWS
NINE MILE POINT VICINITY, 1977

COPEPODA NAUPLII

DEPTH CONTOUR	TRAN-SECT	APR MEAN	APR S.E.*	MAY MEAN	MAY S.E.	JUN MEAN	JUN S.E.	JUL MEAN	JUL S.E.	AUG MEAN	AUG S.E.	SEP MEAN	SEP S.E
10	NMPW	1306.	217.	5160.	1214.	16461.	9406.	6051.	1650.	5813.	92.	1489.	312.
	NMPP	832.	70.	2633.	1239.	27211.	6619.	8894.	1779.	5515.	995.	503.	120.
	FITZ	763.	336.	2698.	794.	18783.	648.	11555.	350.	5134.	498.	1631.	53.
	NMPE	1356.	136.	4233.	1656.	29819.	6694.	10383.	2132.	2125.	236.	1064.	152.
CONTOUR MEAN		1064.	155.	3681.	616.	23070.	3224.	9221.	1189.	4597.	830.	1167.	251.
20	NMPW	859.	191.	4744.	0.	35637.	6605.	6330.	575.	3987.	266.	5506.	149.
	NMPP	593.	54.	5650.	911.	20244.	2761.	7641.	0.	2847.	241.	3167.	493.
	FITZ	556.	101.	4552.	268.	22593.	1043.	13321.	1969.	3587.	304.	1506.	49.
	NMPE	1686.	84.	4721.	1140.	10141.	1764.	16352.	527.	2679.	179.	2001.	69.
CONTOUR MEAN		923.	263.	4917.	248.	22154.	5244.	10911.	2364.	3275.	309.	3045.	891.
40	NMPW	802.	0.	3872.	401.	12723.	1090.	12216.	1745.	4377.	350.	5880.	0.
	NMPP	532.	193.	3162.	903.	20486.	8976.	8359.	2280.	5010.	135.	1860.	453.
	FITZ	734.	169.	4060.	190.	10853.	2713.	14874.	252.	5633.	1840.	2128.	638.
	NMPE	1498.	115.	2721.	130.	14023.	1169.	24690.	1543.	9475.	729.	3206.	189.
CONTOUR MEAN		906.	207.	3454.	311.	14521.	2092.	15035.	3485.	6124.	1146.	3219.	871.
60	NMPW	893.	255.	4153.	573.	13957.	1916.	10756.	448.	3319.	0.	6301.	240.
	NMPP	728.	18.	3737.	1085.	18832.	1614.	7937.	529.	4098.	152.	2995.	3.
	FITZ	1707.	493.	3519.	918.	9979.	2169.	15526.	757.	4532.	57.	1347.	46.
	NMPE	1669.	41.	4111.	411.	4586.	783.	12257.	1656.	17624.	1356.	1317.	0.
CONTOUR MEAN		1249.	256.	3880.	152.	11839.	3020.	11619.	1580.	7393.	3410.	2990.	1171.
CONTROL MEAN**		1258.	128.	4214.	260.	17168.	3658.	12379.	2116.	6150.	1828.	3318.	774.
EXP. MEAN**		913.	134.	3751.	356.	18623.	2030.	11013.	1144.	4545.	346.	1592.	309.
MONTHLY MEAN		1036.	106.	3983.	221.	17896.	2030.	11686.	1175.	5347.	922.	2605.	443.
MONTHLY RANGE		532.-	1707.	2633.-	5650.	4586.-	35637.	6051.-	24690.	2125.-	17624.	503.-	6301.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

Table B-3 (CONTD)

ABUNDANCE (NO./CUBIC METER) OF MICROZOOPLANKTON FROM
WISCONSIN NET (76 MICRON) OBLIQUE TOWS
NINE MILE POINT VICINITY, 1977

COPEPODA NAUPLII

DEPTH CONTOUR	TRAN-SECT	OCT MEAN	OCT S.E.*	NOV MEAN	NOV S.E.	DEC MEAN	DEC S.E.
10	NMPW	2371.	428.	725.	118.	1157.	160.
	NMPP	562.	132.	131.	33.	2212.	328.
	FITZ	702.	50.	427.	69.	2932.	243.
	NMPE	303.	161.	560.	187.	1882.	151.
CONTOUR MEAN		985.	470.	461.	126.	2046.	309.
20	NMPW	2593.	715.	422.	28.	1346.	82.
	NMPP	825.	75.	605.	61.	3450.	42.
	FITZ	906.	70.	1076.	10.	2265.	27.
	NMPE	446.	117.	1509.	264.	2301.	320.
CONTOUR MEAN		1193.	478.	903.	244.	2465.	445.
40	NMPW	2806.	289.	260.	71.	3231.	224.
	NMPP	3512.	536.	729.	97.	4240.	354.
	FITZ	1737.	392.	773.	75.	4026.	97.
	NMPE	1568.	380.	758.	92.	4195.	131.
CONTOUR MEAN		2405.	459.	630.	124.	3923.	235.
60	NMPW	1899.	129.	1188.	7.	4861.	672.
	NMPP	2230.	162.	1506.	49.	4031.	399.
	FITZ	1321.	338.	854.	180.	4036.	699.
	NMPE	2551.	384.	1120.	258.	3671.	407.
CONTOUR MEAN		2000.	263.	1167.	134.	4199.	224.
CONTROL MEAN**		1817.	345.	818.	150.	2918.	483.
EXP. MEAN**		1474.	353.	763.	146.	3399.	293.
MONTHLY MEAN		1646.	243.	790.	101.	3158.	280.
MONTHLY RANGE		303.-	3512.	131.-	1509.	1157.-	4861.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

Table B-4

ABUNDANCE (NO./CUBIC METER) OF MICROZOOPLANKTON FROM
WISCONSIN NET (76 MICRON) OBLIQUE TOWS
NINE MILE POINT VICINITY, 1977

COPEPODA-CYCLOPOIDA

		APR		MAY		JUN		JUL		AUG		SEP	
DEPTH CONTOUR	TRAN-SECT	MEAN	S.E.*	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E
10	NMPW	801.	22.	0.	0.	7055.	7055.	825.	275.	6901.	1196.	3694.	134.
	NMPP	586.	59.	0.	0.	735.	735.	2068.	296.	4687.	15.	215.	24.
	FITZ	2106.	763.	159.	159.	1944.	648.	7003.	2801.	2404.	69.	1421.	474.
	NMPE	2372.	407.	368.	0.	3043.	609.	25958.	1891.	6061.	708.	355.	152.
CONTOUR MEAN		1465.	452.	132.	87.	3194.	1370.	9114.	5762.	5013.	982.	1421.	804.
20	NMPW	525.	95.	140.	140.	1843.	307.	288.	288.	6645.	443.	8482.	149.
	NMPP	717.	137.	547.	182.	1840.	920.	2183.	1092.	4102.	434.	244.	231.
	FITZ	935.	126.	153.	153.	2781.	2.	14888.	784.	5836.	365.	1215.	145.
	NMPE	2528.	3.	163.	163.	2425.	1102.	18168.	586.	21964.	714.	759.	345.
CONTOUR MEAN		1176.	458.	251.	99.	2222.	231.	8882.	4482.	9637.	4143.	2925.	1288.
40	NMPW	852.	201.	401.	401.	2545.	2545.	6283.	698.	12955.	350.	5782.	335.
	NMPP	580.	48.	452.	0.	5550.	2124.	5522.	557.	6093.	135.	2976.	54.
	FITZ	1090.	195.	228.	228.	3799.	3256.	17395.	4286.	9176.	2307.	2235.	106.
	NMPE	6260.	115.	777.	130.	3798.	676.	19289.	1543.	57175.	6965.	3112.	1226.
CONTOUR MEAN		2133.	1359.	464.	115.	3923.	618.	12122.	3615.	21350.	12024.	3521.	771.
60	NMPW	978.	85.	215.	215.	3831.	547.	8515.	448.	11039.	938.	4305.	1275.
	NMPP	1421.	71.	723.	482.	5112.	1883.	12111.	118.	20034.	455.	4133.	419.
	FITZ	1935.	341.	612.	306.	5641.	0.	15526.	757.	10901.	574.	1533.	511.
	NMPE	4192.	41.	411.	137.	1678.	336.	10667.	464.	45924.	2203.	2533.	507.
CONTOUR MEAN		2132.	714.	430.	112.	4065.	882.	11705.	1472.	21975.	8264.	3126.	664.
CONTROL MEAN**		2314.	714.	309.	84.	3277.	609.	11249.	3246.	21083.	6973.	3625.	935.
EXP. MEAN**		1170.	211.	359.	92.	3425.	665.	9662.	2140.	7904.	1984.	1822.	443.
MONTHLY MEAN		1742.	389.	334.	60.	3351.	436.	10456.	1889.	14494.	3393.	2723.	551.
MONTHLY RANGE		525.-	6260.	0.-	777.	735.-	7055.	289.-	25958.	2404.-	57175.	215.-	8482.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

Table B-4 (CONTD)

ABUNDANCE (NO./CUBIC METER) OF MICROZOOPLANKTON FROM
WISCONSIN NET (76 MICRON) OBLIQUE TOWS
NINE MILE POINT VICINITY, 1977

COPEPODA-CYCLOPOIDA

DEPTH CONTOUR	TRAN-SECT	OCT MEAN	OCT S.E.*	NOV MEAN	NOV S.E.	DEC MEAN	DEC S.E.
10	NMPW	3771.	583.	855.	55.	427.	107.
	NMPP	893.	132.	229.	57.	1712.	86.
	FITZ	551.	100.	1076.	35.	3373.	154.
	NMPE	313.	114.	2521.	373.	3840.	151.
CONTOUR MEAN		1382.	805.	1170.	485.	2338.	784.
20	NMPW	5679.	134.	844.	28.	824.	55.
	NMPP	645.	255.	1604.	151.	2772.	402.
	FITZ	840.	247.	1387.	449.	2456.	273.
	NMPE	774.	117.	3078.	264.	2681.	40.
CONTOUR MEAN		1984.	1232.	1728.	477.	2183.	458.
40	NMPW	4098.	96.	630.	126.	2965.	112.
	NMPP	6429.	0.	1556.	340.	3486.	400.
	FITZ	1849.	392.	1920.	125.	4477.	161.
	NMPE	2635.	705.	1479.	296.	2425.	478.
CONTOUR MEAN		3753.	1006.	1396.	273.	3338.	437.
60	NMPW	1899.	55.	1262.	144.	5216.	158.
	NMPP	3706.	281.	2357.	316.	4784.	266.
	FITZ	2120.	92.	1325.	202.	4627.	430.
	NMPE	2997.	201.	1603.	120.	5246.	1070.
CONTOUR MEAN		2680.	416.	1637.	251.	4968.	155.
CONTROL MEAN**		2771.	628.	1534.	305.	2953.	633.
EXP. MEAN**		2129.	719.	1432.	221.	3461.	394.
MONTHLY MEAN		2450.	468.	1483.	182.	3207.	366.
MONTHLY RANGE		313.-	6429.	229.-	3078.	427.-	5246.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

Table B-5

ABUNDANCE (NO./CUBIC METER) OF MICROZOOPLANKTON FROM WISCONSIN NET (76 MICRON) OBLIQUE TOWS NINE MILE POINT VICINITY, 1977

CLADOCERA

DEPTH CONTOUR	TRAN-SECT	APR MEAN	APR S.E.*	MAY MEAN	MAY S.E.	JUN MEAN	JUN S.E.	JUL MEAN	JUL S.E.	AUG MEAN	AUG S.E.	SEP MEAN	SEP S.E
10	NMPW	0.	0.	0.	0.	27043.	1176.	2751.	550.	6441.	552.	3560.	356.
	NMPP	11.	11.	0.	C.	10296.	2942.	6301.	1186.	2381.	271.	455.	24.
	FITZ	0.	0.	0.	0.	10366.	7.	16457.	1050.	1648.	0.	1473.	105.
	NMPE	136.	68.	184.	184.	20691.	2434.	52639.	4160.	5746.	79.	1013.	0.
CONTOUR	MEAN	37.	33.	46.	46.	17099.	4117.	20037.	11226.	4054.	1195.	1625.	678.
20	NMPW	24.	24.	419.	140.	17051.	153.	7769.	288.	10188.	266.	2455.	372.
	NMPP	10.	10.	182.	182.	9662.	2300.	9005.	1364.	4344.	393.	2393.	704.
	FITZ	25.	25.	153.	153.	23288.	347.	20856.	241.	2796.	508.	3256.	535.
	NMPE	42.	42.	326.	326.	8157.	220.	34403.	2520.	6607.	714.	2277.	69.
CONTOUR	MEAN	25.	7.	270.	62.	14539.	3504.	18008.	6210.	5984.	1605.	2595.	223.
30	NMPW	25.	25.	401.	401.	5089.	727.	18499.	5236.	5427.	350.	1815.	710.
	NMPP	0.	0.	452.	226.	3905.	1850.	14438.	456.	5958.	948.	2557.	609.
	FITZ	65.	39.	228.	228.	5698.	1357.	19160.	3529.	2728.	370.	8939.	1915.
	NMPE	77.	0.	194.	194.	8160.	3506.	34334.	5015.	6965.	810.	6506.	1037.
CONTOUR	MEAN	42.	18.	319.	63.	5718.	901.	21608.	4369.	5270.	905.	4954.	1680.
40	NMPW	0.	0.	358.	72.	7663.	3264.	18151.	672.	2958.	361.	1604.	72.
	NMPP	38.	0.	0.	0.	4036.	269.	14540.	1137.	3111.	683.	1737.	419.
	FITZ	152.	0.	76.	76.	5207.	868.	15526.	379.	3442.	688.	2648.	232.
	NMPE	163.	163.	137.	0.	3244.	336.	9325.	1110.	7287.	1186.	3647.	3.
CONTOUR	MEAN	88.	41.	143.	77.	5037.	964.	14386.	1851.	4200.	1034.	2459.	447.
60	NMPW												
	NMPP												
	FITZ	58.	22.	252.	52.	12140.	2987.	22234.	5984.	6452.	716.	2885.	605.
	NMPE	37.	18.	136.	55.	9057.	2252.	14705.	1552.	3301.	470.	2932.	910.
		48.	14.	194.	29.	10598.	1850.	18510.	3137.	4877.	580.	2908.	528.
CONTOUR	MEAN	0.-	163.	0.-	452.	3244.-	27043.	2751.-	52639.	1648.-	10188.	455.-	8939.

* STANDARD ERROR

** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

Table B-5 (CONTD)

ABUNDANCE (NO./CUBIC METER) OF MICROZOOPLANKTON FROM
WISCONSIN NET (76 MICRON) OBLIQUE TOWS
NINE MILE POINT VICINITY, 1977

CLADOCERA

DEPTH CONTOUR	TRAN-SECT	OCT MEAN	OCT S.E.*	NOV MEAN	NOV S.E.	DEC MEAN	DEC S.E.
10	NMPW	972.	117.	202.	34.	1816.	107.
	NMPP	331.	0.	195.	22.	820.	93.
	FITZ	1028.	25.	174.	25.	1481.	71.
	NMPE	957.	104.	280.	93.	1242.	188.
CONTOUR MEAN		822.	164.	213.	23.	1340.	209.
20	NMPW	1252.	537.	479.	84.	609.	87.
	NMPP	345.	75.	666.	121.	1735.	413.
	FITZ	836.	139.	192.	44.	928.	437.
	NMPE	422.	188.	223.	39.	720.	0.
CONTOUR MEAN		714.	209.	390.	112.	998.	254.
40	NMPW	1059.	96.	1370.	79.	1550.	147.
	NMPP	1845.	60.	3769.	365.	1067.	206.
	FITZ	794.	112.	1970.	75.	1804.	0.
	NMPE	1623.	603.	444.	37.	1109.	161.
CONTOUR MEAN		1328.	245.	1888.	701.	1382.	178.
60	NMPW	756.	166.	963.	162.	1186.	79.
	NMPP	1137.	15.	1190.	219.	975.	89.
	FITZ	1382.	92.	831.	22.	1776.	377.
	NMPE	1293.	245.	1608.	172.	1661.	255.
CONTOUR MEAN		1142.	138.	1148.	170.	1404.	193.
CONTROL MEAN**		1042.	128.	696.	194.	1239.	153.
EXP. MEAN**		951.	180.	1123.	436.	1323.	148.
MONTHLY MEAN		1001.	107.	910.	237.	1281.	103.
MONTHLY RANGE		331.-	1845.	174.-	3769.	609.-	1816.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

Table B-6

MONTHLY OCCURRENCE AND RELATIVE ABUNDANCE (BY NUMBER) OF MACROZOOPLANKTON COLLECTED IN THE VICINITY OF NINE MILE POINT, APRIL-DECEMBER 1977

Scientific Name	Collection Date 15 Apr	11 May	14 Jun	13 Jul	9 Aug	12 Sep	11 Oct	7 Nov	16 Dec	Annual Average
Coelenterata (Cnideria)										
Hydrozoa										
Hydra americana		T*	T			8				T
Hydra sp.								T		T
Corylosoma lecustris							T			T
Nematoda										
Nematoda unid.			T	T						T
Annelida										
Oligochaeta										
Naididae unid.			T	T		T				T
Arachnida										
Prostigmata										
Hydracarina unid.		T		T						T
Arthropoda										
Cladocera										
Bosminidae unid.		T	7	2	T	1	11	3	1	T
Eurycercus lamellatus				T		T				T
Daphnia ambigua				T						T
D. galeata mendotae			2	13	31	13	61	52	89	31.5
D. longiremus			5	T						T
D. retrocurva		T	67	27	65	19	7	13	T	64.3
D. pulex	18	8	1	1						T
D. parvula			1							T
D. schodleri				T						T
Daphnia sp.	T									T
Ceriodaphnia sp.		T	T	3						T
Helopedium gibberum			T	1		21	9	T		0.1
Leptodora kindtii		T	6	14	3	37	11	T	T	3.5
Polyphemus pediculus				5						T
Sida crystallina						T		T		T
Diaphanosoma sp.								T		T
Ostracoda										
Ostracoda, unid.		T				T				T
Copepoda										
Calanoida										
Diaptomus oregonensis	T	T	T		T	T	1	4	3	0.1
D. sicilis	T	18	1				T	18	1	0.1
Eurytemura affinis	T			T				T	T	T
Limnocalanus macrurus	27	55	1	32			T	9	4	0.2
Epischura lacustris		T	T							T
Calanoida immature	55	18	1	2		T		T		0.1
Cyclopoida										
Cyclops bicuspidatus thomasi		1	3	T	T				T	0.2
C. vernalis		T								T
Tropocyclops prasinus mexicana			T							T
Cyclopoida juvenile	T	T	5	T	T					T
Amphipoda										
Pontoporeia affinis			T	T						T
Insecta										
Diptera										
Diptera unid.		T	T	T						T
Total (No./m^3)	45	312	36	151	127,521	219	309	396	241	13,982
Number of Taxa	7	17	22	22	7	12	9	13		35

*T = < 0.5%

Table B-7

ABUNDANCE (NO./1000 CUBIC METERS) OF MACROZOOPLANKTON FROM COMPOSITED* 1-METER HENSEN NET (571 MICRON) TOWS NINE MILE POINT VICINITY, 1977

CLADOCERA

Date	20-Ft Contour**							40-Ft Contour**							60-Ft NMPP	80-Ft NMPP	100-Ft NMPP	Grand Mean
	3-West	1-West	1/2-West	1/2-East	1-East	3-East	Mean	3-West	1-West	1/2-West	1/2-East	1-East	3-East	Mean				
Apr	10456	4162	9391	5728	13353	3630	7787	832	2065	2231	4129	14252	1432	4157	1032	233	333	4684
May	3397	3297	4895	7925	10223	466	5034	2298	2930	3463	6660	3896	133	3230	24808	7726	599	5514
Jun	10589	8691	5395	5561	8658	8492	7898	10090	10290	9191	12488	14552	6693	10551	10390	11855	11921	9657
Jul	43490	105161	85651	5128	6760	4595	41836	101765	97469	46620	5361	2231	4429	42979	932	43556	37130	39367
Aug	3.4×10^6	3.0×10^6	1.2×10^7	1.4×10^7	4.5×10^7	2.3×10^7	1.7×10^7	5.5×10^6	6.4×10^6	6.1×10^6	5.9×10^7	5.4×10^7	1.0×10^8	3.9×10^7	1.0×10^8	4.7×10^7	7.5×10^6	3.2×10^7
Sep	171928	102031	51943	53280	33367	16850	71567	223110	86180	46687	56776	46220	26640	80936	53114	68365	59341	73056
Oct	222111	222111	137729	75158	70196	179387	151115	182094	164002	93140	106893	82850	187679	136108	56976	42124	121978	129628
Nov	24209	16683	14552	37829	89044	48751	38528	13415	7992	12721	405960	399800	952180	299511	37096	15984	62071	142892
Dec	31535	42957	57343	15018	271062	274092	115335	29171	31169	40792	49817	77689	144788	62238	25175	57742	103763	83474

*Composite of surface, mid-depth, and bottom horizontal tows.

**Stations along contours are established within 3, 1, and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1.

Table B-8

ABUNDANCE (NO./1000 CUBIC METERS) OF MACROZOOPLANKTON
FROM COMPOSITED* 1-METER HENSEN NET (571 MICRON) TOWS
NINE MILE POINT VICINITY, 1977

COPEPODA-CALANOIDA

Date	20-Ft Contour**							40-Ft Contour**							60-Ft NMPP	80-Ft NMPP	100-Ft NMPP	Grand Mean
	3-West	1-West	1/2-West	1/2-East	1-East	3-East	Mean	3-West	1-West	1/2-West	1/2-East	1-East	3-East	Mean				
Apr	5528	7892	26240	8325	8092	5994	10345	2997	7026	6560	8025	19148	5228	8164	23144	9790	10623	10308
May	2997	11921	9690	11255	60939	29138	21023	13120	32035	22611	15584	28039	11222	20435	148518	138029	142624	45195
Jun	233	133	100	0	166	533	194	300	266	133	200	266	333	250	67	433	832	266
Jul	200	0	0	266	595	133	200	0	0	0	2264	1765	932	827	1565	62071	19414	5947
Aug	0	28572	0	0	0	0	4762	26973	0	0	286946	0	392041	117660	0	0	19114	50241
Sep	699	0	0	0	0	0	117	0	0	0	266	0	0	44	0	0	433	93
Oct	3097	4795	2930	866	533	999	2203	1732	3230	899	533	733	4595	1954	566	433	433	1758
Nov	17183	46021	43656	11722	10356	2531	21911	35032	116017	80386	14486	14752	12687	45560	49084	54013	35531	36230
Dec	3563	3263	1232	1498	22444	18348	8392	8192	3996	4262	5528	11189	22777	9324	4362	6527	8824	8400

*Composite of surface, mid-depth, and bottom horizontal tows.

**Stations along contours are established within 3, 1, and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1.

APPENDIX C

PERIPHYTON

- Bottom
- Suspended

Table C-1

SPECIES LIST OF BOTTOM PERIPHYTON COLLECTED ON ARTIFICIAL SUBSTRATES IN THE VICINITY OF NINE MILE POINT, 1977

- Cyanophyta
  - Chroococcales
    - Agmenellum sp.
    - Chlorogloea sp.
    - Chroococcus sp.
    - Entophysalis sp.
    - Gomphosphaeria aponina
    - Gomphosphaeria lacustris
    - Gomphosphaeria naegelianum
    - Gomphosphaeria sp.
    - Microcystis sp.
  - Chroococcales Unid.
  - Chamaesiphonales
    - Chamaesiphon sp.
  - Dermocarpales
    - Stichosiphon sp.
  - Oscillatoriales
    - Oscillatoria limnetica
    - Oscillatoria sp.
    - Lyngbya sp.
    - Spirulina laxa
  - Oscillatoriales Unid.
  - Nostocales
    - Anabaena sphaerica
    - Anabaena spiroides
    - Anabaena sp.
    - Aphanizomenon flos-aque
    - Aphanizomenon sp.
    - Anabaenopsis sp.
  - Nostocales Unid.
  - Rivulariales
    - Calothrix sp.
- Chlorophyta
  - Volvocales
    - Carteria sp.
    - Chlamydomonas sp.
    - Eudorina elegans
    - Eudorina sp.
    - Pandorina morum
    - Pandorina sp.
  - Volvocales Unid.
  - Tetrasporales
    - Chaetopeltis americana
    - Chlorangiogloea sp.
    - Elakotothrix sp.
    - Gloecystis sp.
    - Stylosphaeridium sp.
    - Tetraspora sp.
  - Tetrasporales Unid.
  - Chlorococcales
    - Actinastrum hantzschii
    - Actinastrum sp.
    - Ankistrodesmus convolutus
    - Ankistrodesmus falcatus
    - Ankistrodesmus spiralis
    - Ankistrodesmus viridis
    - Ankistrodesmus sp.
    - Ankyra sp.
    - Characium
    - Chlorella sp.
    - Chodatella citriformis
    - Chodatella sp.
    - Closteriopsis longissima
    - Closteriopsis sp.
    - Coelastrum microporum
    - Coelastrum sp.
    - Crucigenia apiculata
    - Crucigenia quadrata
    - Crucigenia rectnagularis
    - Crucigenia tetrapedia
    - Crucigenia sp.
    - Dictyosphaerium pulchellum
    - Dictyosphaerium sp.
    - Didymocystis sp.
    - Franceia sp.
    - Gloeoactinium sp.
    - Golenkinia radiata
    - Golenkinia sp.
    - Hydrodictyon sp.
    - Kirschneriella lunaris
    - Kirschneriella obesa
    - Kirschneriella sp.
    - Micractinium pusillum
    - Micractinium sp.
    - Nephrocytium sp.
    - Oocystis sp.
    - Pediastrum boryanum
    - Pediastrum duplex
    - Pediastrum simplex

- Chlorophyta (Contd)
    - Pediastrum tetras
    - Pediastrum sp.
    - Scenedesmus acuminatus
    - Scenedesmus acutus
    - Scenedesmus arcuatus
    - Scenedesmus armatus
    - Scenedesmus bukkensis
    - Scenedesmus denticulatus
    - Scenedesmus ecornis
    - Scenedesmus incrassatulus
    - Scenedesmus intermedius
    - Scenedesmus opoliensis
    - Scenedesmus quadricauda
    - Scenedesmus spinosus
    - Scenedesmus sp.
    - Schroederia sp.
    - Selenastrum gracile
    - Selenastrum minutum
    - Selenastrum sp.
    - Sphaerocystis sp.
    - Tetraedron caudatum
    - Tetraedron minimum
    - Tetraedron muticum
    - Tetraedron regulare
    - Tetraedron sp.
    - Tetrastrum heterocanthum
    - Tetrastrum staurogeniaeforme
    - Tetrastrum sp.
    - Treubaria triappendiculata
  - Chlorococcales Unid
  - Ulotrichales
    - Schizomeris sp.
    - Ulothrix subconstricta
    - Ulothrix subtilis
    - Ulothrix tenerrima
    - Ulothrix tenuissima
    - Ulothrix zonata
    - Ulothrix sp.
  - Ulotrichales Unid
  - Chaetophorales
    - Chaetophora sp.
    - Leptosira sp.
    - Protoderma sp.
    - Pseudulvella sp.
    - Stigeoclonium polymorphum
    - Stigeoclonium sp.
    - Ulvella sp.
  - Chaetophorales Unid
  - Oedogoniales
    - Bulbochaete sp.
    - Oedogonium sp.
  - Cladophorales
    - Cladophora
    - Rhizoclonium sp.
  - Cladophorales Unid.
  - Zygnematales
    - Closterium moniliferum
    - Closterium sp.
    - Cosmarium botrytis
    - Cosmarium cosmetum
    - Cosmarium cyclicum
    - Cosmarium sp.
    - Mougeotia sp.
    - Strogonium sp.
    - Spirogyra sp.
    - Staurastrum cuspidatum
    - Staurastrum longiradiatum
    - Staurastrum megacanthum
    - Staurastrum paradoxum
    - Staurastrum sp.
  - Zygnematales Unid
- Chlorophyta Unid.
- Euglenophyta
  - Euglenales
    - Phacus sp.
    - Trachelomonas sp.
- Xanthophyta
  - Heterotrichales
    - Tribonema affine
    - Tribonema sp.
  - Rhizochloridales
    - Stipitococcus sp.
- Chrysophyta
  - Chrysomonadales
    - Chrysochromulina sp.
    - Chrysococcus sp.
    - Dinobryon divergens
    - Dinobryon sociale
    - Dinobryon sp.
    - Mallamonas sp.
    - Synura sp.
  - Chrysomonadales Unid

- Chrysophyta (Contd)
  - Rhizochrysidales
    - Diceras sp.
    - Lagynion sp.
    - Rhizochrysis sp.
  - Chrysocapsales
    - Chrysocapsa sp.
  - Isochrysidales
  - Isochrysidales Unid.
  - Monosigales
    - Codosiga sp.
    - Monosiga sp.
    - Stelexomonas dichotoma
- Chrysophyta Unid
- Bacillariophyta-Centric
  - Eupodiscales
    - Cyclotella sp.
    - Melosira variens
    - Melosira sp.
    - Skeletonema potamus
    - Sekeltonema subsalsa
    - Skeletonema sp.
    - Stephanodiscus astraea
    - Stephanodiscus hantzschii
    - Stephanodiscus niagarae
    - Stephanodiscus sp.
  - Eupodiscales Unid.
  - Biddulphiales
    - Bacteriastrum sp.
- Bacillariophyta-Pennate
  - Fragilariales
    - Asterionella formosa
    - Asterionella sp.
    - Diatoma tenue
    - Diatoma vulgare
    - Diatoma sp.
    - Fragilaria crotonensis
    - Fragilaria sp.
    - Meridion sp.
    - Synedra cyclopum
    - Synedra ulna
    - Synedra sp.
    - Tabellaria flocculosa
    - Tabellaria sp.
  - Fragilariales Unid.
  - Eunotiales
    - Eunotia sp.
  - Achnanthales
    - Achnanthes sp.
    - Cocconeis sp.
    - Rhoicosphenia curvata
    - Rhoicosphenia sp.
  - Achnanthales Unid.
  - Naviculales
    - Amphora sp.
    - Cymbella sp.
    - Gomphonema sp.
    - Gyrosigma sp.
    - Navicula cryptocephala
    - Navicula sp.
    - Pinnularia sp.
    - Pleurosigma sp.
  - Naviculaes Unid.
  - Bacillariales
    - Nitzchia acicularis
    - Nitzchia holsatica
    - Nitzchia longissima
    - Nitzchia sp.
  - Surirellales
    - Surirella sp.
- Bacillariophyta-Pennate Unid
- Pyrrhophyta-Dinophyceae
  - Gymnodiniales
    - Gymnodinium fuscum
    - Gymnodinium helveticum
    - Gynodinium sp.
  - Peridiniales
    - Ceratium hirundinella
    - Peridinium aciculiferum
    - Peridinium gymnodinium
    - Peridinium sp.
  - Peridiniales Unid
- Pyrrhophyta-Dinophyceae Unid
- Cryptophyta
  - Cryptomonodales
    - Chroomonas sp.
    - Cryptomonas marssonii
    - Cryptomonas reflexa
    - Cryptomonas sp.
    - Rhodomonas lens
    - Rhodomonas lens
    - Rhodomonas minuta
    - Rhodomonas sp.
  - Cryptomonadales Unid

Table C-2

SEASONAL OCCURRENCE AND RELATIVE ABUNDANCE (BY NUMBER) FOR THE MORE ABUNDANT* BOTTOM PERIPHYTON COLLECTED ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

	Spring May 2-25	Early Summer May 25-Jun 30	Mid Summer Jun 30-Jul.27	Late Summer Jul 27-Sep 6	Early Fall Sep 6-30	Fall Sep 30-Oct 25	Late Fall Oct 25-Nov 30	Winter Nov 30-Dec 16	Annual Mean
Cyanophyta									
Chroococcales									
Chlorogloea sp.	-	-	-	-	-	-	3	-	T
Gomphosphaeria sp.	-	-	-	-	5	3	-	-	T
Microcystis sp.	-	T	-	-	4	3	-	-	T
Chamaesiphonales									
Chamaesiphon sp.	-	T	19	-	-	-	-	-	T
Oscillatoriales									
Oscillatoria sp.	1	T	T	T	2	1	3	T	1
Lyngbya sp.	-	-	15	60	9	8	18	25	21
Anabaena sp.	-	T	T	T	3	2	T	-	T
Aphanizomenon flos-aque	-	T	-	T	6	4	3	-	T
Chlorophyta									
Volvocales									
Chlamydomonas sp.	-	T	T	-	3	1	T	-	T
Tetrasporales									
Chaetopeltis americana	-	-	-	12	-	-	-	-	4
Tetrasporales Unid.	-	2	T	-	T	-	-	-	T
Chlorococcales									
Ankistrodesmus falcatus	T	T	-	-	-	-	-	2	T
Coelastrum microporum	-	1	1	2	4	3	T	-	1
Oocystis sp.	-	T	T	-	1	2	T	-	T
Pediastrum boryanum	2	6	2	3	2	1	-	2	2
Pediastrum duplex	-	2	1	T	1	T	-	-	T
Pediastrum simplex	-	-	2	T	6	3	-	-	T
Scenedesmus acutus	9	3	T	3	1	-	T	-	6
Scenedesmus quadricauda	2	7	1	1	2	T	1	1	2
Scenedesmus sp.	5	1	T	-	1	T	T	2	3
Sphaerocystis sp.	-	-	T	-	2	4	T	-	T
Chlorococcales Unid.	5	4	T	T	2	1	T	2	3
Ulotrichales									
Ulothrix subconstricta	2	-	-	-	-	-	-	-	1
Ulothrix tenuissima	14	T	-	-	-	-	-	-	7
Ulothrix sp.	14	T	-	-	-	-	-	-	8
Chaetophorales									
Stigeoclonium sp.	2	6	-	7	1	5	1	2	4
Ulvella sp.	-	-	5	-	-	-	-	-	T
Chaetophorales Unid.	-	2	26	5	-	6	9	-	3
Oedogoniales									
Oedogonium sp.	-	2	3	-	T	T	1	T	T
Closterum sp.	-	-	-	-	T	3	T	T	T
Chlorophyta Unid.	T	2	2	1	2	2	T	-	T
Chrysophyta									
Monosigales									
Codosiga sp.	-	-	3	-	-	T	T	-	T
Bacillariophyta-Centric									
Eupodiscales									
Melosira sp.	T	1	T	-	6	T	1	-	T
Eupodiscales Unid.	3	3	1	-	2	3	2	1	2
Bacillariophyta-Pennate									
Fragilariales									
Asterionella formosa	T	T	-	-	T	3	6	3	T
Diatoma tenue	15	2	-	-	-	-	-	T	8
Fragilaria crotonensis	-	3	T	-	1	8	2	T	T
Fragilaria sp.	1	1	1	-	T	2	3	3	1
Fragilariales Unid.	2	2	-	-	T	T	1	-	1
Achnanthales									
Rhoicosphenia curvata	-	-	1	-	T	1	1	2	T
Naviculales									
Gomphonema sp.	T	T	-	-	T	1	8	3	T
Navicula sp.	T	2	1	-	T	T	4	-	T
Naviculales Unid.	T	2	-	-	1	1	5	9	T
Bacillariales									
Nitzchia sp.	T	2	-	-	T	T	-	7	T
Bacillariophyta-Pennate Unid.	7	10	2	T	6	4	11	19	5
Chryptophyta									
Cryptomonodales									
Cryptomonas sp.	- -	2	1	-	2	1	2	1	T
Rhodomonas minuta	- -	5	-	-	10	8	6	1	1
Total Density (No./m^3)	61,796	3,563	2,504	37,926	3,755	1,285	1,346	2,105	14,285
Total No. of Taxa	109	125	104	104	112	97	72	85	101

*Taxa listed include only those that accounted for at least 2% of the bottom periphyton collected during one or more of the 1977 sampling periods.

Table C-3

ABUNDANCE (NO./SQUARE MILLIMETER) OF BOTTOM PERIPHYTON ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

CYANOPHYTA

DEPTH CONTOUR	TRAN-SECT	MAY 2-25 MAY MEAN	S.E.*	JUN 25 MAY -30 JUN MEAN	S.E.	JUL 30 JUN -27 JUL MEAN	S.E.	AUG 27 JUL - 6 SEP MEAN	S.E.	SEP 6-30 SEP MEAN	S.E.	OCT 30 SEP -25 OCT MEAN	S.E	NOV 25 OCT -30 NOV MEAN	S.E.*	DEC 30 NOV -16 DEC MEAN	S.E.
5	NMPW	5123.	4890.	0.	0.	********	0.	232077.	118574.	********	0.	265.	101.	********	0.	********	0.
	NMPP	0.	0.	********	0.	65.	26.	********	0.	********	0.	573.	224.	********	0.	********	0.
	FITZ	3574.	1263.	0.	0.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.
	NMPE	7317.	7317.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.
CONTOUR MEAN		4028.	1537.	0.	0.	65.	65.	232077.	232077.	0.	0.	419.	154.	0.	0.	0.	0.
10	NMPW	0.	0.	0.	0.	********	0.	2752.	666.	665.	112.	********	0.	24.	14.	********	0.
	NMPP	0.	0.	********	0.	645.	537.	********	0.	2798.	1225.	********	0.	********	0.	********	0.
	FITZ	17703.	10193.	28.	17.	********	0.	257.	165.	686.	297.	30.	16.	306.	203.	********	0.
	NMPE	270.	270.	********	0.	********	0.	********	0.	********	0.	4.	4.	1146.	353.	********	0.
CONTOUR MEAN		4493.	4404.	14.	14.	645.	645.	1504.	1247.	1383.	708.	17.	13.	492.	337.	0.	0.
20	NMPW	413.	251.	119.	117.	********	0.	1603.	598.	********	0.	239.	239.	********	0.	********	0.
	NMPP	0.	0.	132.	88.	********	0.	1413.	804.	1288.	313.	818.	224.	********	0.	1.	1.
	FITZ	0.	0.	60.	52.	4796.	1965.	********	0.	358.	227.	219.	219.	304.	69.	3343.	2701.
	NMPE	0.	0.	48.	48.	********	0.	912.	515.	492.	291.	********	0.	********	0.	********	0.
CONTOUR MEAN		103.	103.	90.	21.	4796.	4796.	1376.	253.	713.	290.	425.	196.	304.	304.	1672.	1671.
30	NMPW	103.	67.	15.	9.	4.	4.	744.	401.	1858.	259.	********	0.	37.	37.	********	0.
	NMPP	0.	0.	64.	64.	********	0.	********	0.	1036.	323.	485.	318.	367.	40.	********	0.
	FITZ	0.	0.	303.	132.	118.	99.	********	0.	********	0.	409.	218.	435.	154.	130.	36.
	NMPE	59.	59.	20.	20.	********	0.	212.	107.	1523.	657.	1.	1.	********	0.	6.	4.
CONTOUR MEAN		41.	25.	100.	68.	61.	57.	478.	263.	1472.	239.	298.	150.	280.	123.	68.	62.
40	NMPW	0.	0.	73.	52.	0.	0.	59.	94.	********	0.	456.	209.	479.	212.	14.	6.
	NMPP	41.	32.	49.	49.	54.	35.	860.	699.	1679.	202.	264.	131.	********	0.	9.	5.
	FITZ	0.	0.	103.	48.	89.	52.	********	0.	544.	220.	388.	65.	********	0.	********	0.
	NMPE	0.	0.	73.	43.	********	0.	10.	10.	********	0.	25.	9.	********	0.	********	0.
CONTOUR MEAN		10.	10.	74.	11.	48.	26.	330.	276.	1111.	567.	283.	55.	479.	479.	11.	3.
CONTROL MEAN**		1328.	833.	44.	15.	2.	2.	29826.	28895.	1135.	330.	165.	76.	422.	264.	10.	4.
EXP. MEAN**		2142.	1767.	92.	33.	961.	773.	850.	334.	1198.	317.	398.	84.	353.	31.	871.	825.
MONTHLY MEAN		1735.	955.	68.	19.	721.	587.	21923.	21017.	1175.	224.	298.	65.	387.	124.	584.	552.
MONTHLY RANGE		0.-	17703.	0.-	303.	0.-	4796.	10.-	232077.	358.-	2798.	1.-	818.	24.-	1146.	1.-	3343.

* STANDARD ERROR

** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

********SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

Table C-4

ABUNDANCE (NO./SQUARE MILLIMETER) OF BOTTOM PERIPHYTON ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

CHLOROPHYTA

DEPTH CONTOUR	TRAN-SECT	MAY 2-25 MAY MEAN	S.E.*	JUN 25 MAY -30 JUN MEAN	S.E.	JUL 30 JUN -27 JUL MEAN	S.E.	AUG 27 JUL - 6 SEP MEAN	S.E.	SEP 6-30 SEP MEAN	S.E.	OCT 30 SEP -25 OCT MEAN	S.E	NOV 25 OCT -30 NOV MEAN	S.E.*	DEC 30 NOV -16 DEC MEAN	S.E.
5	NMPW	121818.	35989.	1929.	972.	********	0.	132467.	19080.	********	0.	915.	279.	********	0.	********	0.
	NMPP	178934.	28306.	********	0.	515.	66.	********	0.	********	0.	1175.	300.	********	0.	********	0.
	FITZ	106308.	38871.	1987.	357.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.
	NMPE	57804.	12139.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.
CONTOUR MEAN		116216.	24958.	1958.	29.	515.	515.	132467.	132467.	0.	0.	1045.	130.	0.	0.	0.	0.
10	NMPW	58176.	17464.	879.	227.	********	0.	7679.	3704.	1410.	140.	********	0.	21.	12.	********	0.
	NMPP	79336.	20141.	********	0.	1139.	404.	********	0.	2811.	748.	********	0.	********	0.	********	0.
	FITZ	118082.	59775.	1235.	281.	********	0.	20079.	6654.	1221.	131.	207.	66.	105.	34.	********	0.
	NMPE	41459.	4227.	********	0.	********	0.	********	0.	********	0.	144.	35.	1565.	463.	********	0.
CONTOUR MEAN		74263.	16535.	1057.	178.	1139.	1139.	13879.	6200.	1814.	501.	176.	31.	564.	501.	0.	0.
20	NMPW	4175.	524.	2066.	749.	********	0.	2761.	364.	********	0.	368.	98.	********	0.	********	0.
	NMPP	6949.	1255.	2958.	733.	********	0.	1254.	256.	1576.	118.	342.	117.	********	0.	7.	3.
	FITZ	1631.	301.	2259.	1165.	5182.	1712.	********	0.	593.	186.	358.	73.	124.	47.	1277.	1261.
	NMPE	749.	200.	3765.	1089.	********	0.	1735.	1160.	815.	87.	********	0.	********	0.	********	0.
CONTOUR MEAN		3376.	1395.	2762.	385.	5182.	5182.	1916.	444.	995.	298.	356.	8.	124.	124.	642.	635.
30	NMPW	1491.	538.	1777.	729.	277.	41.	1125.	369.	1713.	235.	********	0.	86.	54.	********	0.
	NMPP	1053.	107.	3017.	999.	********	0.	********	0.	793.	330.	425.	97.	66.	26.	********	0.
	FITZ	722.	237.	1187.	412.	547.	62.	********	0.	********	0.	331.	25.	62.	28.	438.	334.
	NMPE	383.	79.	775.	251.	********	0.	1422.	459.	1355.	341.	657.	304.	********	0.	22.	9.
CONTOUR MEAN		912.	237.	1689.	488.	412.	135.	1274.	148.	1287.	268.	471.	97.	71.	7.	230.	208.
40	NMPW	1342.	269.	852.	276.	990.	125.	705.	285.	********	0.	844.	177.	46.	20.	14.	4.
	NMPP	1036.	164.	3787.	1456.	1726.	896.	703.	539.	1074.	348.	684.	294.	********	0.	14.	5.
	FITZ	839.	260.	572.	117.	389.	154.	********	0.	575.	171.	393.	98.	********	0.	********	0.
	NMPE	527.	199.	403.	41.	********	0.	2376.	637.	********	0.	68.	7.	********	0.	********	0.
CONTOUR MEAN		861.	121.	1406.	799.	1035.	387.	1261.	557.	824.	249.	497.	171.	46.	46.	14.	0.
CONTROL MEAN**		26762.	12924.	1557.	383.	634.	356.	18784.	16259.	1324.	187.	500.	147.	429.	379.	18.	4.
EXP. MEAN**		49489.	20848.	2125.	387.	1583.	749.	7345.	6369.	1235.	296.	489.	109.	89.	15.	434.	299.
MONTHLY MEAN		39126.	12172.	1841.	273.	1346.	573.	15664.	11806.	1267.	193.	494.	85.	259.	187.	295.	208.
MONTHLY RANGE		283.-	178934.	403.-	3787.	277.-	5182.	703.-	132467.	575.-	2811.	68.-	1175.	21.-	1565.	7.-	1277.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
********SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

Table C-5

ABUNDANCE (NO./SQUARE MILLIMETER) OF BOTTOM PERIPHYTON ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

BACILLARIOPHYTA-CENTRIC

		MAY		JUN		JUL		AUG		SEP		OCT		NOV		DEC	
		2-25 MAY		25 MAY -30 JUN		30 JUN -27 JUL		27 JUL - 6 SEP		6-30 SEP		30 SEP -25 OCT		25 OCT -30 NOV		30 NOV -16 DEC	
DEPTH CONTOUR	TRAN-SECT	MEAN	S.E.*	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E	MEAN	S.E.*	MEAN	S.E.
5	NMPW	2891.	2010.	143.	41.	********	0.	0.	0.	********	0.	46.	13.	********	0.	********	0.
	NMPP	7766.	3495.	********	0.	48.	7.	********	0.	********	0.	22.	14.	********	0.	********	0.
	FITZ	1539.	1324.	242.	68.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.
	NMPE	1584.	150.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.
CONTOUR	MEAN	3445.	1474.	192.	50.	48.	48.	0.	0.	0.	0.	34.	12.	0.	0.	0.	0.
10	NMPW	5137.	1804.	103.	15.	********	0.	54.	22.	370.	157.	********	0.	5.	2.	********	0.
	NMPP	5292.	1294.	********	0.	60.	15.	********	0.	1359.	390.	********	0.	********	0.	********	0.
	FITZ	6977.	298.	109.	27.	********	0.	0.	0.	189.	65.	1.	1.	156.	55.	********	0.
	NMPE	5392.	1000.	********	0.	********	0.	********	0.	********	0.	0.	0.	37.	5.	********	0.
CONTOUR	MEAN	5700.	429.	106.	3.	60.	60.	27.	27.	639.	364.	1.	0.	66.	46.	0.	0.
20	NMPW	1144.	261.	60.	36.	********	0.	160.	57.	********	0.	111.	32.	********	0.	********	0.
	NMPP	2473.	203.	178.	73.	********	0.	38.	9.	346.	84.	71.	13.	********	0.	19.	15.
	FITZ	268.	236.	80.	29.	48.	39.	********	0.	82.	27.	133.	36.	42.	10.	277.	242.
	NMPE	335.	126.	298.	170.	********	0.	57.	42.	33.	8.	********	0.	********	0.	********	0.
CONTOUR	MEAN	1055.	513.	154.	55.	48.	48.	85.	38.	154.	97.	105.	18.	42.	42.	148.	129.
30	NMPW	164.	25.	321.	102.	23.	7.	37.	13.	866.	179.	********	0.	57.	16.	********	0.
	NMPP	270.	56.	512.	283.	********	0.	********	0.	73.	37.	14.	2.	43.	11.	********	0.
	FITZ	174.	108.	217.	54.	49.	12.	********	0.	********	0.	246.	87.	75.	23.	16.	10.
	NMPE	43.	5.	88.	17.	********	0.	29.	29.	335.	96.	25.	14.	********	0.	19.	5.
CONTOUR	MEAN	163.	47.	285.	90.	36.	13.	33.	4.	425.	233.	95.	76.	58.	9.	17.	1.
40	NMPW	34.	37.	115.	51.	80.	34.	12.	7.	********	0.	56.	20.	47.	13.	5.	1.
	NMPP	110.	15.	219.	77.	92.	23.	4.	4.	111.	54.	27.	9.	********	0.	8.	4.
	FITZ	118.	96.	104.	17.	32.	17.	********	0.	53.	22.	23.	5.	********	0.	********	0.
	NMPE	90.	61.	45.	11.	********	0.	7.	7.	********	0.	3.	1.	********	0.	********	0.
CONTOUR	MEAN	113.	9.	121.	36.	68.	19.	8.	2.	82.	29.	27.	11.	47.	47.	6.	2.
CONTROL	MEAN**	1691.	660.	147.	37.	51.	28.	45.	18.	401.	172.	40.	17.	36.	11.	12.	7.
EXP.	MEAN**	2499.	962.	208.	49.	55.	8.	14.	12.	316.	178.	67.	30.	79.	27.	80.	66.
MONTHLY	MEAN	2095.	575.	177.	31.	54.	8.	36.	14.	347.	125.	56.	18.	58.	16.	57.	44.
MONTHLY	RANGE	43.-	7766.	45.-	512.	23.-	92.	0.-	160.	33.-	1359.	0.-	246.	5.-	156.	5.-	277.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW: EXPERIMENTAL REPRESENTS NMPP & FITZ
********SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

Table C-6

ABUNDANCE (NO./SQUARE MILLIMETER) OF BOTTOM PERIPHYTON ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

BACILLARIOPHYTA-PENNATE

DEPTH CONTOUR	TRAN-SECT	MAY 2-25 MAY MEAN	S.E.*	JUN 25 MAY -30 JUN MEAN	S.E.	JUL 30 JUN -27 JUL MEAN	S.E.	AUG 27 JUL - 6 SEP MEAN	S.E.	SEP 6-30 SEP MEAN	S.E.	OCT 30 SEP -25 OCT MEAN	S.E	NOV 25 OCT -30 NOV MEAN	S.E.*	DEC 30 NOV -16 DEC MEAN	S.E.
5	NMPW	33974.	6384.	54.	37.	********	0.	1276.	818.	********	0.	909.	572.	********	0.	********	0.
	NMPP	40511.	5306.	********	0.	4.	2.	********	0.	********	0.	387.	253.	********	0.	********	0.
	FITZ	18754.	3718.	406.	123.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.
	NMPE	36668.	8864.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.	********	0.
CONTOUR MEAN		32476.	4767.	230.	176.	4.	4.	1276.	1276.	0.	0.	648.	261.	0.	0.	0.	0.
10	NMPW	25009.	7276.	178.	135.	********	0.	104.	104.	31.	6.	********	0.	22.	8.	********	0.
	NMPP	38215.	10582.	********	0.	119.	93.	********	0.	333.	82.	********	0.	********	0.	********	0.
	FITZ	36023.	4951.	157.	57.	********	0.	34.	21.	112.	37.	95.	9.	394.	208.	********	0.
	NMPE	43796.	2174.	********	0.	********	0.	********	0.	********	0.	16.	5.	807.	167.	********	0.
CONTOUR MEAN		35761.	3940.	168.	11.	119.	119.	69.	35.	159.	90.	56.	39.	407.	227.	0.	0.
20	NMPW	10920.	649.	622.	238.	********	0.	192.	69.	********	0.	288.	229.	********	0.	********	0.
	NMPP	29346.	3239.	419.	92.	********	0.	96.	39.	2554.	2042.	241.	22.	********	0.	20.	10.
	FITZ	21377.	1508.	629.	217.	157.	44.	********	0.	139.	38.	263.	94.	434.	73.	3920.	3170.
	NMPE	9276.	1154.	3076.	1611.	********	0.	828.	206.	83.	18.	********	0.	********	0.	********	0.
CONTOUR MEAN		17730.	4709.	1186.	632.	157.	157.	372.	230.	925.	815.	264.	14.	434.	434.	1970.	1950.
30	NMPW	1005.	460.	606.	217.	248.	84.	49.	14.	62.	17.	********	0.	543.	137.	********	0.
	NMPP	1139.	351.	6421.	2921.	********	0.	********	0.	187.	34.	115.	9.	233.	47.	********	0.
	FITZ	1790.	341.	1984.	186.	483.	164.	********	0.	********	0.	58.	12.	481.	114.	2218.	1641.
	NMPE	272.	18.	283.	80.	********	0.	120.	28.	305.	276.	38.	14.	********	0.	75.	37.
CONTOUR MEAN		1052.	311.	2323.	1415.	365.	118.	85.	35.	184.	70.	70.	23.	419.	95.	1147.	1072.
40	NMPW	.32.	23.	228.	128.	142.	30.	28.	20.	********	0.	585.	222.	[illegible]81.	432.	86.	35.
	NMPP	595.	138.	1746.	908.	274.	43.	0.	0.	536.	78.	623.	336.	********	0.	34.	9.
	FITZ	419.	147.	547.	306.	20.	3.	********	0.	56.	17.	210.	41.	********	0.	********	0.
	NMPE	267.	70.	229.	116.	********	0.	59.	47.	********	0.	28.	2.	********	0.	********	0.
CONTOUR MEAN		353.	100.	687.	361.	145.	73.	29.	17.	296.	240.	362.	145.	1081.	1081.	60.	26.
CONTROL MEAN**		16132.	5423.	659.	352.	195.	53.	332.	164.	120.	62.	311.	150.	613.	226.	80.	5.
EXP. MEAN**		168:7.	5305.	1538.	736.	176.	73.	43.	28.	560.	338.	249.	65.	385.	54.	1548.	944.
MONTHLY MEAN		17474.	3705.	1099.	410.	181.	55.	253.	124.	400.	220.	275.	71.	499.	116.	1059.	673.
MONTHLY RANGE		132.-	43796.	54.-	6421.	4.-	483.	0.-	1276.	31.-	2554.	16.-	909.	22.-	1081.	20.-	3920.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
******** SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

Table C-7

TAXONOMIC LIST OF ALL SUSPENDED PERIPHYTON COLLECTED ON ARTIFICIAL SUBSTRATES IN THE VICINITY OF NINE MILE POINT, MAY-SEPTEMBER 1977

Cyanophyta
- Chroococcaceae
  - Agmenellum sp.
- Chroococcaceae Unid.
  - Entophysalis sp.
  - Gomphosphaeria sp.
- Chamaesiphonaceae
  - Chamaesiphon sp.
- Oscillatoriaceae
  - Lyngbya sp.
  - Oscillatoria .
- Oscillatoriaceae Unid.
  - Pseudoanabaena sp.
- Nostocaceae
  - Anabaena flos-aquae
  - Anabaena sp.
  - Aphanizomenon flos-aque
  - Aphanizomenon sp.
- Nostacaceae Unid.

Chlorophyta
- Volvocales
  - Chlamydomonas sp.
  - Pandorina morum
  - Volvocales Unid.
- Tetrasporales
  - Chlorongiogloea sp.
  - Gloeocystis sp.
- Tetrasporales Unid.
- Chlorococcales
  - Actinastrum hantzschii
  - Actinastrum sp.
  - Ankistrodesmus convolutus
  - A. falcatus
  - Ankistrodesmus sp.
- Chlorococcales Unid.
  - Chlorococcum sp.
  - Chodatella longiseta
  - C. ciliata
  - Chodatella sp.
  - Closteriopsis longissima
  - Closteriopsis sp.
  - Coelastrum proboscidium
  - C. microporum
  - Coelastrum sp.
  - Caucigenia quadrata
  - Crucigenia sp.
  - Dictyosphaerium sp.
  - Kirschneriella contorta
  - Micractinium sp.
  - Oocystis sp.
  - Pediastrum duplex
  - P. boryanum
  - P. simplex
  - P. tetras
  - Pediastrum sp.
  - Quadrigula sp.
  - Scenedesmus acuminatus
  - S. acutus
  - S. bicaudatus
  - S. denticulatus
  - S. ecornis
  - S. quadricauda
  - S. opoliensis
  - S. spinosus
  - Scenedesmus sp.
  - Schroederia sp.
  - Selenastrum minutum
  - Tetrastrum heterocanthum
  - Tetrastrum sp.
- Ulotrichales
  - Ulothrix zonata
  - Ulothrix sp.
- Chaetophorales
- Chaetophorales Unid.
  - Stigeoclonium sp.
- Oedogoniales
- Oedogoniales Unid.
  - Oedogonium sp.
- Cladophorales
  - Cladophora sp.
- Zygnematales
  - Closterium moniliferum
  - Closterium sp.
  - Cosmarium cosmetum
  - C. botrytis
  - Cosmarium sp.
  - Mougeotia sp.
  - Spirogyra sp.
  - Staurastrum longiradiatum
  - Staurastrum sp.
- Zygnematales Unid.

Chlorophyta Unid.

Euglenophyta
- Euglenales
  - Euglena gracilis
  - Euglena sp.
- Phacus sp.
  - Trachelomonas sp.

Xanthophyta
- Heterotrichales
  - Tribonema sp.

Chrysophyta
- Chrysomonadales
- Chrysomonadales Unid.
  - Dinobryon sp.
- Monosigales
  - Codosiga sp.

Chrysophyta Unid.

Bacillariophyta
- Eupodiscales
  - Coscinodiscus sp.
  - Cyclotella sp.
- Eupodiscales Unid.
  - Melosira variens
  - Melosira sp.
  - Stephanodiscus astraea
  - Stephanodiscus sp.
- Fragilariales
  - Asterionella formosa
  - Asterionella sp.
  - Diatoma vulgare
  - D. tenue
  - Diatoma sp.
  - Fragilaria crotonensis
  - Fragilaria sp.
- Fragilariales Unid.
  - Meridion sp.
  - Synedra cyclopum
  - Synedra sp.
  - Tabellaria sp.
- Achnanthales
  - Achnanthes sp.
  - Cocconeis sp.
  - Rhoicosphenia curvata
  - Rhoicosphenia sp.
- Naviculales
  - Cymbella sp.
  - Gomphonema sp.
  - Gyrosigma sp.
  - Navicula sp.
- Naviculales Unid.
  - Pleurosigma/Gyrosigma
- Bacillariales
  - Nitzchia acicularis
  - Nitzchia sp.

Bacillariophyta Unid.

Pyrrhophyta-Dinophyceae
- Gymnodiniales
  - Gymnodinium sp.
- Peridiniales
  - Peridinium aciculiferum
  - Peridinium sp.

Pyrrhophyta-Dinophyceae Unid.

Cryptophyta
- Cryptomonodales
  - Chroomonas sp.
  - Cryptomonas sp.
  - Rhodomonas minuta
  - Rhodomonas sp.

Table C-8

SEASONAL OCCURRENCE AND RELATIVE ABUNDANCE (BY NUMBER) OF THE MORE ABUNDANT* SUSPENDED PERIPHYTON COLLECTED ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

Taxa	Spring 2-25 May	Early Summer 25 May-6 Jul	Mid Summer 6-27 Jul	Late Summer 27 Jul-25 Sep	Early Fall 2-30 Sep	Annual Mean
Cyanophyta						
Oscillatoriaceae						
Lyngbya sp.	-	-	88	90	80	64
Nostocaceae Unid.	-	2	-	-	-	T
Chlorophyta						
Chlorococcales						
Actinastrum hantzschii	2	-	-	T	T	T
Scenedesmus acutus	1	4	1	T	T	1
S. quadricauda	2	2	1	T	T	1
Scenedesmus sp.	1	2	T	-	T	T
Pediastrum boryanum	T	8	2	1	T	3
Pediastrum sp.	-	1	-	-	-	T
Chlorococcales Unid.	4	1	1	T	T	T
Zygnematales						
Mougeotia sp.	T	4	1	T	T	1
Bacillariophyta						
Fragillariales						
Diatoma tenue	48	26	T	-	-	7
Diatoma sp.	8	2	T	-	T	1
Fragilariales Unid.	2	10	T	T	1	3
Naviculales						
Gomphonema sp.	3	T	-	-	T	T
Naviculales Unid..	T	3	T	T	T	1
Bacillariophyta Unid.	16	26	2	1	2	10
Cryptophyta						
Cryptomonodales						
Rhodomonas sp.	3	T	T	T	-	T
Total Density (No./m^3)	19,776	675,266	141,755	1,237,391	586,328	532,103
Total No. of Taxa	69	67	60	31	54	56

*Taxa listed include only those that accounted for at least 1% of the suspended periphyton collected during one or more of the 1977 sampling periods.

Table C-9

ABUNDANCE (NO./SQUARE MILLIMETER) OF SUSPENDED PERIPHYTON ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

CYANOPHYTA

DEPTH CONTOUR	TRAN-SECT	MAY 2-25 MAY MEAN	S.E.*	JUN 25 MAY - 6 JUL MEAN	S.E.	JUL 6-27 JUL MEAN	S.E.	AUG 27 JUL - 2 SEP MEAN	S.E.	SEP 2-30 SEP MEAN	S.E.
2	NMPW	0.	0.	0.	0.	********	0.	416011.	343956.	158904.	49496.
	NMPP	0.	0.	30411.	30411.	680022.	357044.	1572747.	361508.	********	0.
	FITZ	0.	0.	140876.	140876.	229364.	11128.	********	0.	********	0.
CONTOUR MEAN		0.	0.	57096.	42800.	454693.	225329.	994379.	578369.	158904.	158904.
7	NMPW	0.	0.	0.	0.	********	0.	6035434.	609080.	4422385.	4073144.
	NMPP	41.	41.	3861.	3861.	72250.	69077.	1085644.	1048308.	284459.	259358.
	FITZ	0.	0.	21368.	21368.	6110.	67.	********	0.	59893.	40236.
CONTOUR MEAN		14.	14.	8410.	6574.	39180.	33070.	3560539.	2474894.	1588912.	1418218.
12	NMPW	0.	0.	0.	0.	********	0.	58605.	43987.	8482.	8482.
	NMPP	0.	0.	0.	0.	9173.	4374.	44006.	1583.	11418.	847.
	FITZ	0.	0.	54540.	54540.	11635.	5132.	********	0.	9409.	8329.
CONTOUR MEAN		0.	0.	18180.	18180.	10404.	1231.	51306.	7299.	9770.	866.
17	NMPW	0.	0.	123.	123.	********	0.	666.	168.	46944.	34509.
	NMPP	0.	0.	419.	419.	11119.	11119.	12752.	11479.	1767.	799.
	FITZ	0.	0.	2986.	2986.	2504.	854.	********	0.	2018.	1010.
CONTOUR MEAN		0.	0.	1176.	909.	6811.	4308.	6709.	6043.	16909.	15018.
CONTROL MEAN**		0.	0.	31.	31.	0.	0.	1627678.	1472118.	1159178.	1088203.
EXP. MEAN**		5.	5.	31808.	16973.	127772.	83456.	678787.	388506.	61494.	45476.
MONTHLY MEAN		3.	3.	21215.	11942.	127772.	83456.	1153232.	727245.	500567.	436705.
MONTHLY RANGE		0.-	41.	0.-	140876.	2504.-	680022.	666.-6035434.		1767.-4422385.	

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
******** SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

Table C-10

ABUNDANCE (NO./SQUARE MILLIMETER) OF SUSPENDED PERIPHYTON ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

CHLOROPHYTA

		MAY		JUN		JUL		AUG		SEP	
		2-25 MAY		25 MAY - 6 JUL		6-27 JUL		27 JUL - 2 SEP		2-30 SEP	
DEPTH CONTOUR	TRAN-SECT	MEAN	S.E.*	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
2	NMPW	803.	73.	575858.	143966.	********	0.	61537.	15856.	39841.	39841.
	NMPP	863.	24.	542933.	19683.	8463.	3251.	134434.	44457.	********	0.
	FITZ	4734.	4047.	593747.	178466.	31089.	17009.	********	0.	********	0.
CONTOUR MEAN		2133.	1301.	570845.	14888.	19776.	11313.	97985.	36449.	39841.	39841.
7	NMPW	3836.	3603.	160578.	4629.	********	0.	131506.	76135.	28640.	17282.
	NMPP	1739.	453.	19167.	7033.	15067.	14300.	73899.	29357.	11580.	2364.
	FITZ	13829.	13621.	12655.	8215.	4178.	632.	********	0.	23287.	15096.
CONTOUR MEAN		6468.	3730.	64133.	48259.	9622.	5445.	102702.	28804.	21169.	5037.
12	NMPW	1322.	13.	29307.	5933.	********	0.	13229.	4758.	942.	942.
	NMPP	1853.	596.	2285.	1624.	9204.	2795.	29990.	25797.	17502.	588.
	FITZ	922.	67.	177848.	3839.	3873.	1474.	********	0.	1641.	1366.
CONTOUR MEAN		1366.	270.	69813.	54577.	6538.	2666.	21609.	8389.	6695.	5407.
17	NMPW	363.	170.	7453.	3604.	********	0.	588.	120.	4900.	3430.
	NMPP	1478.	356.	2040.	569.	7210.	4164.	18551.	18509.	4689.	443.
	FITZ	754.	286.	10152.	198.	2078.	39.	********	0.	725.	224.
CONTOUR MEAN		865.	327.	6548.	2385.	4644.	2566.	9569.	8981.	3438.	1358.
CONTROL MEAN**		1581.	777.	193299.	131926.	0.	0.	51715.	29662.	18581.	9361.
EXP. MEAN**		3271.	1575.	170103.	89453.	10145.	3315.	64218.	26270.	9904.	3739.
MONTHLY MEAN		2708.	1079.	177835.	70624.	10145.	3315.	57967.	18493.	13375.	4284.
MONTHLY RANGE		363.-	13829.	2040.-	593747.	2078.-	31089.	588.-	134434.	725.-	39841.

* STANDARD ERROR

** CONTROL REPRESENTS NMPW: EXPERIMENTAL REPRESENTS NMPP & FITZ

********SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

Table C-11

ABUNDANCE (NO./SQUARE MILLIMETER) OF SUSPENDED PERIPHYTON ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

BACILLARIOPHYTA-CENTRIC

		MAY		JUN		JUL		AUG		SEP	
		2-25 MAY		25 MAY - 6 JUL		6-27 JUL		27 JUL - 2 SEP		2-30 SEP	
DEPTH CONTOUR	TRAN-SECT	MEAN	S.E.*	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.	MEAN	S.E.
2	NMPW	82.	82.	8306.	8306.	********	0.	5932.	2374.	0.	0.
	NMPP	278.	[illegible]4.	16260.	8657.	0.	0.	0.	0.	********	0.
	FITZ	3208.	3151.	8678.	1757.	0.	0.	********	0.	********	0.
CONTOUR MEAN		1189.	1011.	11081.	2592.	0.	0.	2966.	2966.	0.	0.
7	NMPW	416.	411.	0.	0.	********	0.	0.	0.	0.	0.
	NMPP	228.	126.	1655.	1103.	971.	864.	1638.	1638.	0.	0.
	FITZ	348[illegible].	3379.	79.	79.	416.	16.	********	0.	0.	0.
CONTOUR MEAN		1376.	1055.	578.	539.	693.	277.	819.	819.	0.	0.
12	NMPW	124.	124.	1847.	289.	********	0.	332.	332.	59.	59.
	NMPP	89.	89.	5543.	4882.	57.	57.	300.	300.	0.	0.
	FITZ	148.	148.	1299.	1299.	185.	58.	********	0.	376.	376.
CONTOUR MEAN		120.	17.	2896.	1333.	121.	64.	316.	16.	145.	117.
17	NMPW	72.	11.	347.	144.	********	0.	7.	7.	57.	57.
	NMPP	293.	14.	353.	19.	973.	973.	0.	0.	0.	0.
	FITZ	170.	24.	1688.	587.	250.	30.	********	0.	97.	97.
CONTOUR MEAN		179.	64.	796.	446.	612.	362.	4.	4.	51.	28.
CONTROL MEAN**		173.	82.	2625.	1936.	0.	0.	1568.	1457.	29.	17.
EXP. MEAN**		987.	516.	4444.	1981.	357.	143.	484.	391.	79.	61.
MONTHLY MEAN		716.	356.	3838.	1440.	357.	143.	1026.	728.	59.	37.
MONTHLY RANGE		72.-	3483.	0.-	16260.	0.-	973.	0.-	5932.	0.-	376.

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
********SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

Table C-12

ABUNDANCE (NO./SQUARE MILLIMETER) OF SUSPENDED PERIPHYTON ON ARTIFICIAL SUBSTRATES, NINE MILE POINT VICINITY, 1977

BACILLARIOPHYTA-PENNATE

DEPTH CONTOUR	TRAN-SECT	MAY 2-25 MAY MEAN	S.E.*	JUN 25 MAY - 6 JUL MEAN	S.E.	JUL 6-27 JUL MEAN	S.E.	AUG 27 JUL - 2 SEP MEAN	S.E.	SEP 2-30 SEP MEAN	S.E.
6	NMPW	3789.	1417.	2461236.	412516.	********	0.	20760.	4148.	168508.	156352.
	NMPP	2680.	855.	1001245.	111710.	0.	0.	103022.	19965.	********	0.
	FITZ	25196.	14775.	992365.	30299.	2631.	284.	********	0.	********	0.
CONTOUR MEAN		10555.	7327.	1484948.	488151.	1315.	1315.	61891.	41131.	168508.	168508.
7	NMPW	34418.	33779.	308911.	31665.	********	0.	48450.	20764.	425089.	217815.
	NMPP	1557.	157.	168370.	78462.	5570.	5442.	51281.	6084.	2451.	2451.
	FITZ	102787.	82497.	81059.	54103.	858.	57.	********	0.	116136.	79116.
CONTOUR MEAN		46254.	29816.	186113.	66371.	3214.	2356.	49865.	1416.	181226.	126271.
12	NMPW	2011.	807.	231462.	55264.	********	0.	11063.	1595.	2297.	2297.
	NMPP	704.	230.	123396.	7418.	7487.	1544.	9631.	7165.	506.	199.
	FITZ	5623.	2830.	213334.	20410.	2711.	888.	********	0.	4588.	3980.
CONTOUR MEAN		2780.	1471.	189398.	33413.	5099.	2388.	10347.	716.	2464.	1181.
17	NMPW	282.	155.	36540.	75.	********	0.	1041.	569.	5396.	3082.
	NMPP	872.	364.	12948.	1587.	5259.	1299.	5031.	4947.	166.	32.
	FITZ	2681.	455.	35415.	3262.	1759.	440.	********	0.	1103.	622.
CONTOUR MEAN		1278.	722.	28301.	7684.	3509.	1750.	3036.	1995.	2222.	1610.
CONTROL MEAN**		10125.	8129.	759537.	570119.	0.	0.	20328.	10202.	150323.	99475.
EXP. MEAN**		17763.	12483.	328516.	147659.	3284.	912.	42241.	22774.	20825.	19074.
MONTHLY MEAN		15217.	8561.	472190.	208281.	3284.	912.	31285.	12272.	72624.	43449.
MONTHLY RANGE		282.-	102787.	12948.-	2461236.	0.-	7487.	1041.-	103022.	166.-	425089.

* STANDARD ERROR

** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

********SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

Table C-13

ABUNDANCE (NO./SQUARE MILLIMETER) OF SUSPENDED PERIPHYTON COLLECTED ON ARTIFICIAL SUBSTRATES, NINE POINT VICINITY, 1977

LYNGBYA SP.

DEPTH CONTOUR	TRANSECT	MAY 2-25 MAY MEAN	S.E.*	JUN 25 MAY - 6 JUL MEAN	S.E.	JUL 6-27 JUL MEAN	S.E.	AUG 27 JUL - 2 SEP MEAN	S.E.	SEP 2-30 SEP MEAN	S.E.
2	NMPW	0.	0.	0.	0.	********	0.	406225.	358741.	156473.	51928.
	NMPP	0.	0.	0.	0.	680022.	357044.	1538141.	396115.	********	0.
	FITZ	0.	0.	0.	0.	229364.	11128.	********	0.	********	0.
CONTOUR	MEAN	0.	0.	0.	0.	454693.	2[illegible]5329.	972183.	565958.	156473.	156473.
7	NMPW	0.	0.	0.	0.	********	0.	6021591.	622922.	4420966.	4074563.
	NMPP	0.	0.	0.	0.	71601.	69727.	1085644.	1048308.	284459.	259358.
	FITZ	[illegible]	0.	0.	0.	5271.	276.	********	0.	59893.	40236.
CONTOUR	MEAN	0.	0.	0.	0.	38436.	33165.	3553617.	2467973.	1588439.	1417746.
12	NMPW	0.	0.	0.	0.	********	0.	38128.	29822.	7952.	7952.
	NMPP	0.	0.	0.	0.	7072.	3415.	29717.	14672.	8458.	3807.
	FITZ	0.	0.	0.	0.	11509.	5259.	********	0.	9409.	8329.
CONTOUR	MEAN	0.	0.	0.	0.	9291.	2218.	33923.	42[illegible].	8606.	427.
17	NMPW	0.	0.	0.	0.	********	0.	666.	168.	46944.	34509.
	NMPP	0.	0.	0.	0.	11119.	11119.	483.	483.	1530.	563.
	FITZ	0.	0.	0.	0.	1841.	797.	********	0.	1887.	879.
CONTOUR	MEAN	0.	0.	0.	0.	6480.	4639.	574.	91.	16787.	15079.
CONTROL MEAN**		0.	0.	0.	0.	0.	0.	1616652.	1471160.	1158083.	1088080.
EXP. MEAN**		0.	0.	0.	0.	127225.	83561.	663456.	385625.	60939.	45603.
MONTHLY MEAN		0.	0.	0.	0.	127225.	83561.	1140074.	726700.	499797.	436633.
MONTHLY RANGE		0.-	0.	0.-	0.	1841.-	680022.	483.-	6021591.	1530.-	4420966.

* STANDARD ERROR.
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
******** SAMPLE NOT TAKEN, SUBSTRATES LOST DURING SEVERE WEATHER

APPENDIX D

BENTHIC INVERTEBRATES

Table D-1

PERCENT RELATIVE ABUNDANCE OF BENTHIC INVERTEBRATES COLLECTED BY SUCTION SAMPLER DURING BIMONTHLY SAMPLING IN THE VICINITY OF NINE MILE POINT, 1977

	Collection Date				
Taxa	4-5 May	7-12 Jul	2-9 Sep	31 Oct - 2 Nov	Total
Coelenterata					
Hydrozoa					
Hydra sp.	2.3	1.4	T	1.7	1.2
Cordylophora lacustris	0.5	T	T	0.1	0.1
Platyhelminthes					
Turbellaria Unid.	0.3	1.1	0.5	1.8	1.0
Nemertea					
Prostoma sp.	0	0	0	0.2	0.1
Nematoda					
Nematoda Unid.	2.2	3.6	1.4	0.9	1.8
Annelida					
Polychaeta					
Manayunkia speciosa	22.2	1.7	1.5	12.7	7.8
Oligochaeta					
Naididae Unid.	0.1	12.1	0.6	0.4	2.7
Tubificidae Unid.	42.3	21.0	10.2	12.7	17.4
Hirudinae Unid.	0	0	0	T	T
Mollusca					
Gastropoda					
Ferrissia sp.	0	0	T	0.1	T
Lymnaea sp.	0.1	0.1	0.1	0.4	0.2
Amnicola sp.	0.7	0.5	0.3	1.1	0.6
Bitinia sp.	0.1	0	T	0	T
Amnicolidae Unid.	T	0	0	0	T
Physa sp.	0.1	0.4	0.9	0.8	0.7
Gyraulus sp.	0	T	T	T	T
Helisoma sp.	0	0	0.1	0.1	0.1
Goniobasis sp.	T	0.1	T	T	T
Pleurocera sp.	0	0	0.5	0.3	0.3
Valvata sp.	1.0	0.7	0.3	1.4	0.8
Pelecypoda					
Sphaerium sp.	1.6	1.0	0.2	0.9	3.1
Pisidium sp.	0.3	0.5	1.2	2.6	1.4
Lampsilis sp.	T	0	T	0	T
Arthropoda					
Arachnida					
Hydracarina Unid.	0.2	0.9	T	0.9	0.5
Isopoda					
Asellus militaris	T	0	0.1	T	T
Asellus sp.	0	T	0	T	T
Amphipoda					
Gammarus fasciatus	9.7	7.4	62.5	49.8	40.5
Pontoporeia affinis	12.5	38.5	9.1	8.7	15.3
Hyalella azteca	T	0	0	0	T
Amphipoda Unid.	0.5	0	0	0	T
Decapoda					
Orconectes propina	T	T	0	0	T
Astacidae Unid.	0	T	0	0	T
Ephemeroptera					
Stenonema sp.	T	T	0	T	T
Trichoptera					
Agraylea sp.	0	T	0	0	T
Athripsodes sp.	0	0.1	0	T	T
Diptera					
Chironomus sp.	0.1	1.4	7.3	0.3	3.0
Cryptochironomus sp.	1.2	1.2	0.5	1.0	0.9
Cricotopus sp.	0.7	1.8	T	T	0.5
Tanytarsus sp.	T	1.2	1.6	T	0.8
Dicrotendipes sp.	T	T	T	0	T
Polypedilum sp.	0	0.9	T	0.6	0.4
Microtendipes sp.	0	0.1	T	T	T
Procladius sp.	T	T	0.1	0.2	0.1
Parachironomus sp.	0	0.2	T	0	T
Glyptotendipes sp.	0	T	0	0	T
Harnischia sp.	0	0	T	0	T
Phaenopsectra sp.	0	T	0	0	T
Eukiefferiella sp.	T	0.1	0	0	T
Stictochironomus sp.	T	T	T	T	T
Tanypus sp.	0	0	T	0	T
Xenochironomus sp.	0	T	T	T	T
Psectrocladius sp.	0	0.2	T	0	T
Micropsectra sp.	0	0.2	0	0	T
Paratendipes sp.	0	T	0	0	T
Potthastia sp.	0.5	0	0	0.3	0.2
Heterotrissocladius sp.	0	0.1	0.3	0	0.1
Chironomidae Unid.	0.6	1.2	0.4	0	0.5
Bryozoa					
Plumatella rapens	0	0	T	T	T
Fredacella sultana	0	T	T	T	T
Paludicella articulata	0	0	0	T	T
Number Taxa	34	44	42	40	59

T = <0.1%

Table D-2

ABUNDANCE (NO./m^2) OF TOTAL BENTHIC INVERTEBRATES (ALL SPECIES COMBINED) COLLECTED BY SUCTION SAMPLER IN THE NINE MILE POINT VICINITY, 1977

TOTAL BENTHOS

DEPTH CONTOUR (FT)	TRAN-SECT	4-5 MAY MEAN	4-5 MAY S.E.*	7-12 JUL MEAN	7-12 JUL S.E.	7-9 SEP MEAN	7-9 SEP S.E.	31 OCT - 2 NOV MEAN	31 OCT - 2 NOV S.E.	DEC† MEAN	DEC† S.E.	YEARLY AVERAGE MEAN	YEARLY AVERAGE S.E.
10	NMPW	2563.3	535.5	2406.9	421.2	5301.2	1931.5	2897.3	881.5			3292.2	677.4
	NMPP	499.4	66.2	246.7	240.7	7536.5	2512.2	5665.2	1350.9			3486.9	1838.7
	FITZ	66.2	24.1	827.4	412.2	6844.6	352.0	3529.1	1194.4			2816.8	1534.4
	NMPE	99.3	33.1	640.8	340.0	9970.5	4031.5	2848.4	1161.3			3389.7	2272.7
	CONTOUR MEAN	807.06	593.6	1030.4	474.5	7413.5	972.1	3760.0	651.0			3246.4	148.6
20	NMPW	201.6	117.3	541.5	433.2	3490.0	794.3	3204.2	1886.4			1859.3	863.7
	NMPP	90.2	36.1	565.6	445.3	1600.6	198.6	3288.4	719.1			1386.2	708.1
	FITZ	692.0	469.3	2118.0	1612.6	3634.4	782.2	821.3	63.2			1816.4	686.2
	NMPE	54.1	60.0	580.7	141.4	222.6	132.4	382.1	27.1			309.9	112.4
	CONTOUR MEAN	259.5	147.5	951.5	388.9	2236.9	815.7	1924.0	768.9			1342.9	360.5
30	NMPW	779.2	610.7	273.8	69.2	436.2	75.2	3836.0	1531.4			1331.3	841.5
	NMPP	785.2	460.3	857.4	358.0	523.5	385.1	4663.3	1751.0			1707.4	987.9
	FITZ	442.3	69.2	1775.1	258.7	475.4	66.2	1486.2	114.3			1044.8	343.4
	NMPE	2783.0	27.1	3980.4	520.5	1970.6	15.0	1477.2	51.1			2552.8	546.7
	CONTOUR MEAN	1197.4	534.6	1721.7	813.8	851.4	373.5	2865.7	816.7			1659.1	327.3
40	NMPW	18.1	6.0	75.2	39.1	4708.4	3781.8	4016.5	2903.3			2204.5	1253.9
	NMPP	2647.6	1811.2	249.7	93.3	361.0	246.7	1471.2	1074.1			1182.4	560.9
	FITZ	379.1	228.6	2097.0	243.7	2743.8	1155.3	2939.4	460.3			2044.3	577.8
	NMPE	4455.7	646.8	4365.5	3.0	2304.6	216.6	2710.7	171.5			3459.1	555.8
	CONTOUR MEAN	1879.6	1036.4	1696.8	1000.2	2529.5	891.9	2784.5	522.2			2222.6	469.3
60	NMPW	39.1	9.0	568.6	358.0	1850.3	1393.0	108.3	42.1			641.5	419.6
	NMPP	81.2	39.1	532.5	183.5	722.1	306.9	261.7	99.3			399.3	142.0
	FITZ	2963.4	169.5	5562.9	1681.8	2331.7	3.0	4669.3	667.9			3881.8	746.8
	NMPE	3053.7	3.0	5529.8	192.5	3171.1	505.4	3273.4	150.4			3757.0	592.6
	CONTOUR MEAN	1534.4	851.4	3048.5	1442.2	2018.8	511.2	2078.2	1130.0			2169.9	953.9
CONTROL MEAN**		1404.7	520.9	1896.3	639.1	3342.5	900.9	2475.4	431.4			2279.7	388.0
EXP. MEAN**		866.5	333.4	1483.2	506.9	2677.4	829.0	2879.5	575.0			1976.6	350.5
MONTHLY MEAN		1135.6	307.3	1689.9	399.8	3009.9	1137.1	2677.5	382.7			2128.2	256.8
MONTHLY RANGE		18.1-4455.7		75.2-5562.9		222.6-9970.5		108.3-5665.2				309.9-3881.8	

*STANDARD ERROR

**CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ.

†NO SAMPLE TAKEN OWING TO BAD WEATHER.

Table D-3

ABUNDANCE (NO./m^2) AMPHIPODA COLLECTED BY SUCTION SAMPLER, NINE MILE POINT VICINITY, 1977

AMPHIPODA

DEPTH CONTOUR	TRAN-SECT	MAY MEAN	MAY S.E.*	JUL MEAN	JUL S.E.	SEP MEAN	SEP S.E.	OCT MEAN	OCT S.E	DEC*** MEAN	DEC*** S.E.
10	NMPW	1338.8	45.1	827.4	63.2	5274.1	1922.5	2530.2	610.8		
	NMPP	3.0	3.0	0.0	0.0	7428.2	2518.2	4883.0	1074.1		
	FITZ	30.1	30.1	228.7	84.2	6718.2	340.0	3453.9	1167.3		
	NMPE	12.0	12.0	114.3	84.2	9750.9	4088.7	2894.3	1149.3		
CONTOUR MEAN		346.0	331.0	292.6	184.3	7292.9	933.9	3440.3	517.0		
20	NMPW	90.3	60.2	81.2	69.2	3125.9	851.4	2728.8	1802.2		
	NMPP	24.1	24.1	270.8	198.6	1278.7	15.0	1630.7	180.5		
	FITZ	189.5	27.1	315.9	105.3	2662.6	484.4	770.2	66.2		
	NMPE	9.0	3.0	306.9	114.3	192.6	126.4	309.9	33.1		
CONTOUR MEAN		78.2	41.1	243.7	55.0	1814.9	668.1	1359.9	532.1		
30	NMPW	72.2	72.2	117.3	93.3	81.2	9.0	2494.1	1657.7		
	NMPP	243.7	111.3	234.7	96.3	385.1	288.8	658.9	490.4		
	FITZ	192.6	90.3	1380.9	261.7	132.4	6.0	1122.2	141.4		
	NMPE	300.9	150.4	1131.2	186.5	818.3	126.4	481.4	72.2		
CONTOUR MEAN		202.3	48.7	716.0	316.8	354.3	168.3	1189.1	455.5		
40	NMPW	12.0	0.0	30.1	18.1	51.1	27.1	743.1	129.4		
	NMPP	114.3	72.2	63.2	27.1	105.3	81.2	565.6	439.3		
	FITZ	138.4	18.1	1107.2	234.7	749.1	171.5	1681.8	255.7		
	NMPE	607.7	144.4	2819.1	183.5	968.8	12.0	758.2	6.0		
CONTOUR MEAN		218.1	132.7	1004.9	654.4	468.6	230.1	937.2	252.0		
60	NMPW	12.0	0.0	45.1	33.1	30.1	30.1	57.2	27.1		
	NMPP	30.1	18.1	117.3	69.2	186.5	90.3	132.4	84.2		
	FITZ	761.2	189.5	3231.2	1077.1	1368.9	358.0	1859.3	234.7		
	NMPE	950.7	36.1	3083.8	135.4	1841.3	48.1	1591.6	346.0		
CONTOUR MEAN		438.5	244.1	1619.4	888.7	856.7	443.9	910.1	474.1		
CONTROL MEAN**		340.6	149.4	855.6	368.6	2213.4	992.9	1458.9	352.0		
EXP. MEAN**		172.7	70.6	695.0	317.0	2101.5	866.2	1675.8	462.5		
MONTHLY MEAN		256.6	82.7	775.3	237.3	2157.5	641.3	1567.3	475.6		
MONTHLY RANGE		3.0- 1338.8		0.0- 3231.2		30.1- 9750.9		57.2- 4883.0			

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
*** SAMPLES NOT TAKEN OWING TO BAD WEATHER CONDITIONS

Table D-4

ABUNDANCE (No./m^2) OF <u>GAMMARUS FASCIATUS</u> COLLECTED BY SUCTION SAMPLER, NINE MILE POINT VICINITY, 1977

Depth Contour (ft)	Transect	4-5 May	7-12 Jul	2-9 Sep	31 Oct - 2 Nov	Dec†
10	NMPW	1339	824	5274	2530	
	NMPP	3	T	7428	4883	
	FITZ	30	229	6718	3454	
	NMPE	12	114	9751	2894	
	Contour Mean	346	292	7293	3440	
20	NMPW	90	75	3108	2729	
	NMPP	24	271	1279	1631	
	FITZ	81	187	2663	698	
	NMPE	6	48	96	247	
	Contour Mean	50	145	1786	1326	
30	NMPW	72	105	66	2491	
	NMPP	244	229	382	659	
	FITZ	45	30	21	644	
	NMPE	9	21	199	126	
	Contour Mean	93	96	167	980	
40	NMPW	12	30	48	722	
	NMPP	114	60	105	566	
	FITZ	21	114	57	1131	
	NMPE	27	9	111	199	
	Contour Mean	44	53	80	654	
60	NMPW	12	T	15	57	
	NMPP	9	90	177	132	
	FITZ	51	24	57	340	
	NMPE	3	42	87	566	
	Contour Mean	19	39	84	274	
Control Mean*		158.2	126.8	1,875.5	1,256.1	
Experimental Mean*		62.2	123.4	1,888.7	1,413.8	
Monthly Mean		110	125	1,882	1,335	
Monthly Range		3-1339	0-824	15-9751	57-4883	

*Control represents NMPW and NMPE, Experimental represents NMPP and FITZ.

†Samples not taken owing to bad weather.

T = trace, <0.5.

Table D-5

ABUNDANCE (No./m^2) OF PONTOPOREIA AFFINIS COLLECTED BY SUCTION SAMPLER, NINE MILE POINT VICINITY, 1977

Depth Contour (ft)	Transect	4-5 May	7-12 Jul	2-9 Sep	31 Oct - 2 Nov	Dec†
10	NMPW	0	3	0	0	
	NMPP	0	T	0	0	
	FITZ	0	T	0	0	
	NMPE	0	T	0	0	
	Contour Mean	—	1	—	—	
20	NMPW	T	6	18	T	
	NMPP	T	T	T	T	
	FITZ	T	129	T	72	
	NMPE	3	259	96	63	
	Contour Mean	1	99	29	34	
30	NMPW	T	12	15	3	
	NMPP	T	6	3	T	
	FITZ	147	1351	111	478	
	NMPE	292	1110	620	355	
	Contour Mean	111	620	187	209	
40	NMPW	T	T	3	21	
	NMPP	T	3	T	T	
	FITZ	117	993	692	551	
	NMPE	578	2810	857	560	
	Contour Mean	174	951	388	283	
60	NMPW	T	45	15	T	
	NMPP	21	27	9	T	
	FITZ	707	3207	1312	1519	
	NMPE	948	3042	1754	1026	
	Contour Mean	419	1580	772	636	
Control Mean*		182.1	728.7	337.8	202.8	
Experimental Mean*		99.2	571.6	212.7	262.0	
Monthly Mean		141	650	275	232	
Monthly Range		0-948	0-3207	0-1754	0-1519	

* Control represents NMPW and NMPE, Experimental represents NMPP and FITZ.

† Samples not taken owing to bad weather.

T = trace, <0.5

Table D-6

ABUNDANCE (No./m^2) POLYCHAETA COLLECTED BY SUCTION SAMPLER, NINE MILE POINT VICINITY, 1977

POLYCHAETA

DEPTH CONTOUR	TRAN-SECT	MAY MEAN	MAY S.E.*	JUL MEAN	JUL S.E.	SEP MEAN	SEP S.E.	OCT MEAN	OCT S.E.	DEC*** MEAN	DEC*** S.E.
10	NMPW	875.5	574.6	9.0	3.0	15.0	15.0	183.5	183.5		
	NMPP	0.0	0.0	0.0	0.0	0.0	0.0	541.5	222.6		
	FITZ	3.0	3.0	0.0	0.0	9.0	9.0	0.0	0.0		
	NMPE	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0		
CONTOUR MEAN		221.1	218.1	2.3	2.3	6.0	3.7	181.3	127.6		
20	NMPW	90.3	66.2	60.2	54.2	60.2	18.1	96.3	72.2		
	NMPP	27.1	15.0	24.1	24.1	15.0	15.0	1019.9	779.2		
	FITZ	442.3	442.3	114.3	108.3	607.7	222.6	0.0	0.0		
	NMPE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
CONTOUR MEAN		139.9	102.5	49.6	24.9	170.7	146.2	279.0	248.0		
30	NMPW	698.0	535.5	6.0	6.0	93.3	63.2	1010.9	6.0		
	NMPP	388.1	219.6	315.9	117.3	69.2	51.1	3474.9	995.8		
	FITZ	0.0	0.0	6.0	6.0	0.0	0.0	0.0	0.0		
	NMPE	9.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0		
CONTOUR MEAN		273.8	167.8	82.0	78.0	40.6	24.0	1121.5	819.9		
40	NMPW	0.0	0.0	0.0	0.0	0.0	0.0	409.2	367.0		
	NMPP	2458.0	1808.2	18.1	18.1	30.1	30.1	3.0	3.0		
	FITZ	6.0	6.0	0.0	0.0	0.0	0.0	3.0	3.0		
	NMPE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
CONTOUR MEAN		616.0	614.0	4.5	4.5	7.5	7.5	103.8	101.8		
60	NMPW	0.0	0.0	0.0	0.0	0.0	0.0	3.0	3.0		
	NMPP	12.0	12.0	6.0	0.0	0.0	0.0	0.0	0.0		
	FITZ	6.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0		
	NMPE	12.0	6.0	24.1	18.1	12.0	12.0	90.3	42.1		
CONTOUR MEAN		7.5	2.9	7.5	5.7	3.0	3.0	23.3	22.3		
CONTROL MEAN**		169.1	104.1	9.9	6.1	18.1	10.2	179.3	101.0		
EXP. MEAN**		334.3	242.0	48.4	31.7	73.1	59.8	504.2	347.5		
MONTHLY MEAN		251.7	129.6	29.2	16.3	45.6	30.2	341.8	199.5		
MONTHLY RANGE		0.0- 2458.0		0.0- 315.9		0.0- 607.7		0.0- 3474.9			

* STANDARD ERROR
** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ
*** SAMPLES NOT TAKEN OWING TO BAD WEATHER CONDITIONS

Table D-7

ABUNDANCE (No./m^2) OLIGOCHAETA COLLECTED BY SUCTION SAMPLER, NINE MILE POINT VICINITY, 1977

OLIGOCHAETA

DEPTH CONTOUR	TRAN-SECT	MAY MEAN	MAY S.E.*	JUL MEAN	JUL S.E.	SEP MEAN	SEP S.E	OCT MEAN	OCT S.E	DEC*** MEAN	DEC*** S.E.
10	NMPW	132.4	54.2	923.6	225.6	3.0	3.0	6.0	0.0		
	NMPP	3.0	3.0	186.5	180.5	0.0	0.0	0.0	0.0		
	FITZ	18.1	6.0	406.2	243.7	0.0	0.0	27.1	15.0		
	NMPE	15.0	9.0	291.8	225.6	6.0	0.0	0.0	0.0		
CONTOUR MEAN		42.1	30.3	452.0	163.5	2.3	1.4	8.3	6.4		
20	NMPW	6.0	6.0	340.0	285.8	66.2	6.0	3.0	3.0		
	NMPP	0.0	0.0	165.5	135.4	63.2	39.1	0.0	0.0		
	FITZ	0.0	0.0	1080.1	959.7	99.3	51.1	30.1	0.0		
	NMPE	3.0	3.0	21.1	21.1	6.0	6.0	21.1	3.0		
CONTOUR MEAN		2.3	1.4	401.6	235.4	58.7	19.4	13.5	7.2		
30	NMPW	3.0	3.0	0.0	0.0	45.1	27.	24.1	24.1		
	NMPP	3.0	3.0	15.0	15.0	0.0	0.	63.2	45.1		
	FITZ	168.5	24.1	216.6	30.1	183.5	51.	117.3	45.1		
	NMPE	2319.6	105.3	2154.2	601.7	679.9	144.	652.9	177.5		
CONTOUR MEAN		623.5	566.7	596.5	521.6	227.1	155.	214.4	147.4		
40	NMPW	0.0	0.0	12.0	12.0	1402.0	1384.	2160.2	2154.2		
	NMPP	3.0	3.0	3.0	3.0	3.0	3.	403.2	403.2		
	FITZ	27.1	3.0	830.4	54.2	1510.3	1179.	740.1	24.1		
	NMPE	3162.0	1044.0	1041.0	234.7	779.2	370.	655.9	6.0		
CONTOUR MEAN		798.0	788.0	471.6	271.4	923.6	346.	989.8	396.6		
60	NMPW	6.0	0.0	222.6	120.3	445.3	403.	27.1	9.0		
	NMPP	33.1	27.1	228.7	162.5	162.5	138.	18.1	18.1		
	FITZ	1865.3	132.4	1432.1	529.5	607.7	270.	1371.9	361.0		
	NMPE	1874.4	27.1	1594.6	288.8	421.2	36.	701.0	147.4		
CONTOUR MEAN		944.7	534.2	869.5	373.2	409.2	92.	529.5	328.1		
CONTROL MEAN**		752.2	383.7	660.1	236.0	385.4	146.	425.1	216.2		
EXP. MEAN**		212.1	184.4	456.4	154.6	263.0	150.	277.1	143.3		
MONTHLY MEAN		482.1	216.3	558.2	139.3	324.2	103.	351.1	185.7		
MONTHLY RANGE		0.0- 3162.0		0.0- 2154.2		0.0- 1510.3		0.0- 2160.2			

* STANDARD ERROR

** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

*** SAMPLES NOT TAKEN OWING TO BAD WEATHER CONDITIONS

Table D-8

ABUNDANCE (No./m^2) OF DIPTERA COLLECTED BY SUCTION SAMPLER, NINE MILE POINT VICINITY, 1977

DIPTERA

DEPTH CONTOUR	TRAN-SECT	MAY MEAN	MAY S.E.*	JUL MEAN	JUL S.E.	SEP MEAN	SEP S.E.	OCT MEAN	OCT S.E	DEC*** MEAN	DEC*** S.E.
10	NMPW	69.2	27.1	457.3	30.1	0.0	0.0	0.0	0.0		
	NMPP	12.0	6.0	57.2	57.2	6.0	6.0	0.0	0.0		
	FITZ	6.0	6.0	183.5	93.3	0.0	0.0	3.0	3.0		
	NMPE	54.2	6.0	216.6	18.1	6.0	0.0	9.0	9.0		
CONTOUR MEAN		35.4	15.6	228.7	83.6	3.0	1.7	3.0	2.1		
20	NMPW	0.0	0.0	18.1	12.0	120.3	18.1	0.0	0.0		
	NMPP	27.1	9.0	21.1	21.1	33.1	33.1	3.0	3.0		
	FITZ	24.1	24.1	433.2	312.9	36.1	12.0	12.0	6.0		
	NMPE	27.1	3.0	186.5	6.0	21.1	15.0	48.1	6.0		
CONTOUR MEAN		19.6	6.6	164.7	97.8	52.7	22.8	15.8	11.1		
30	NMPW	3.0	3.0	42.1	30.1	78.2	30.1	3.0	3.0		
	NMPP	30.1	12.0	78.2	18.1	15.0	9.0	0.0	0.0		
	FITZ	24.1	12.0	96.3	0.0	63.2	3.0	123.4	3.0		
	NMPE	75.2	3.0	198.6	18.1	42.1	6.0	66.2	6.0		
CONTOUR MEAN		33.1	15.2	103.8	33.5	49.6	13.7	48.1	29.3		
40	NMPW	3.0	3.0	3.0	3.0	3168.1	2452.0	367.0	361.0		
	NMPP	69.2	69.2	12.0	6.0	27.1	15.0	9.0	9.0		
	FITZ	21.1	15.0	123.4	27.1	84.2	42.1	114.3	12.0		
	NMPE	189.5	57.2	219.6	69.2	120.3	30.1	54.2	0.0		
CONTOUR MEAN		70.7	42.0	89.5	51.3	849.9	772.9	136.1	79.9		
60	NMPW	0.0	0.0	255.7	189.5	1341.8	1016.9	0.0	0.0		
	NMPP	3.0	3.0	147.4	51.1	327.9	87.2	0.0	0.0		
	FITZ	39.1	3.0	141.4	15.0	117.3	27.1	240.7	72.2		
	NMPE	51.1	9.0	96.3	30.1	535.5	379.1	234.7	24.1		
CONTOUR MEAN		23.3	12.8	160.2	33.8	580.7	267.7	118.8	68.6		
CONTROL MEAN**		47.2	18.4	169.4	43.3	543.4	319.9	78.2	39.2		
EXP. MEAN**		25.6	6.0	129.4	38.0	71.0	30.8	50.5	26.0		
MONTHLY MEAN		36.4	9.7	149.4	28.4	307.2	165.5	64.4	26 9		
MONTHLY RANGE		0.0-	189.5	3.0-	457.3	0.0-	3168.1	0.0-	367.0		

* STANDARD ERROR

** CONTROL REPRESENTS NMPW & NMPE, EXPERIMENTAL REPRESENTS NMPP & FITZ

*** SAMPLES NOT TAKEN OWING TO BAD WEATHER CONDITIONS

APPENDIX E

ICHTHYOPLANKTON

Table E-1

ABUNDANCE[1] OF TOTAL EGGS IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
APR 10	S	No Samples Taken Due to Weather							0	No Samples Taken Except Surface and Mid-depth at 3-West Due to Weather						No Samples Taken Due to Weather			
	M								0										
	B																		
	MEAN								0.0										
APR 15-16	S, M, B, MEAN	No Catch							No Catch							No Catch			
APR 18	S, M, B, MEAN	No Catch							No Catch							No Catch			
APR 30-MAY 1	S, M, B, MEAN	No Catch							No Catch							No Catch			
MAY 3	S, M, B, MEAN	No Catch							No Catch							No Catch			
MAY 11	S, M, B, MEAN	No Catch							No Catch							No Catch			
MAY 16	S, M, B, MEAN	No Catch							No Catch							No Catch			
MAY 23	S	0	0	0	0.0	5352.3	0	892.1	0	0	0	98.0	9.8	0	18.0	0	30.4	0	366.0
	M	0	0	0	32.3	0.0	0	5.4	0	0	0	0.0	0.0	0	0	0	0.0	0	2.2
	B	0	0	0	4.8	0.0	0	0.8	0	0	0	0.0	0.0	0	0	0	0.0	0	0.3
	MEAN	0	0	0	12.4	1784.1	0	299.4	0	0	0	32.7	3.3	0	6.0	0	10.1	0	122.8
MAY 31	S	0	0	0.0	9.9	0	0	1.7	0	0	0	3.8	0	0	0.6	No Catch			0.9
	M	0	0	3.2	0.0	0	0	0.5	0	0	0	0.0	0	0	0				0.2
	B	0	0	0.0	0.0	0	0	0	0	0	0	0.0	0	0	0				0
	MEAN	0	0	1.1	3.3	0	0	0.7	0	0	0	1.3	0	0	0.2				0.4

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-2

ABUNDANCE[1] OF TOTAL EGGS IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No fish eggs were collected in day samples after Jul 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11	S	0	5.0	0	0.0	0	0	0.8	No Catch						0.0	No Catch			0.3
	M	0	0.0	0	0.0	0	0	0							0.0				0.0
	B	0	0.0	0	4.1	0	0	0.7							0.0				0.3
	MEAN	0	1.7	0	1.4	0	0	0.5							0.0				0.2
JUN 14	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUN 20	S	0	0.0	0	0	0	0	0	5.5	0	0	0	0	0	0.9	No Catch			0.4
	M	0	3.6	0	0	0	0	0.6	0.0	0	0	0	0	0	0				0.2
	B	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0	0				0.0
	MEAN	0	1.2	0	0	0	0	0.2	1.8	0	0	0	0	0	0.3				0.2
JUN 27	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUL 9	S	4.4	0	0	0.0	0	0	0.7	0	4.1	0	0	0	0	0.7	No Catch			0.6
	M	0.0	0	0	4.8	0	0	0.8	0	0.0	0	0	0	0	0.0				0.3
	B	4.5	0	0	0.0	0	0	0.8	0	0.0	0	0	0	0	0.0				0.3
	MEAN	3.0	0	0	1.6	0	0	0.8	0	1.4	0	0	0	0	0.2				0.4
JUL 13-15	S	56.6	99.8	181.0	0	4.7	0.0	57.0	43.9	204.8	255.4	0	0	0	84.0	0	432.1	0.0	85.2
	M	0.0	0.0	0.0	0	0.0	4.9	0.8	0.0	0.0	20.2	0	0	0	3.4	0	6.6	0.0	2.1
	B	0.0	81.4	9.4	0	0.0	0.0	15.1	4.5	0.0	0.0	0	0	0	0.8	0	0.0	8.3	6.9
	MEAN	18.9	60.4	63.5	0	1.6	1.6	24.3	16.1	68.3	91.9	0	0	0	29.4	0	146.2	2.8	31.4
JUL 18	S	0.0	11.5	0	4.3	0.0	0.0	2.6	0.0	0	0.0	0	0.0	12.1	2.0	13.4	0	0	2.8
	M	5.0	0.0	0	0.0	0.0	0.0	0.8	4.3	0	0.0	0	0.0	4.9	1.5	0.0	0	0	0.9
	B	0.0	8.4	0	0.0	4.4	24.9	6.3	0.0	0	3.8	0	4.8	0.0	1.4	3.8	0	0	3.3
	MEAN	1.7	6.6	0	1.4	1.5	8.3	3.3	1.4	0	1.3	0	1.6	5.7	1.7	5.7	0	0	2.4
JUL 28-29	S	No Catch							0	0	0	0	3.7	0	0.6	No Catch			0.2
	M								0	0	0	0	0.0	0	0.0				0.0
	B								0	0	0	0	0.0	0	0.0				0.0
	MEAN								0	0	0	0	1.2	0	0.2				0.1

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-3

ABUNDANCE[1] OF TOTAL EGGS IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No fish eggs were collected in night samples after Jul 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11-12	S M B MEAN	No Catch							No Catch							No Catch			
JUN 13-14	S	0	0	0	0	0	0.0	0	0.0	0	0	0	0	0	0	No Catch			0
	M	0	0	0	0	0	0.0	0	6.7	0	0	0	0	0	1.1				0.4
	B	0	0	0	0	0	3.2	0.5	0.0	0	0	0	0	0	0				0.2
	MEAN	0	0	0	0	0	1.1	0.2	2.2	0	0	0	0	0	0.4				0.2
JUN 22-23	S	38.1	0	0	0	0	0	6.4	104.9	0.0	0	0	0	4.0	18.2	No Catch			9.8
	M	0.0	0	0	0	0	0	0	0.0	3.4	0	0	0	0.0	0.6				0.2
	B	0.0	0	0	0	0	0	0	0.0	0.0	0	0	0	0.0	0				0
	MEAN	12.7	0	0	0	0	0	2.1	35.0	1.1	0	0	0	1.4	6.2				3.3
JUN 27-28	S	0	0	0	0	4.4	13.2	2.9	4.3	0	0.0	0	0.0	0	0.7	0	0	0.0	1.5
	M	0	0	0	0	0.0	0.0	0	0.0	0	191.7	0	0.0	0	32.0	0	0	0.0	12.8
	B	0	0	0	0	0.0	0.0	0	0.0	0	0.0	0	3.6	0	0.6	0	0	6.5	0.7
	MEAN	0	0	0	0	1.5	4.4	1.0	1.4	0	63.9	0	1.2	0	11.1	0	0	2.2	5.0
JUL 7	S	396.8	2630.6	0	0	0	336.8	560.7	757.0	0	0	0	0	0	126.2	9.7	0	0	275.3
	M	55.0	0.0	0	0	0	3.6	9.8	0.0	0	0	0	0	0	0	0.0	0	0	3.9
	B	0.0	49.0	0	0	0	0.0	8.2	0.0	0	0	0	0	0	0	0.0	0	0	3.3
	MEAN	150.6	893.2	0	0	0	113.5	192.9	252.4	0	0	0	0	0	42.1	3.2	0	0	94.2
JUL 14-15	S	1795.1	7034.2	206.5	691.2	421.6	4.9	1692.2	2881.4	18.9	65.8	303.6	349.6	0.0	603.2	41.0	36.8	0	923.4
	M	181.9	2554.4	146.8	186.7	157.7	57.7	547.6	694.4	33.2	75.5	0.0	230.6	20.5	175.7	15.3	0.0	0	290.3
	B	15.2	1712.0	428.5	50.2	124.5	243.0	428.9	568.9	30.6	103.7	14.7	166.4	246.6	188.5	12.4	0.0	0	247.8
	MEAN	664.1	3766.9	260.6	309.4	234.6	101.9	889.6	1381.6	27.6	81.7	106.1	248.9	89.0	322.5	22.9	12.3	0	487.2
JUL 18-19	S	1138.8	1423.4	1107.8	420.1	1096.1	128.3	885.8	933.9	542.0	12.1	212.4	86.1	3.9	298.4	62.2	0.0	21.4	479.2
	M	450.3	7068.7	3755.6	2737.6	896.2	335.6	2540.7	1271.2	1631.8	61.6	22.4	173.8	32.0	532.1	356.6	90.4	6.8	1259.4
	B	1574.1	4937.0	12,848.4	72.9	1849.8	500.0	3630.4	857.0	636.6	114.0	142.1	321.2	37.6	351.4	96.2	49.1	0.0	1602.4
	MEAN	1054.4	4476.4	5903.9	1076.8	1280.7	321.3	2352.3	1020.7	936.8	62.6	125.6	193.7	24.5	394.0	171.6	46.5	9.4	1113.7
JUL 28-29	S	0	6.6	101.5	7.1	0	0.0	19.2	0	0	13.5	0	0	0.0	2.3	0.0	0	0	8.6
	M	0	7.2	0.0	168.3	0	0.0	29.3	0	0	47.1	0	0	0.0	7.9	27.7	0	0	16.7
	B	0	119.4	469.9	11.4	0	36.0	106.1	0	0	166.7	0	0	3.4	28.4	0.0	0	0	53.8
	MEAN	0	44.4	190.4	62.3	0	12.0	51.5	0	0	75.8	0	0	1.1	12.8	9.2	0	0	26.3

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-4

ABUNDANCE[1] OF ALEWIFE EGGS IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No alewife eggs were collected in day samples during Apr, May and Jun and after Jul 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11	S[2]	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUN 14	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUN 20	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUN 27	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUL 9	S	0	0	0	0	0	0	.0	0	4.1	0	0	0	0	.7	No Catch			.3
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	B	4.5	0	0	0	0	0	.7	0	0	0	0	0	0	0				.3
	MEAN	1.5	0	0	0	0	0	0.2	0	1.4	0	0	0	0	0.2				.2
JUL 13-15	S	56.6	99.8	181.0	0	4.7	0	57.0	43.9	199.9	246.1	0	0	0	81.7	0	432.1	0	84.3
	M	0	0	0	0	0	4.9	.8	0	0	16.2	0	0	0	2.7	0	3.3	0	1.6
	B	0	81.4	9.5	0	0	0	15.2	4.5	0	0	0	0	0	.8	0	0	4.2	6.6
	MEAN	18.9	60.4	63.5	0	1.5	1.6	24.3	16.1	66.6	87.4	0	0	0	28.4	0	145.1	1.4	30.8
JUL 18	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No Catch			0
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	B	0	4.2	0	0	4.4	24.9	5.6	0	0	0	0	4.8	0	.8				2.6
	MEAN	0	1.4	0	0	1.5	8.3	1.9	0	0	0	0	1.6	0	0.3				.9
JUL 28-29	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-5

ABUNDANCE[1] OF ALEWIFE EGGS IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No alewife eggs were collected in night samples after Jul 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	20-FT 1-WEST	20-FT 1/2-WEST	20-FT 1/2-EAST	20-FT 1-EAST	20-FT 3-EAST	20-FT MEAN	40-FT CONTOUR[3] 3-WEST	40-FT 1-WEST	40-FT 1/2-WEST	40-FT 1/2-EAST	40-FT 1-EAST	40-FT 3-EAST	40-FT MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11-12	S[2] M B MEAN	No Catch							No Catch							No Catch			
JUN 13-14	S M B MEAN	No Catch							No Catch							No Catch			
JUN 22-23	S M B MEAN	No Catch							No Catch							No Catch			
JUN 27-28	S M B MEAN	No Catch							0 0 0 0	0 0 0 0	0 191.7 0 63.9	0 0 0 0	0 0 3.6 1.2	0 0 0 0	0 31.9 0.6 10.8	0 0 0 0	0 0 0 0	0 0 6.5 2.2	0 12.8 0.7 4.5
JUL 7	S M B MEAN	396.8 55.0 0 150.6	2630.6 0 49.0 893.2	0 0 0 0	0 0 0 0	0 0 0 0	336.9 3.6 0 113.5	560.7 9.8 8.2 192.9	757.0 0 0 252.4	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	126.2 0 0 42.1	9.7 0 0 3.2	0 0 0 0	0 0 0 0	275.4 3.9 3.3 94.2
JUL 14-15	S M B MEAN	1795.1 181.9 15.2 654.1	7034.2 2554.4 1712.0 3766.9	206.5 146.8 428.5 260.6	691.2 167.1 50.2 302.8	421.7 157.7 124.5 234.6	4.9 57.7 243.0 101.9	1692.3 544.3 428.9 888.5	2881.4 694.4 568.9 1381.6	18.9 33.2 30.6 27.6	65.8 75.5 103.7 81.7	303.6 0 14.7 106.1	349.6 230.6 166.4 248.9	0 20.5 246.6 89.0	603.2 175.7 188.5 322.5	15.4 15.3 12.4 14.4	36.8 0 0 12.3	0 0 0 0	921.7 289.0 247.8 486.2
JUL 18-19	S M B MEAN	1134.6 450.3 1574.1 1053.0	1423.3 7068.7 4937.0 4476.4	1107.8 3755.6 12848.4 5903.9	420.1 2737.6 72.9 1076.8	1096.1 896.2 1849.8 1280.7	128.3 335.6 500.0 321.3	885.0 2540.7 3630.4 2352.0	933.9 1271.2 857.0 1020.7	542.0 1631.8 636.6 936.8	12.1 61.6 114.0 62.6	212.4 22.4 142.1 125.6	86.1 173.8 321.2 193.7	3.9 32.0 37.6 24.5	298.4 532.1 351.4 394.0	58.5 356.6 96.2 170.4	0 90.4 49.1 46.5	21.4 6.8 0 9.4	478.7 1259.4 1602.4 1113.5
JUL 28-29	S M B MEAN	0 0 0 0	6.6 7.2 119.4 44.4	101.5 0 469.9 190.4	7.1 168.3 11.4 62.3	0 0 0 0	0 0 36.0 12.0	19.2 29.3 106.1 51.5	0 0 0 0	0 0 0 0	13.5 47.1 166.7 75.8	0 0 0 0	0 0 0 0	0 0 3.4 1.1	2.3 7.9 28.4 12.8	0 27.7 0 9.2	0 0 0 0	0 0 0 0	8.6 16.7 53.8 26.3

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-6

ABUNDANCE[1] OF TOTAL PROLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
APR 10	S	No Samples Taken Due to Weather							0	No Samples Taken Except Surface and Mid-depth at 3-West Due to Weather						No Samples Taken			
	M								0										
	B																		
	MEAN								0.0										
APR 15-16	S	0.0	0.0	0.0	0.0	1.8	3.6	0.9	0	0	0	0	0.0	0	0	No Catch			0.4
	M	19.8	0.0	21.6	7.3	4.1	5.2	9.7	0	0	0	0	0.0	0	0				3.9
	B	0.0	3.2	2.4	0.0	1.8	0.0	1.2	0	0	0	0	20.2	0	3.4				1.8
	MEAN	6.6	1.1	8.0	2.4	2.6	2.9	3.9	0	0	0	0	6.7	0	1.1				2.0
APR 18	S	0	0	0	5.4	0.0	0	0.9	0	0	0	0.0	0	0.0	0	No Catch			0.4
	M	0	0	0	0.0	0.0	0	0	0	0	0	0.0	0	0.0	0				0
	B	0	0	0	0.0	3.0	0	0.5	0	0	0	3.5	0	3.3	1.1				0.6
	MEAN	0	0	0	1.8	1.0	0	0.5	0	0	0	1.2	0	1.1	0.4				0.3
APR 30-MAY 1	S	3.8	4.7	0	0.0	0.0	3.1	1.9	0.0	7.2	5.0	25.5	0.0	0.0	6.3	0.0	0	0	5.3
	M	3.8	8.4	0	6.3	0.0	6.2	4.1	0.0	11.8	3.2	0.0	5.6	6.0	4.4	18.4	0	0	4.6
	B	4.4	2.5	0	0.0	11.7	3.0	3.6	3.3	0.0	1.8	1.8	2.6	0.0	1.6	6.8	0	0	2.5
	MEAN	4.0	5.2	0	2.1	3.9	4.1	3.2	1.1	6.3	3.3	9.1	2.7	2.0	4.1	8.4	0	0	3.5
MAY 3	S	21.4	30.5	10.2	48.1	22.8	12.4	24.2	4.4	18.2	0	30.6	4.3	0	9.6	24.5	0.0	0	15.2
	M	0.0	0.0	4.5	4.6	0.0	3.8	2.2	0.0	0.0	0	0.0	0.0	0	0	0.0	3.1	0	1.1
	B	4.6	4.8	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0	0.0	0.0	0	0	0.0	0.0	0	0.6
	MEAN	8.6	11.8	4.9	17.6	7.6	5.4	9.3	1.5	6.1	0	10.2	1.4	0	3.2	8.2	1.0	0	5.6
MAY 11	S	0.0	0.0	6.9	19.8	23.5	0.0	8.4	3.5	0.0	0.0	58.1	10.8	0	12.1	15.0	19.3	0.0	10.5
	M	4.7	9.7	0.0	52.6	105.1	0.0	28.7	0.0	4.8	8.9	13.1	15.4	0	7.0	19.0	57.4	2.8	19.6
	B	6.3	5.0	0.0	25.9	59.2	4.4	16.8	4.9	5.4	9.8	5.4	19.8	0	7.6	4.0	15.4	0.0	11.0
	MEAN	3.6	4.9	2.3	32.8	62.6	1.5	18.0	2.8	3.4	6.2	25.5	15.3	0	8.9	12.6	30.7	0.9	13.7
MAY 16	S	0.0	0	0	0	3.5	0	0.6	0	0	0	0.0	0	0	0	0	0	0.0	0.2
	M	3.6	0	0	0	0.0	0	0.6	0	0	0	3.4	0	0	0.6	0	0	2.6	0.6
	B	0.0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0	0.0	0
	MEAN	1.2	0	0	0	1.2	0	0.4	0	0	0	1.1	0	0	0.2	0	0	0.9	0.3
MAY 23	S	0	0	0.0	0	0	0	0	No Catch						0	No Catch			0
	M	0	0	0.0	0	0	0	0							0				0
	B	0	0	5.4	0	0	0	0.9							0				0.4
	MEAN	0	0	1.8	0	0	0	0.3							0				0.1
MAY 31	S	No Catch						0	0	0	0	0	0.0	0.0	0	0.0	0.0	0	0
	M							0	0	0	0	0	3.0	17.5	3.4	3.0	2.9	0	1.8
	B							0	0	0	0	0	0.0	0.0	0	0.0	0.0	0	0
	MEAN							0	0	0	0	0	1.0	5.8	1.1	1.0	1.0	0	0.6

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-7

ABUNDANCE[1] OF TOTAL PROLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	20-FT 1-WEST	20-FT 1/2-WEST	20-FT 1/2-EAST	20-FT 1-EAST	20-FT 3-EAST	20-FT MEAN	40-FT CONTOUR[3] 3-WEST	40-FT 1-WEST	40-FT 1/2-WEST	40-FT 1/2-EAST	40-FT 1-EAST	40-FT 3-EAST	40-FT MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11	S	No Catch							4.9	0	0.0	0.0	0.0	0	0.8	No Catch			0.3
	M								0.0	0	0.0	0.0	0.0	0	0				0
	B								0.0	0	2.9	3.4	3.6	0	1.7				0.7
	MEAN								1.6	0	1.0	1.2	1.2	0	0.8				0.3
JUN 14	S	0.0	0	0.0	6.6	8.6	0.0	2.5	0	0.0	0.0	9.2	0.0	0.0	1.5	0.0	0	0.0	1.6
	M	4.3	0	3.8	0.0	0.0	8.5	2.8	0	6.8	3.8	7.9	8.0	4.0	5.1	3.4	0	0.0	3.4
	B	0.0	0	3.9	4.1	0.0	0.0	1.3	0	3.6	4.1	0.0	0.0	8.0	2.6	3.3	0	3.3	2.0
	MEAN	1.4	0	2.6	3.6	2.9	2.8	2.2	0	3.5	2.6	5.7	2.7	4.0	3.1	2.2	0	1.1	2.3
JUN 20	S	0.0	5.2	0.0	0	0	0.0	0.9	0	0	0.0	10.0	0.0	0.0	1.7	0.0	0	0	1.0
	M	0.0	0.0	7.6	0	0	0.0	1.3	0	0	4.0	4.0	12.2	4.0	4.0	3.4	0	0	2.3
	B	25.2	20.6	25.3	0	0	3.6	12.5	0	0	6.1	0.0	30.8	0.0	6.2	9.2	0	0	8.1
	MEAN	8.4	8.6	11.0	0	0	1.2	4.9	0	0	3.4	4.7	14.3	1.4	4.0	4.2	0	0	3.8
JUN 27	S	13.6	0	0	4.9	0	4.4	3.8	0	0	0	32.9	0	0.0	5.5	40.2	0	0.0	6.4
	M	0.0	0	0	0.0	0	0.0	0	0	0	0	0.0	0	0.0	0	7.6	0	0.0	0.5
	B	4.7	0	0	0.0	0	3.2	1.3	0	0	0	0.0	0	10.4	1.7	0.0	0	2.5	1.4
	MEAN	6.1	0	0	1.6	0	2.5	1.7	0	0	0	11.0	0	3.5	2.4	15.9	0	0.8	2.8
JUL 9	S	26.2	0.0	42.3	30.5	21.0	66.8	31.1	0	16.2	0.0	4.6	8.9	20.6	8.4	4.5	0	0	16.1
	M	22.9	4.9	42.3	0.0	10.5	86.3	27.8	0	0.0	0.0	11.6	0.0	19.7	5.2	3.9	0	0	13.5
	B	9.0	0.0	0.0	6.9	0.0	17.5	5.6	0	3.9	12.7	13.2	0.0	3.9	5.6	0.0	0	0	4.5
	MEAN	19.4	1.6	28.2	12.5	10.5	56.8	21.5	0	6.7	4.2	9.8	3.0	14.7	6.4	2.8	0	0	11.4
JUL 13-15	S	74.0	9.5	92.8	50.1	9.3	22.2	43.0	233.9	4.9	74.3	0.0	13.1	26.0	58.7	4.0	20.6	14.2	43.3
	M	15.3	0.0	8.4	0.0	11.1	4.9	6.6	8.4	0.0	0.0	11.4	0.0	0.0	3.3	7.0	6.6	0.0	4.9
	B	0.0	0.0	0.0	0.0	5.8	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	4.2	0.7
	MEAN	29.8	3.2	33.7	16.7	8.7	9.0	16.9	80.8	1.6	24.8	3.8	4.4	8.7	20.7	3.7	9.0	6.1	16.3
JUL 18	S	380.7	1258.9	3011.1	2925.2	1386.8	1255.6	703.1	16.7	83.4	233.1	491.8	179.7	148.9	92.3	304.7	0	0.0	778.4
	M	10.0	76.2	2592.4	496.9	83.3	235.8	582.4	12.8	4.5	50.3	84.5	37.9	14.8	34.1	482.7	0	0.0	278.8
	B	19.4	84.0	151.9	253.9	48.1	184.6	123.7	0.0	3.9	7.7	4.1	4.8	4.5	4.2	34.0	0	2.6	53.6
	MEAN	136.7	473.0	1918.5	1225.3	506.1	558.7	803.0	9.8	30.6	97.0	193.4	74.1	56.1	76.8	273.8	0	0.9	370.2
JUL 28-29	S	0	0	30.9	0	11.9	7.6	8.4	0	0.0	13.0	4.3	3.7	0	3.5	27.7	142.2	76.1	21.2
	M	0	0	200.0	0	8.5	8.7	36.2	0	3.9	8.4	4.9	0.0	0	2.9	140.0	0.0	3.6	25.2
	B	0	0	82.0	0	0.0	17.3	16.6	0	0.0	12.6	15.1	0.0	0	4.6	0.0	0.0	3.5	8.7
	MEAN	0	0	104.3	0	6.8	11.2	20.4	0	1.3	11.4	8.1	1.2	0	3.7	55.9	47.4	27.7	18.4

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-8

ABUNDANCE[1] OF TOTAL PROLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No prolarvae were collected in day samples after August 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
AUG 1-2	S	10.1	19.4	0.0	9.9	0.0	9.5	8.2	3.1	0	0	6.5	7.2	28.9	7.6	6.4	0.0	0.0	6.7
	M	22.9	14.2	9.0	0.0	3.8	73.4	20.6	0.0	0	0	0.0	23.9	27.2	8.5	0.0	4.1	3.5	12.1
	B	44.3	12.5	0.0	3.1	0.0	4.6	10.8	4.0	0	0	4.4	4.8	25.9	6.5	0.0	0.0	11.6	7.7
	MEAN	25.7	15.4	3.0	4.3	1.3	29.2	13.1	2.4	0	0	3.6	12.0	27.4	7.6	2.1	1.4	5.0	8.8
AUG 8-9	S	0.0	0.0	3.9	0	0	0	0.7	0	7.0	7.2	0	0	0	2.4	4.4	0	2.8	1.7
	M	8.8	16.0	0.0	0	0	0	4.1	0	4.1	0.0	0	0	0	0.7	0.0	0	0.0	1.9
	B	0.0	0.0	0.0	0	0	0	0	0	0.0	3.5	0	NS	0	0.7	0.0	NS	0.0	0.3
	MEAN	2.9	5.3	1.3	0	0	0	1.6	0	3.7	3.6	0	0	0	1.2	1.5	0	0.9	1.3
AUG 15	S																		
	M	No Catch							No Catch							No Catch			
	B																		
	MEAN																		0
AUG 24	S																		
	M	No Catch							No Catch							No Catch			
	B																		
	MEAN																		0
AUG 31	S																		
	M	No Catch							No Catch							No Catch			
	B																		
	MEAN																		0

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-9

ABUNDANCE[1] OF TOTAL PROLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
JUN 11-12	S	16.3	10.3	37.0	0	0	6.6	11.7	0	0	5.7	0	0	0.0	1.0	5.2	0	0	5.4
	M	8.9	10.3	17.3	0	0	0.0	6.08	0	0	0.0	0	0	0.0	0	0.0	0	0	2.4
	B	0.0	0.0	0.0	0	0	4.6	0.77	0	0	0.0	0	0	3.0	0.5	0.0	0	0	0.5
	MEAN	8.4	6.9	18.1	0	0	3.7	6.2	0	0	1.9	0	0	1.0	0.5	1.8	0	0	2.8
JUN 13-14	S	5.2	0	9.5	23.8	9.9	0.0	8.1	5.0	0.0	13.5	9.0	13.8	4.6	7.7	5.7	0.0	0	6.7
	M	19.5	0	7.0	15.5	9.6	6.3	9.7	6.7	0.0	6.6	3.9	3.2	0.0	3.4	6.2	0.0	0	5.6
	B	0.0	0	8.2	28.0	19.0	16.2	11.9	3.3	16.4	17.0	3.9	6.8	8.1	9.3	2.9	4.4	0	8.9
	MEAN	8.2	0	8.2	22.4	12.8	7.5	9.9	5.0	5.4	12.4	5.6	7.9	4.2	6.8	4.9	1.4	0	7.1
JUN 22-23	S	67.8	12.9	38.4	41.7	19.2	4.5	30.8	35.0	15.6	22.6	137.3	20.5	20.2	41.9	22.9	4.4	11.1	31.6
	M	8.4	4.5	3.2	11.0	16.4	4.0	7.9	4.7	0.0	3.4	8.8	10.3	6.4	5.6	3.1	0.0	0.0	5.6
	B	23.7	8.5	19.1	17.5	19.1	7.6	15.9	0.0	11.5	0.0	18.0	20.0	11.4	10.2	6.4	0.0	0.0	10.9
	MEAN	33.3	8.6	20.2	23.4	18.2	5.4	18.2	13.2	9.0	8.6	54.7	17.0	12.7	19.2	10.8	1.5	3.7	16.0
JUN 27-28	S	102.1	41.8	25.3	22.2	17.5	17.6	37.8	106.9	13.4	13.2	17.8	13.0	0.0	27.4	22.5	8.9	8.5	28.7
	M	40.8	22.3	26.2	8.4	12.6	4.9	19.2	23.4	22.3	11.7	0.0	4.5	4.4	11.1	38.9	0.0	0.0	14.7
	B	41.9	27.7	33.7	11.9	30.8	14.8	26.8	22.3	8.3	11.8	111.8	32.8	0.0	31.2	29.5	3.3	0.0	25.4
	MEAN	61.6	30.6	28.4	14.2	20.3	12.4	27.9	50.8	14.6	12.2	43.2	16.8	1.5	23.2	30.3	4.0	2.8	22.9
JUL 7	S	29.0	65.8	61.5	5.3	0.0	14.9	29.4	0.0	0	0.0	21.5	5.3	6.2	5.5	4.9	0	0.0	14.3
	M	6.5	10.9	16.2	0.0	11.1	7.1	8.6	0.0	0	0.0	0.0	0.0	0.0	0	4.4	0	3.3	4.0
	B	6.0	11.5	14.4	3.0	20.8	19.6	12.6	2.3	0	2.3	0.0	2.8	0.0	1.2	2.3	0	1.7	5.8
	MEAN	13.8	29.4	30.7	2.8	10.6	13.8	16.9	0.8	0	0.8	7.2	2.7	2.1	2.2	3.8	0	1.6	8.0
JUL 14-15	S	177.5	110.1	164.2	143.6	188.9	49.0	138.9	132.3	142.0	106.3	117.8	21.8	94.7	102.5	15.4	9.2	0	98.2
	M	63.9	88.1	131.0	63.9	173.5	36.7	92.9	47.2	33.2	21.0	12.6	4.7	0.0	19.8	15.3	0.0	0	46.1
	B	45.8	41.6	96.6	15.1	270.6	27.0	82.8	116.7	40.8	61.3	19.6	0.0	0.0	39.7	29.0	0.0	0	50.9
	MEAN	95.7	80.0	130.6	74.2	211.0	37.6	104.8	98.7	72.0	62.8	50.0	8.8	31.6	54.0	19.9	3.1	0	65.0
JUL 18-19	S	297.3	715.7	1015.2	2306.5	4274.8	397.0	1501.1	324.7	354.7	465.0	1835.7	4235.7	1424.7	1440.1	555.8	437.0	99.6	1249.3
	M	171.8	158.4	223.7	1133.1	491.3	104.3	380.4	84.8	71.1	138.5	156.5	138.3	32.0	103.5	178.3	22.6	17.1	208.1
	B	143.1	47.6	288.7	162.5	444.8	122.1	201.5	108.9	30.1	35.8	206.1	92.8	71.5	90.9	90.3	9.8	3.0	123.8
	MEAN	204.0	307.2	509.2	1200.7	1737.0	207.8	694.3	172.8	152.0	213.1	732.8	1488.9	509.4	544.8	274.8	156.5	39.9	527.1
JUL 28-29	S	27.6	0.0	29.0	49.9	0.0	0.0	17.6	24.7	0.0	0.0	3.2	5.6	0	5.6	0.0	0.0	3.1	9.5
	M	8.1	28.9	66.5	17.7	16.8	11.3	24.9	30.2	14.6	0.0	11.6	3.5	0	10.0	17.3	3.6	0.0	15.3
	B	14.5	14.9	83.9	22.8	16.4	0.0	25.4	25.0	0.0	60.6	4.1	15.7	0	17.6	6.1	3.7	0.0	17.8
	MEAN	16.7	14.6	59.8	30.2	11.0	3.8	22.7	26.6	4.9	20.2	6.3	8.3	0	11.0	7.8	2.4	1.0	14.2

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-10

ABUNDANCE[1] OF TOTAL PROLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
AUG 2-3	S	0.0	127.2	84.5	118.7	195.4	12.3	89.7	3.5	40.8	175.6	97.3	56.1	23.6	66.6	301.1	260.0	29.0	101.7
	M	4.4	61.8	131.0	125.9	272.1	17.0	102.0	25.0	29.8	12.2	127.5	0.0	0.0	32.4	4.1	25.4	2.9	55.9
	B	0.0	119.2	48.3	163.6	231.3	0.0	93.7	4.1	34.3	19.0	8.4	0.0	6.8	12.1	13.7	59.5	2.7	47.4
	MEAN	1.5	102.8	87.9	136.0	232.9	9.8	95.1	10.9	35.0	69.0	77.8	18.7	10.1	36.9	106.3	115.0	11.6	68.3
AUG 8-9	S	NS	NS	NS	0	7.2	0	2.4	0	3.3	NS	NS	0	0	0.8	NS	0	0	1.2
	M	NS	NS	NS	0	NS	0	0	0	8.5	NS	3.6	0	0	2.4	0	NS	0	1.3
	B	0.0	17.5	0.0	0	0.0	0	2.9	0	3.5	NS	0.0	0	0	0.7	0	0	0	1.5
	MEAN	0.0	17.5	0.0	0	3.6	0	2.2	0	5.1	—	1.8	0	0	1.3	0	0	0	1.3
AUG 15-16	S, M, B, MEAN	No Catch							No Catch							No Catch			
AUG 25-26	S, M, B, MEAN	No Catch							No Catch							No Catch			
AUG 29-30	S	0	0	0	0.0	0	0	0	No Catch							No Catch			0
	M	0	0	0	0.1	0	0	<0.1											<0.1
	B	0	0	0	0.0	0	0	0											0
	MEAN	0	0	0	<0.1	0	0	<0.1											<0.1
SEP 6-7	S, M, B, MEAN	No Catch							No Catch							No Catch			
SEP 12	S, M, B, MEAN	No Catch							No Catch							No Catch			

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-11

ABUNDANCE[1] OF ALEWIFE PROLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No alewife prolarvae were collected in day samples during Apr and May 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11	S, M, B, MEAN	No Catch							No Catch							No Catch			
JUN 14	S, M, B, MEAN	No Catch							No Catch							No Catch			
JUN 20	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No Catch			0
	M	0	0	3.8	0	0	0	0.6	0	0	4.0	0	0	0	0.7				0.5
	B	3.6	0	0	0	0	0	0.6	0	0	0	0	0	0	0				0.2
	MEAN	1.2	0	1.3	0	0	0	0.4	0	0	1.3	0	0	0	0.2				0.2
JUN 27	S	13.6	0	0	0	0	0	2.3	0	0	0	23.5	0	0	3.9	0	0	0	2.5
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEAN	4.5	0	0	0	0	0	0.8	0	0	0	7.8	0	0	1.3	0	0	0	0.8
JUL 9	S	21.8	0	42.3	30.5	21.0	66.8	30.4	0	16.2	0	4.6	8.9	20.6	8.4	4.5	0	0	15.8
	M	22.9	0	42.3	0	10.5	86.3	27.0	0	0	0	11.6	0	19.7	5.2	3.9	0	0	13.1
	B	9.0	0	0	0	0	17.5	4.4	0	3.9	12.7	4.4	0	3.9	4.2	0	0	0	3.4
	MEAN	17.9	0	28.2	10.2	10.5	56.8	20.6	0	6.7	4.2	6.8	3.0	14.7	5.9	2.8	0	0	10.8
JUL 13-15	S	74.0	9.5	88.2	27.4	9.3	22.2	38.4	233.9	4.9	74.3	0	8.7	26.0	58.0	4.1	16.5	9.4	40.6
	M	15.3	0	8.4	0	11.1	0	5.8	8.4	0	0	0	0	0	1.4	0	6.6	0	3.3
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEAN	29.8	3.2	32.2	9.1	6.8	7.4	14.7	80.8	1.6	24.8	0	2.9	8.7	19.8	1.4	7.7	3.2	14.6
JUL 18	S	380.7	1251.2	3006.4	2916.5	1377.3	1255.6	1698.0	16.7	83.4	233.1	491.8	179.7	148.9	192.3	304.7	0	0	796.7
	M	10.0	71.7	2592.4	496.9	83.3	235.8	581.7	12.8	4.5	50.3	84.5	33.1	14.8	33.3	478.9	0	0	277.9
	B	14.6	84.0	151.9	253.9	48.1	184.6	122.9	0	3.9	7.7	4.1	4.8	4.5	4.2	34.0	0	2.6	53.2
	MEAN	135.1	469.0	1916.9	1222.4	502.9	558.7	800.8	9.8	30.6	97.0	193.4	72.6	56.1	76.6	272.5	0	0.9	369.2
JUL 28-29	S	0	0	30.9	0	11.9	3.8	7.8	0	0	13.0	4.3	3.7	0	3.5	27.7	142.2	76.1	20.9
	M	0	0	200.0	0	8.5	0	34.8	0	3.9	8.4	0	0	0	2.1	140.0	0	3.6	24.3
	B	0	0	82.0	0	0	17.3	16.6	0	0	12.6	10.1	0	0	3.8	0	0	3.5	8.4
	MEAN	0	0	104.3	0	6.8	7.0	19.7	0	1.3	11.4	4.8	1.2	0	3.1	55.9	47.4	27.7	17.9

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-12

ABUNDANCE[1] OF ALEWIFE PROLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No alewife prolarvae were collected in day samples after Aug 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
AUG 1-2	S	0	0	0	9.9	0	9.5	3.2	0	0	0	6.5	3.6	25.7	6.0	3.2	0	0	3.9
	M	0	0	9.0	0	0	61.8	11.8	0	0	0	0	23.9	27.2	8.5	0	4.1	3.5	8.6
	B	0	0	0	3.1	0	0	0.5	0	0	0	4.4	4.8	21.6	5.1	0	0	11.6	3.0
	MEAN	0	0	3.0	4.3	0	23.8	5.2	0	0	0	3.6	10.8	24.8	6.5	1.1	1.4	5.0	5.2
AUG 8-9	S M B MEAN	No Catch							No Catch[4]							No Catch			
AUG 15	S M B MEAN	No Catch							No Catch							No Catch			
AUG 24	S M B MEAN	No Catch							No Catch							No Catch			
AUG 31	S M B MEAN	No Catch							No Catch							No Catch			

[1]Number per 1000 m^3

[2]S = surface, m = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-13

ABUNDANCE[1] OF ALEWIFE PROLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
JUN 11-12	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUN 13-14	S	No Catch							0	0	0	0	0	0	0	No Catch			0
	M								0	0	0	0	0	0	0				0
	B								0	0	0	0	3.4	0	0.6				0.2
	MEAN								0	0	0	0	1.1	0	0.2				0.1
JUN 22-23	S	12.7	0	8.5	4.6	4.8	4.5	5.8	17.5	0	0	12.9	0	0	5.1	3.8	0	0	4.6
	M	4.2	2.3	0	0	0	0	1.1	0	0	0	0	0	0	0	0	0	0	0.4
	B	9.5	0	0	0	11.4	3.8	4.1	0	0	0	0	0	0	0	0	0	0	1.6
	MEAN	8.8	0.8	2.8	1.5	5.4	2.8	3.7	5.8	0	0	4.3	0	0	1.7	1.3	0	0	2.2
JUN 27-28	S	12.8	9.3	0	0	4.4	0	4.4	25.7	8.9	4.4	8.9	0	0	8.0	4.5	0	0	5.3
	M	4.1	0	0	0	0	0	0.7	0	0	3.9	0	0	0	0.6	0	0	0	0.5
	B	4.2	4.6	8.4	7.9	0	0	4.2	0	0	0	13.2	0	0	2.2	0	0	0	2.5
	MEAN	7.0	4.6	2.8	2.6	1.5	0	3.1	8.6	3.0	2.8	7.4	0	0	3.6	1.5	0	0	2.8
JUL 7	S	4.8	9.4	0	0	0	5.0	3.2	0	0	0	0	0	6.2	1.0	No Catch			1.7
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	B	0	0	0	0	0	15.7	2.6	0	0	0	0	0	0	0				1.0
	MEAN	1.6	3.1	0	0	0	6.9	1.9	0	0	0	0	0	2.1	0.4				0.9
JUL 14-15	S	60.8	25.0	28.2	58.5	101.0	14.7	48.0	37.8	47.3	50.6	40.8	21.8	90.2	48.1	0	4.6	0	38.8
	M	4.9	0	0	39.3	0	5.3	8.3	0	0	0	0	4.7	0	0.8	0	0	0	3.6
	B	0	0	0	5.0	10.8	0	2.6	0	0	0	0	0	0	0	4.1	0	0	1.3
	MEAN	21.9	8.3	9.4	34.3	37.2	6.6	19.6	12.6	15.8	16.8	13.6	8.8	30.0	16.3	1.4	1.5	0	14.5
JUL 18-19	S	201.0	667.4	846.0	2251.0	4227.8	356.9	1425.0	284.6	318.8	448.9	1835.7	4175.8	1409.0	1412.1	493.6	388.4	67.6	1198.2
	M	120.7	123.8	95.4	1076.9	309.4	49.9	296.0	17.0	31.1	77.0	145.3	118.5	21.3	68.4	147.0	16.1	13.7	157.5
	B	26.8	8.7	180.4	159.7	246.6	84.0	117.7	49.2	3.8	16.3	188.3	74.9	56.4	64.8	55.4	3.3	3.0	77.1
	MEAN	116.2	266.6	373.9	1162.5	1594.6	163.6	612.9	116.9	117.9	180.7	723.1	1456.4	495.6	515.1	232.0	135.9	28.1	477.6
JUL 28-29	S	0	0	29.0	7.1	0	0	6.0	6.2	0	0	3.2	5.6	0	2.5	0	0	3.1	3.6
	M	0	14.5	16.6	0	16.8	11.3	9.9	30.2	7.3	0	3.9	3.5	0	7.5	13.8	3.6	0	8.1
	B	14.5	14.9	0	3.8	16.4	0	8.3	12.5	0	60.6	4.1	15.7	0	15.5	0	0	0	9.5
	MEAN	4.8	9.8	15.2	3.6	11.0	3.8	8.0	16.3	2.4	20.2	3.7	8.3	0	8.5	4.6	1.2	1.0	7.1

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-14

ABUNDANCE[1] OF ALEWIFE PROLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
AUG 2-3	S	0	0	0	0	0	0	0	No Catch						0	No Catch			0
	M	4.4	0	0	0	0	0	0.7							0				0.3
	B	0	0	0	4.1	0	0	0.7							0				0.3
	MEAN	1.5	0	0	1.4	0	0	0.5							0				0.2
AUG 8-9	S	NS	NS	NS	0	0	0	0	0	0	NS	NS	0	0	0	NS	0	0	0
	M	NS	NS	NS	0	NS	0	0	0	0	NS	0	0	0	0	0	NS	0	0
	B	0	0	0	0	0	0	0	0	0	NS	0	0	0	0	0	0	0	0
	MEAN	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
AUG 15-16	S M B MEAN	No Catch							No Catch							No Catch			
AUG 25-26	S M B MEAN	No Catch							No Catch							No Catch			
AUG 29-30	S M B MEAN	No Catch							No Catch							No Catch			
SEP 6-7	S M B MEAN	No Catch							No Catch							No Catch			
SEP 12	S M B MEAN	No Catch							No Catch							No Catch			

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-15

ABUNDANCE[1] OF *MORONE* SP. PROLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
APR 10	S	No Samples Taken Due to Weather							0	No Samples Taken Except Surface and Mid-Depth at 3-West Due to Weather						No Samples Taken Due to Weather			
	M								0										
	B																		
	MEAN								0.0										
APR 15-16	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
APR 18	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
APR 30-MAY 1	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
MAY 3	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
MAY 11	S	0	0	0	0	0	0	0	No Catch							No Catch			0
	M	0	0	0	0	0	0	0											0
	B	6.3	0	0	0	0	0	1.1											0.1
	MEAN	2.1	0	0	0	0	0	0.4											<0.1
MAY 16	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
MAY 23	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
MAY 31	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

[4]White perch or white bass

Table E-16

ABUNDANCE[1] OF *MORONE* SP. PROLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

(No *Morone* sp. prolarvae were collected in day samples after July 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	20-FT 1-WEST	20-FT 1/2-WEST	20-FT 1/2-EAST	20-FT 1-EAST	20-FT 3-EAST	20-FT MEAN	40-FT CONTOUR[3] 3-WEST	40-FT 1-WEST	40-FT 1/2-WEST	40-FT 1/2-EAST	40-FT 1-EAST	40-FT 3-EAST	40-FT MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11	S	No Catch							4.9	0	0	0	0	0	0.8	No Catch			0.3
	M								0	0	0	0	0	0	0				0
	B								0	0	2.9	3.4	3.6	0	1.6				0.7
	MEAN								1.6	0	1.0	1.1	1.2	0	0.8				0.3
JUN 14	S	0	0	0	6.6	8.6	0	2.5	0	0	0	9.1	0	0	1.5	0	0	0	1.6
	M	4.3	0	3.8	0	0	8.5	2.8	0	6.8	3.8	7.9	8.0	4.0	5.1	3.4	0	0	3.4
	B	0	0	3.9	4.1	0	0	1.3	0	3.6	4.1	0	0	7.9	2.6	3.3	0	3.3	2.0
	MEAN	1.4	0	2.6	3.6	2.9	2.8	2.2	0	3.5	2.6	5.7	2.7	4.0	3.1	2.2	0	1.1	2.3
JUN 20	S	0	5.2	0	0	0	0	0.9	0	0	0	5.0	0	0	0.8	0	0	0	0.7
	M	0	0	3.8	0	0	0	0.6	0	0	0	0	12.2	4.0	2.7	3.4	0	0	1.6
	B	21.6	20.6	25.3	0	0	3.6	11.8	0	0	6.1	0	30.8	0	6.2	9.2	0	0	7.8
	MEAN	7.2	8.6	9.7	0	0	1.2	4.4	0	0	2.0	1.7	14.3	1.3	3.2	4.2	0	0	3.3
JUN 27	S	0	0	0	0	0	0	0	0	0	0	4.7	0	0	0.8	4.5	0	0	0.6
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B	0	0	0	0	0	3.1	0.5	0	0	0	0	0	10.4	1.7	0	0	2.5	1.1
	MEAN	0	0	0	0	0	1.0	0.2	0	0	0	1.6	0	3.5	0.8	1.5	0	0.8	0.6
JUL 9	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No Catch			0
	M	0	4.9	0	0	0	0	.8	0	0	0	0	0	0	0				.3
	B	0	0	0	0	0	0	0	0	0	0	8.8	0	0	1.5				.6
	MEAN	0	1.6	0	0	0	0	0.3	0	0	0	2.9	0	0	0.5				.3
JUL 13-15	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No Catch			0
	M	0	0	0	0	0	0	0	0	0	0	5.7	0	0	1.0				.4
	B	0	0	0	0	5.8	0	1.0	0	0	0	0	0	0	0				.4
	MEAN	0	0	0	0	1.9	0	0.3	0	0	0	1.9	0	0	0.3				.3
JUL 18	S	0	7.6	4.7	8.6	0	0	3.5	0	0	0	0	0	0	0	0	0	0	1.4
	M	0	4.5	0	0	0	0	.8	0	0	0	0	4.7	0	.8	3.9	0	0	.9
	B	4.8	0	0	0	0	0	.8	0	0	0	0	0	0	0	0	0	0	.3
	MEAN	1.6	4.0	1.6	2.9	0	0	1.7	0	0	0	0	1.6	0	0.3	1.3	0	0	.9
JUL 28-29	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine-Mile Point Station, Unit 1

Table E-17

ABUNDANCE[1] OF *MORONE* SP. PROLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No *Morone* sp. prolarvae were collected in night samples after July 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
JUN 11-12	S	10.9	5.2	31.7	0	0	6.6	9.1	0	0	5.7	0	0	0	0.9	5.2	0	0	4.4
	M	8.9	10.3	17.3	0	0	0	6.1	0	0	0	0	0	0	0	0	0	0	2.4
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEAN	6.6	5.2	16.3	0	0	2.2	5.0	0	0	1.9	0	0	0	0.3	1.7	0	0	2.3
JUN 13-14	S	5.2	0	9.5	19.0	4.9	0	6.4	0	0	4.5	9.0	13.8	4.6	5.3	5.7	0	0	5.1
	M	9.7	0	7.0	11.6	4.8	6.3	6.6	3.3	0	6.6	3.9	3.2	0	2.8	6.2	0	0	4.2
	B	0	0	8.2	20.0	19.0	16.1	10.5	3.3	9.8	17.0	3.9	3.4	8.1	7.6	2.9	4.4	0	7.7
	MEAN	5.0	0	8.2	16.9	9.6	7.5	7.8	2.2	3.3	9.4	5.6	6.8	4.2	5.2	4.9	1.5	0	5.7
JUN 22-23	S	12.7	0	29.8	37.1	14.4	0	15.7	8.7	11.7	18.8	124.4	16.4	12.1	32.0	15.2	4.4	11.1	21.1
	M	0	2.3	3.2	3.7	4.1	4.0	2.9	0	0	3.4	0	10.3	6.4	3.4	3.1	0	0	2.7
	B	0	4.2	15.3	13.1	7.6	3.8	7.3	0	11.5	0	9.0	16.7	11.4	8.1	3.2	0	0	6.4
	MEAN	4.2	2.2	16.1	18.0	8.7	2.6	8.6	2.9	7.7	7.4	44.5	14.5	10.0	14.5	7.2	1.5	3.7	10.1
JUN 27-28	S	0	0	0	0	0	0	0	12.8	0	0	4.4	0	0	2.9	0	0	0	1.1
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B	0	0	0	0	0	0	0	8.9	0	0	16.4	0	0	4.2	0	0	0	1.7
	MEAN	0	0	0	0	0	0	0	7.2	0	0	6.9	0	0	2.4	0	0	0	0.9
JUL 7	S	19.4	4.7	0	5.3	0	0	4.9	0	0	0	5.4	0	0	.9	0	0	0	2.3
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.2	0	0	.1
	B	3.0	0	0	0	4.2	0	1.2	0	0	0	0	2.8	0	.5	0	0	0	.7
	MEAN	7.5	1.6	0	1.8	1.4	0	2.0	0	0	0	1.8	0.9	0	0.4	0.7	0	0	1.0
JUL 14-15	S	0	0	0	0	35.1	0	5.9	0	4.7	5.1	0	0	0	1.6	No Catch			3.0
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	MEAN	0	0	0	0	11.7	0	2.0	0	1.6	1.7	0	0	0	0.5				1.0
JUL 18-19	S	4.2	4.0	12.1	7.9	0	0	4.7	12.0	4.0	4.0	0	29.9	15.7	10.9	3.7	0	28.5	8.4
	M	0	0	0	4.3	0	0	.7	4.2	0	0	0	0	0	.7	18.8	0	0	1.8
	B	4.5	0	9.0	1.4	0	0	2.5	3.5	3.8	0	3.6	0	11.3	3.7	5.8	0	0	2.9
	MEAN	2.9	1.3	7.0	4.6	0	0	2.6	6.6	2.6	1.4	1.2	10.0	9.0	5.1	9.4	0	9.5	3.7
JUL 28-29	S	0	0	0	0	0	0	0	No Catch						0	No Catch			0
	M	0	14.5	0	0	0	0	2.4							0				1.0
	B	0	0	0	0	0	0	0							0				0
	MEAN	0	4.8	0	0	0	0	0.8							0				.3

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-18

ABUNDANCE[1] OF RAINBOW SMELT PROLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No rainbow smelt prolarvae were collected in day samples after May 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
APR 10	S M B MEAN	No Samples Taken Due to Weather							0 0 0.0	No Samples Taken Except Surface and Mid-Depth at 3-West Due to Weather						No Samples Taken Due to Weather			
APR 15 - 16	S M B MEAN	No Catch							No Catch							No Catch			
APR 18	S M B MEAN	No Catch							No Catch							No Catch			
APR 30 - MAY 1	S M B MEAN	No Catch							No Catch							No Catch			
MAY 3	S M B MEAN	No Catch							No Catch							No Catch			
MAY 11	S M B MEAN	0 0 0 0	0 0 5.0 1.7	3.4 0 0 1.1	0 7.0 0 2.3	0 3.9 0 1.3	0 0 0 0	0.6 1.8 0.8 1.1	0 0 0 0	0 0 5.4 1.8	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0.0 0.0 0.9 0.3	No Catch			0.2 0.7 0.7 0.5
MAY 16	S M B MEAN	0 3.6 0 1.2	0 0 0 0	0 0 0 0	0 0 0 0	3.5 0 0 1.2	0 0 0 0	0.6 0.6 0.0 0.4	No Catch							No Catch			0.2 0.2 0.0 0.1
MAY 23	S M B MEAN	0 0 0 0	0 0 0 0	0 0 5.4 1.8	0 0 0 0	0 0 0 0	0 0 0 0	0.0 0.0 0.9 0.3	No Catch							No Catch			0.0 0.0 0.4 0.1
MAY 31	S M B MEAN	No Catch							0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 5.8 0 1.9	0.0 1.0 0.0 0.3	0 3.0 0 1.0	0 0 0 0	0 0 0 0	0.0 0.6 0.0 0.2

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-19

ABUNDANCE[1] OF RAINBOW SMELT PROLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No rainbow smelt prolarvae were collected in night samples after Jun 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11-12	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUN 13-14	S	No Catch							0	0	0	0	0	0	0	No Catch			0
	M								0	0	0	0	0	0	0				0
	B								0	6.5	0	0	0	0	1.1				0.4
	MEAN								0	2.2	0	0	0	0	0.4				0.1
JUN 22-23	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8	0	0	0.2
	M	0	0	0	0	0	0	0	0	0	0	8.8	0	0	1.5	0	0	0	0.6
	B	0	0	0	4.4	0	0	0.7	0	0	0	9.0	3.3	0	2.0	3.2	0	0	1.3
	MEAN	0	0	0	1.5	0	0	0.2	0	0	0	5.9	1.1	0	1.2	2.3	0	0	0.7
JUN 27-28	S	0	0	0	0	0	0	0	No Catch							No Catch			0
	M	0	0	0	0	0	0	0											0
	B	0	4.6	0	0	0	0	0.8											0.3
	MEAN	0	1.5	0	0	0	0	0.3											0.1
JUL 7	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUL 14-15	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUL 18-19	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUL 28-29	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-20

ABUNDANCE[1] OF TOTAL POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
APR 10	S	No Samples Taken Due to Weather							0	No Samples Taken Except Surface and Mid-Depth at 3-West Due to Weather						No Samples Taken Due to Weather			
	M								0										
	B																		
	MEAN								0										
APR 15-16	S	0.0	0	0	0	0	1.8	0.3	No Catch						0	No Catch			0.1
	M	4.0	0	0	0	0	0.0	0.7							0				0.3
	B	0.0	0	0	0	0	0.0	0							0				0
	MEAN	1.3	0	0	0	0	0.6	0.3							0				0.1
APR 18	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
APR 30-MAY 1	S	46.1	32.7	143.2	46.4	5.1	49.0	53.8	14.7	122.3	59.6	341.4	0.0	75.6	102.3	8.1	0	0	62.9
	M	26.6	189.3	22.5	143.9	78.6	221.9	113.8	6.0	156.8	23.8	1.9	20.8	223.9	72.2	4.2	0	0	74.7
	B	22.0	100.3	29.6	143.9	37.9	159.9	82.3	13.3	66.7	24.7	46.1	7.9	40.3	33.2	0.0	0	0	46.2
	MEAN	31.6	107.4	65.1	111.4	40.6	143.6	83.3	11.3	115.3	36.0	129.8	9.6	113.3	69.2	4.1	0	0	61.3
MAY 3	S	26.7	40.7	35.8	42.8	40.0	12.4	33.1	4.4	6.1	9.2	35.7	13.0	13.9	13.7	4.9	5.0	0	19.4
	M	32.6	4.2	4.5	0.0	0.0	3.8	7.5	12.2	24.8	20.4	8.0	3.5	0.0	11.5	0.0	0.0	0	7.6
	B	96.2	14.5	9.9	4.6	0.0	4.6	21.6	4.5	10.7	0.0	4.0	3.7	21.1	7.3	0.0	3.0	0	11.8
	MEAN	51.8	19.8	16.7	15.8	13.3	7.0	20.7	7.0	13.8	9.9	15.9	6.7	11.7	10.8	1.6	2.7	0	12.9
MAY 11	S	14.5	10.9	44.7	123.1	105.9	0.0	49.9	10.5	17.2	19.2	143.5	10.8	0	33.5	26.3	50.2	3.6	38.7
	M	51.4	29.2	47.2	210.5	369.9	0.0	118.0	28.8	33.3	66.8	56.6	57.9	0	40.6	19.0	99.6	5.6	71.7
	B	12.6	25.2	15.7	46.6	182.8	8.8	48.6	14.6	21.6	0.0	27.3	29.7	0	15.5	15.9	38.5	2.9	29.5
	MEAN	26.2	21.8	35.9	126.8	219.6	2.9	72.2	18.0	24.0	28.7	75.8	32.8	0	29.9	20.4	62.8	4.0	46.6
MAY 16	S	0.0	0.0	0.0	0.0	0.0	7.4	1.2	3.8	0.0	0.0	3.2	0.0	0.0	1.2	0.0	0	0.0	1.0
	M	18.1	0.0	19.6	0.0	11.1	0.0	8.1	4.1	8.1	7.0	0.0	4.4	20.1	7.3	6.5	0	5.2	6.9
	B	3.7	3.9	3.5	3.7	7.3	4.0	4.4	0.0	8.2	3.1	3.8	0.0	4.0	3.2	3.2	0	0.0	3.2
	MEAN	7.3	1.3	7.7	1.2	6.1	3.8	4.6	2.6	5.4	3.4	2.3	1.5	8.0	3.9	3.2	0	1.7	3.7
MAY 23	S	0.0	0	0	0.0	4.2	0	0.7	0	0	0.0	5.2	0.0	0	0.9	0	0.0	4.2	0.9
	M	4.2	0	0	0.0	0.0	0	0.7	0	0	3.1	0.0	3.3	0	1.1	0	3.6	0.0	0.9
	B	0.0	0	0	9.6	0.0	0	1.6	0	0	0.0	0.0	0.0	0	0	0	0.0	0.0	0.6
	MEAN	1.4	0	0	3.2	1.4	0	1.0	0	0	1.0	1.7	1.1	0	0.6	0	1.2	1.4	0.8
MAY 31	S	0	0	0.0	0	0	0	0	0	0.0	0	0	0	4.3	0.7	0	0.0	0.0	0.3
	M	0	0	3.2	0	0	0	0.5	0	0.0	0	0	0	8.8	1.5	0	2.9	2.9	1.2
	B	0	0	0.0	0	0	0	0	0	3.6	0	0	0	3.9	1.3	0	0.0	3.0	0.7
	MEAN	0	0	1.1	0	0	0	0.2	0	1.2	0	0	0	5.6	1.1	0	1.0	2.0	0.7

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-21

ABUNDANCE[1] OF TOTAL POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
JUN 11	S	0.0	5.0	4.9	5.0	0.0	5.1	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0	1.3
	M	0.0	16.8	18.5	28.2	4.0	7.1	12.4	6.9	10.8	7.0	4.0	0.0	0.0	4.8	3.6	0.0	3.2	7.3
	B	12.1	0.0	8.7	16.5	11.4	3.6	8.7	15.6	3.0	2.9	17.3	14.6	2.7	9.4	0.0	2.6	5.8	7.8
	MEAN	4.0	7.3	10.7	16.6	5.1	5.3	8.2	7.5	4.6	3.3	7.1	4.9	0.9	4.7	1.2	0.9	3.0	5.5
JUN 14	S	0.0	8.4	0.0	68.8	25.8	9.5	18.8	0.0	4.2	0.0	4.6	8.3	4.4	3.6	7.1	120.0	21.4	18.8
	M	0.0	26.9	22.6	107.6	27.6	21.3	34.3	7.0	0.0	7.6	7.9	36.0	0.0	9.8	10.2	11.3	26.3	20.8
	B	9.6	16.9	43.1	123.3	50.6	29.5	45.5	0.0	3.6	8.2	12.0	30.2	4.0	9.7	19.9	37.8	33.4	28.1
	MEAN	3.2	17.4	21.9	99.9	34.7	20.1	32.9	2.3	2.6	5.3	8.2	24.8	2.8	7.7	12.4	56.4	27.0	22.6
JUN 20	S	5.3	0.0	12.2	0.0	0.0	0.0	2.9	0.0	0.0	0.0	25.1	17.2	0.0	7.1	11.6	19.8	5.8	6.5
	M	26.5	3.6	41.7	45.0	13.9	10.6	23.6	7.3	18.4	4.0	24.0	60.9	40.5	25.9	20.7	7.1	13.0	22.5
	B	43.1	41.3	47.0	29.7	42.4	25.2	38.1	14.4	3.7	6.1	18.1	11.6	23.5	12.9	15.3	3.0	11.2	22.4
	MEAN	25.0	15.0	33.6	24.9	18.8	11.9	21.5	7.2	7.4	3.4	22.4	29.9	21.3	15.3	15.9	10.0	10.0	17.1
JUN 27	S	4.5	55.1	28.4	34.5	0.0	4.4	21.2	18.4	14.0	32.9	42.3	4.6	7.2	19.9	26.8	19.4	15.2	20.5
	M	40.8	4.6	38.1	4.3	3.6	10.3	17.0	12.7	8.7	43.5	7.8	3.7	27.3	17.3	18.9	12.3	9.1	16.4
	B	37.4	19.1	87.2	0.0	3.9	6.3	25.7	8.5	4.2	64.1	0.0	3.2	15.6	15.9	4.0	3.0	0.0	17.1
	MEAN	27.6	26.3	51.2	12.9	2.5	7.0	21.2	13.2	8.9	46.8	16.7	3.8	16.7	17.7	16.6	11.6	8.1	18.0
JUL 9	S	462.8	21.1	304.5	56.7	36.7	16.7	149.8	82.2	515.6	37.8	36.8	40.2	53.6	127.7	0.0	3.7	0.0	111.2
	M	155.8	122.9	287.7	28.8	110.3	107.8	135.6	8.4	8.4	16.4	5.8	4.3	44.2	14.6	11.7	3.4	3.2	61.3
	B	158.4	74.1	37.5	3.4	62.3	48.2	64.0	22.9	15.7	8.4	4.4	0.0	35.0	14.4	0.0	0.0	0.0	31.4
	MEAN	259.0	72.7	209.9	29.6	69.8	57.6	116.4	37.8	179.9	20.9	15.6	14.8	44.3	52.2	3.9	2.4	1.1	67.9
JUL 13-15	S	161.2	95.1	533.7	168.7	28.0	62.2	174.8	433.7	136.5	650.1	78.7	78.4	72.8	241.7	48.6	1000.0	1162.8	314.0
	M	122.4	31.2	101.0	45.4	49.9	24.3	62.4	113.7	30.7	89.0	11.4	28.5	18.7	48.7	27.9	105.3	129.9	70.0
	B	27.2	14.4	42.5	5.8	5.8	15.9	18.6	18.0	32.6	39.2	0.0	9.3	0.0	16.5	23.0	111.3	20.8	24.4
	MEAN	103.6	46.9	225.7	73.3	27.9	34.1	85.2	188.5	66.6	259.4	30.0	38.7	30.5	102.3	33.2	405.6	437.8	133.4
JUL 18	S	927.1	1461.7	6642.1	830.8	1025.9	2258.3	2191.0	70.8	531.2	1383.3	1274.3	906.7	1283.5	908.3	1635.3	49.8	21.2	1353.5
	M	408.2	224.2	4688.4	459.8	265.6	1760.4	1301.1	123.9	192.9	473.6	262.4	421.3	256.3	288.4	799.4	51.8	47.4	695.7
	B	194.0	104.9	525.1	67.1	113.7	179.6	197.4	34.6	77.8	88.3	90.0	82.3	154.3	87.9	105.6	9.4	7.9	122.3
	MEAN	509.7	596.9	3951.9	452.6	468.4	1399.4	1229.8	76.4	267.3	648.4	542.2	470.1	564.7	428.2	846.8	37.0	25.5	723.8
JUL 28-29	S	3014.1	842.4	3079.3	476.6	921.9	934.9	1544.9	826.1	715.1	2677.9	421.2	509.2	221.4	895.2	1266.2	5736.2	3272.3	1661.0
	M	4952.2	1400.8	5616.1	874.3	1530.4	1921.2	2715.8	150.5	794.6	1963.8	68.8	121.8	64.7	527.4	2176.5	204.2	171.7	1467.4
	B	194.9	263.2	2141.1	74.1	179.0	376.4	538.1	238.9	81.6	117.7	131.1	85.7	46.3	116.9	148.0	168.4	116.6	290.9
	MEAN	2720.4	835.4	3612.1	475.0	877.1	1077.5	1599.6	405.2	530.4	1586.5	207.0	238.9	110.8	513.1	1196.9	2036.3	1186.9	1139.8

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-22

ABUNDANCE[1] OF TOTAL POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
AUG 1-2	S	1614.9	2130.8	8825.1	426.6	386.3	595.9	2329.9	1214.3	2166.0	1384.4	714.2	712.3	758.9	1158.4	137.5	227.7	185.0	1432.0
	M	1852.4	2969.6	2577.0	640.0	490.5	537.3	1511.1	2119.0	2573.0	802.3	50.6	577.6	459.2	1097.0	28.2	28.9	24.7	1048.7
	B	469.3	2745.8	2456.6	173.4	158.6	356.2	1060.0	268.6	258.4	285.2	39.5	72.2	185.5	185.0	40.3	140.7	111.7	517.4
	MEAN	1312.2	2615.4	4619.6	413.4	345.1	496.4	1633.7	1200.6	1665.8	824.0	268.1	454.0	467.8	813.4	68.7	132.4	107.2	999.4
AUG 8-9	S	16.3	18.8	264.3	40.6	226.1	174.6	123.5	14.5	14.1	180.0	107.5	84.4	183.7	97.4	227.7	1204.2	39.7	186.4
	M	8.8	28.0	126.9	76.8	39.9	148.9	71.6	45.7	24.6	445.3	46.8	50.1	713.3	221.0	0.0	132.9	100.7	132.6
	B	29.7	26.8	189.8	21.7	65.5	70.0	67.3	36.5	17.7	189.3	26.7	NS	42.8	62.6	14.4	NS	34.2	58.9
	MEAN	18.3	24.5	193.7	46.4	110.5	131.2	87.4	32.2	18.8	271.6	60.3	67.3	313.2	127.2	80.7	668.6	58.2	139.7
AUG 15	S	63.0	54.7	457.1	17.8	0	0	98.8	1148.4	851.3	932.5	26.9	23.0	95.5	512.9	74.0	226.7	22.9	266.3
	M	33.5	39.9	335.6	17.5	0	0	71.1	456.4	815.6	260.3	8.1	32.4	0.0	262.1	4.2	7.8	3.8	134.3
	B	16.9	4.4	39.7	4.4	0	0	10.9	34.0	56.4	136.0	0.0	0.0	28.8	42.5	32.4	44.0	10.5	27.2
	MEAN	37.8	33.0	277.5	13.2	0	0	60.2	546.3	574.4	443.0	11.7	18.4	41.4	272.5	36.9	92.8	12.4	142.6
AUG 24	S	36.8	71.7	98.7	301.1	496.2	221.7	204.4	16.0	99.0	104.9	354.2	74.2	268.0	152.7	257.3	68.5	103.5	171.5
	M	16.5	116.3	87.6	163.5	393.2	98.5	145.9	0.0	21.1	5.2	34.5	0.0	35.0	16.0	58.7	4.5	0.0	69.0
	B	0.0	15.3	21.0	40.0	64.2	18.4	26.5	5.3	5.0	24.8	22.7	16.7	29.0	17.3	7.8	4.0	3.6	18.5
	MEAN	17.8	67.8	69.1	168.2	317.8	112.9	125.6	7.1	41.7	45.0	137.1	30.3	110.7	62.0	107.9	25.7	35.7	86.3
AUG 31	S	25.1	27.6	24.5	11.2	4.7	28.9	20.3	42.3	44.1	3.6	27.7	4.4	23.4	24.3	53.8	62.0	39.6	28.2
	M	25.9	34.6	9.8	22.4	39.4	46.4	29.8	35.8	25.6	8.3	14.7	3.5	26.5	19.1	0.0	0.0	3.9	19.8
	B	0.0	14.9	0.0	12.1	0.0	9.9	6.2	8.4	4.2	12.2	0.0	0.0	0.0	4.1	4.6	4.2	9.8	5.4
	MEAN	17.0	25.7	11.4	15.2	14.7	28.4	18.8	28.8	24.6	8.0	14.1	2.6	16.6	15.8	19.5	22.1	17.8	17.8
SEP 7	S	0.0	0.0	20.6	365.4	21.9	13.1	70.2	0.0	16.0	4.1	8.4	0	8.3	6.1	4.4	0.0	0	30.8
	M	10.9	9.9	0.0	11.0	0.0	0.0	5.3	0.0	0.0	0.0	0.0	0	5.0	0.8	0.0	4.3	0	2.7
	B	0.0	4.6	5.6	5.2	0.0	0.0	2.6	8.4	0.0	0.0	0.0	0	0.0	1.4	0.0	0.0	0	1.6
	MEAN	3.6	4.8	8.7	127.2	7.3	4.4	26.0	2.8	5.3	1.4	2.8	0	4.4	2.8	1.5	1.4	0	11.7
SEP 12	S	9.3	37.6	9.4	0	4.3	0	10.1	No Catch							No Catch			4.0
	M	16.6	31.4	10.4	0	5.2	0	10.6											4.2
	B	5.5	11.1	0.0	0	0.0	0	2.8											1.1
	MEAN	10.4	26.7	6.6	0	3.2	0	7.8											3.1
SEP 20	S	0	5.5	13.1	0	7.7	3.8	5.0	0	0.0	0.0	3.8	3.9	3.1	1.8	No Catch			2.7
	M	0	0.0	8.9	0	4.2	11.5	4.1	0	0.0	4.8	4.1	0.0	0.0	1.5				2.2
	B	0	6.3	0.0	0	0.0	3.3	1.6	0	4.3	4.3	0.0	0.0	0.0	1.4				1.2
	MEAN	0	3.9	7.3	0	4.0	6.2	3.6	0	1.4	3.0	2.6	1.3	1.0	1.6				2.1
SEP 26	S	0	0	0	0	0	0.0	0	No Catch							No Catch			0
	M	0	0	0	0	0	4.7	0.8											0.3
	B	0	0	0	0	0	0.0	0											0
	MEAN	0	0	0	0	0	1.6	0.3											0.1

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-23

ABUNDANCE[1] OF TOTAL POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No postlarvae collected in day samples after Nov 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	20-FT 1-WEST	20-FT 1/2-WEST	20-FT 1/2-EAST	20-FT 1-EAST	20-FT 3-EAST	20-FT MEAN	40-FT CONTOUR[3] 3-WEST	40-FT 1-WEST	40-FT 1/2-WEST	40-FT 1/2-EAST	40-FT 1-EAST	40-FT 3-EAST	40-FT MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
OCT 5	S	16.2	13.0	3.4	3.8	14.8	11.0	10.4	0	0	0	0	3.6	3.1	1.1				4.6
	M	26.0	13.1	3.7	15.0	8.1	24.2	15.0	0	0	0	0	0.0	0.0	0				6.0
	B	27.8	4.7	4.0	0.0	0.0	0.0	6.1	0	0	0	0	4.8	0.0	0.8				2.8
	MEAN	23.4	10.2	3.7	6.3	7.6	11.7	10.5	0	0	0	0	2.8	1.0	0.6				4.4
OCT 11	S	0	0	0	3.8	3.7	4.0	1.9	0	0	0	0	8.1	7.8	2.6	4.0	3.7	0	2.3
	M	9.3	4.3	0	0	15.6	9.6	6.5	4.8	25.3	0	4.6	0	12.7	7.9	0	0	0	5.7
	B	0	0	0	0	4.4	9.8	2.4	0	0	0	0	0	4.3	0.7	0	0	0	1.2
	MEAN	3.1	1.4	0	1.3	7.9	7.8	3.6	1.6	8.4	0	1.5	2.7	8.3	3.8	1.3	1.2	0	3.1
OCT 18-23	S	0.0	0.0	0.0	17.0	12.7	12.4	7.0	0.0	0.0	0.0	4.1	0	6.6	1.8	0.0	0.0	0.0	3.5
	M	NS	NS	NS	58.9	5.6	25.4	30.0	NS	NS	NS	10.1	0	0.0	3.4	NS	NS	NS	16.7
	B	NS	NS	NS	4.8	10.6	0.0	5.1	NS	NS	NS	5.0	0	3.9	3.0	NS	NS	NS	4.0
	MEAN	0.0	0.0	0.0	26.9	9.6	12.3	12.2	0.0	0.0	0.0	6.4	0	3.5	2.5	0.0	0.0	0.0	6.5
OCT 24-25	S	0.0	0.0	0.0	0	4.8	0	0.8	0.0	0	0	0	0	0.0	0	0.0	0	0	0.3
	M	0.0	0.0	0.0	0	10.1	0	1.7	4.5	0	0	0	0	6.7	1.9	4.1	0	0	1.7
	B	5.3	4.2	5.0	0	4.7	0	1.9	9.3	0	0	0	0	0.0	1.6	0.0	0	0	1.9
	MEAN	1.8	1.4	1.7	0	6.5	0	1.9	4.6	0	0	0	0	2.2	1.1	1.4	0	0	1.3
OCT 31	S	0	0	0	0	3.8	0	0.6	4.2	0	0	0	4.0	0	1.4	0	0	0	0.8
	M	0	0	0	4.1	4.1	3.8	2.0	4.4	0	0	0	0	0	0.7	8.3	4.4	0	1.9
	B	0	0	4.6	4.3	0	0	1.5	0	4.4	0	4.5	0	0	1.5	0	0	0	1.2
	MEAN	0	0	1.5	2.8	2.6	1.3	1.4	2.9	1.5	0	1.5	1.3	0	1.2	2.8	1.5	0	1.3
NOV 7-8	S	0	0	0	0	0	0	0	0	7.9	0	0	0	3.8	2.0	3.4	0	0	1.0
	M	0	0	4.9	0	4.6	0	1.6	0	0	0	0	0	0	0	0	0	0	0.6
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEAN	0	0	1.6	0	1.5	0	0.5	0	2.6	0	0	0	1.3	0.6	1.1	0	0	0.5
NOV 14	S	4.4	0	7.1	0	0	0	1.9	0	4.1	4.3	0	0	0	1.4	0	0	0	1.3
	M	0	5.0	0	0	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0.3
	B	0	5.1	0	0	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0.3
	MEAN	1.4	3.4	2.4	0	0	0	1.2	0	1.4	1.4	0	0	0	0.5	0	0	0	0.7
NOV 23	S M B MEAN	No Catch							No Catch							No Catch			
NOV 30	S M B MEAN	No Catch							No Catch							No Catch			

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, due to weather and boat problems

Table E-24

ABUNDANCE[1] OF TOTAL POSTLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11-12	S	43.4	25.8	21.1	12.8	11.7	52.6	27.9	11.0	10.7	11.4	6.0	0.0	5.6	7.5	0.0	0	5.4	14.5
	M	40.1	5.1	30.2	3.4	3.9	7.8	15.1	18.7	0.0	19.8	10.5	6.4	7.3	10.5	21.0	0	5.3	12.0
	B	5.5	19.6	26.3	12.5	4.2	18.5	14.4	8.4	14.4	13.9	17.3	8.4	6.0	11.4	7.4	0	0.0	10.0
	MEAN	29.7	16.8	25.9	9.6	6.6	26.3	19.2	12.7	8.4	15.0	11.2	5.0	6.3	9.8	9.4	0	3.6	12.5
JUN 13-14	S	57.3	49.1	38.2	38.1	89.2	50.5	53.7	30.0	18.5	18.0	4.5	50.6	37.0	26.4	28.4	4.7	15.6	35.3
	M	22.7	32.8	24.5	7.7	64.5	69.2	36.9	20.0	25.7	26.4	46.6	25.7	67.0	35.2	31.0	19.7	42.6	35.1
	B	51.6	59.5	41.1	43.9	73.0	64.6	55.6	55.9	78.5	23.8	15.6	6.8	64.9	40.1	11.6	13.1	60.4	44.3
	MEAN	43.9	47.1	34.6	29.9	75.5	61.4	48.8	35.3	40.9	22.7	22.2	27.7	56.3	34.2	23.7	12.5	39.5	38.2
JUN 22-23	S	63.5	34.3	93.8	157.6	245.1	149.2	123.9	21.8	19.5	26.3	141.6	86.1	129.3	70.8	38.1	8.9	11.1	81.7
	M	42.1	4.5	113.2	183.8	340.7	206.1	148.4	9.4	13.7	10.2	11.8	51.7	118.7	36.0	6.3	33.6	18.5	77.6
	B	71.1	29.7	49.6	192.8	209.9	163.2	119.4	20.9	11.5	19.1	59.8	56.7	80.1	41.4	32.2	8.7	2.6	67.2
	MEAN	58.9	22.9	85.5	178.0	265.2	172.8	130.6	17.4	14.9	18.5	71.0	64.8	109.4	49.4	25.5	17.1	10.7	75.6
JUN 27-28	S	29.8	23.2	8.4	0.0	52.6	8.8	20.5	29.9	22.2	22.0	8.9	30.4	25.7	23.2	27.0	22.2	34.2	23.0
	M	40.8	26.7	43.6	4.2	41.9	29.2	31.1	14.0	35.7	27.4	8.0	134.3	88.2	51.3	38.9	10.6	6.9	36.7
	B	54.4	41.6	54.8	11.9	130.8	69.0	60.4	17.8	16.6	3.9	6.6	43.7	48.4	22.8	3.7	0.0	0.0	33.5
	MEAN	41.6	30.5	35.6	5.4	75.1	35.7	37.3	20.6	24.8	17.8	7.8	69.4	54.1	32.4	23.2	11.0	13.7	31.1
JUL 7	S	0	9.4	10.2	21.1	0.0	5.0	7.6	0.0	0.0	4.6	21.5	10.5	24.9	10.3	19.4	38.4	0.0	11.0
	M	0	3.6	6.5	11.6	3.7	3.6	4.8	3.0	0.0	0.0	7.2	13.2	6.0	4.9	6.6	0.0	14.7	5.3
	B	0	14.4	5.8	18.1	12.4	15.7	11.1	7.0	7.1	9.2	16.9	19.5	5.4	10.9	6.9	2.0	8.4	9.9
	MEAN	0	9.2	7.5	16.9	5.4	8.1	7.8	3.3	2.4	4.6	15.2	14.4	12.1	8.7	11.0	13.5	7.7	8.8
JUL 14-15	S	2403.6	1236.6	882.3	941.1	606.1	382.5	1075.4	2692.5	1897.8	2024.2	3979.1	2456.1	3011.5	2676.9	369.3	983.9	457.6	1621.6
	M	1022.5	425.7	529.4	240.8	120.9	320.0	443.2	392.1	507.9	373.4	273.1	240.1	476.8	377.2	114.8	97.7	36.7	344.8
	B	177.9	213.4	90.5	55.2	97.4	102.6	122.8	116.7	229.8	273.5	274.7	208.0	298.0	233.5	149.2	58.2	28.3	158.2
	MEAN	1201.4	625.2	500.7	412.4	274.8	268.4	547.1	1067.1	878.5	890.3	1509.0	968.0	1262.1	1095.8	211.1	379.9	174.2	708.2
JUL 18-19	S	100.5	430.2	318.2	198.2	970.8	529.4	424.6	264.5	530.1	501.4	417.2	1855.9	2332.7	983.6	782.5	4450.9	1024.9	980.5
	M	269.3	485.1	201.7	320.0	914.4	934.1	520.8	555.1	306.8	364.2	245.9	537.3	604.7	435.7	437.9	693.9	451.8	488.1
	B	192.3	160.2	266.2	10.5	303.9	229.0	193.7	98.3	67.8	78.2	458.4	114.2	331.1	191.3	195.2	445.1	100.4	203.4
	MEAN	187.4	358.5	262.0	176.2	729.7	564.2	379.7	306.0	301.6	314.6	373.8	835.8	1089.5	536.9	471.9	1863.3	525.7	557.3
JUL 28-29	S	3210.6	7324.8	6321.3	1369.5	4566.0	5247.3	4673.3	2393.6	1647.0	4737.4	645.6	1551.1	396.9	1895.3	263.0	171.5	129.6	2665.0
	M	3055.7	3530.1	6019.1	1372.8	2969.8	3057.3	3334.1	2927.4	1604.6	3547.2	802.5	832.0	402.4	1686.0	373.7	440.4	501.4	2095.8
	B	2820.3	4745.0	6494.1	896.5	5377.7	4931.4	4210.8	3299.5	3332.9	8669.5	1037.8	1763.4	706.8	3135.0	1755.2	304.2	130.3	3084.3
	MEAN	3028.8	5200.0	6278.2	1212.9	4304.5	4412.1	4072.8	2873.5	2194.8	5651.3	828.6	1382.2	502.0	2238.8	797.3	305.4	253.8	2615.1

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-25

ABUNDANCE[1] OF TOTAL POSTLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
AUG 2-3	S	2081.9	1796.2	528.1	1513.1	2479.9	4006.7	2067.7	361.0	448.5	647.1	822.5	842.0	2223.2	890.7	913.4	1069.6	1738.3	1431.4
	M	1076.7	2021.5	1191.8	1411.5	2219.3	5182.4	2183.9	308.8	212.9	207.7	773.5	353.3	1093.4	491.6	840.3	734.3	670.5	1219.9
	B	87.2	783.6	575.2	776.9	1595.0	1671.5	914.9	37.2	399.7	491.4	734.7	1182.4	1336.6	697.0	1467.0	443.7	759.8	822.8
	MEAN	1082.0	1533.8	765.0	1233.8	2098.1	3620.2	1722.1	235.7	353.7	448.7	776.9	792.6	1551.1	693.1	1073.6	749.2	1056.2	1158.0
AUG 8-9	S	NS	NS	NS	4886.7	1227.2	1484.6	2532.8	971.0	236.3	NS	NS	1987.7	2491.9	1421.6	NS	2443.2	2551.8	2031.1
	M	NS	NS	NS	3321.5	NS	537.9	1929.7	282.0	76.6	NS	171.1	2212.6	1805.1	909.5	555.6	NS	47.4	1001.1
	B	63.9	96.2	2918.4	1741.4	1187.5	1019.6	1171.2	323.9	67.0	NS	811.2	1302.6	1743.3	849.6	1890.1	1574.8	1515.0	1161.1
	MEAN	63.9	96.2	2918.4	3316.5	1207.3	1014.1	1680.4	525.6	126.6	-	491.1	1834.1	2013.4	1034.4	1222.9	2009.0	1371.4	1360.8
AUG 15-16	S	249.6	195.1	72.5	124.6	1082.7	109.5	305.7	24.8	293.6	104.8	88.9	496.0	558.6	261.1	74.6	185.0	100.8	250.7
	M	93.0	150.8	43.8	93.8	378.0	30.7	131.7	42.8	174.3	29.4	54.1	241.1	577.1	186.5	156.3	1223.9	365.4	243.6
	B	60.4	124.3	56.5	68.3	368.5	241.3	153.2	192.6	229.7	128.2	136.4	430.3	349.6	244.5	195.2	158.7	63.0	186.9
	MEAN	134.3	156.8	57.6	95.6	609.7	127.2	196.9	86.7	232.5	87.5	93.1	389.2	495.1	230.7	142.1	522.5	176.4	227.1
AUG 25-26	S	300.6	39.1	11.4	20.7	29.9	78.1	80.0	219.6	79.1	22.1	77.6	42.6	4.1	74.2	11.0	15.2	28.7	65.3
	M	535.7	26.8	24.8	0.0	21.1	67.0	112.6	49.6	45.5	14.2	10.3	5.1	0.0	20.8	0.0	34.6	17.5	56.8
	B	96.2	46.8	0.0	10.5	11.9	35.9	33.6	205.4	357.3	226.4	20.8	48.9	97.7	159.4	104.3	29.4	7.8	86.6
	MEAN	310.8	37.5	12.1	10.4	21.0	60.3	75.4	158.2	160.7	87.6	36.3	32.2	33.9	84.8	38.4	26.4	18.0	69.6
AUG 29-30	S	112.8	55.8	47.6	0.0	153.7	239.5	101.6	209.0	123.2	51.2	25.1	152.8	250.7	135.3	3.9	72.3	72.7	104.7
	M	15.4	43.7	32.2	0.0	230.6	338.6	110.1	142.0	119.8	22.4	35.2	332.3	296.4	158.0	422.7	180.9	112.7	155.0
	B	73.1	34.2	72.7	54.7	180.6	617.7	172.2	714.4	689.3	353.5	435.3	245.0	441.2	479.8	353.1	65.0	25.9	290.4
	MEAN	67.1	44.5	50.8	18.2	188.3	398.6	127.9	355.1	310.8	142.4	165.2	243.4	329.4	257.7	259.9	106.0	70.4	183.3
SEP 6-7	S	50.6	564.5	567.1	121.9	244.4	447.0	332.6	150.3	202.2	303.4	83.7	82.1	17.7	139.9	68.8	59.7	65.2	201.9
	M	30.4	382.1	491.4	103.1	181.7	207.4	232.7	85.8	94.2	65.2	18.9	44.1	3.9	52.0	8.2	20.0	27.7	117.6
	B	19.6	338.5	220.6	34.5	64.4	210.4	148.0	159.5	114.1	26.4	72.9	75.6	8.6	76.2	36.7	9.3	7.5	93.2
	MEAN	33.6	428.4	426.4	86.5	163.5	288.2	237.8	131.9	136.8	131.6	58.5	67.3	10.0	89.4	37.9	29.6	33.5	137.6
SEP 12	S	27.1	28.2	117.7	36.8	16.2	30.6	42.8	12.4	22.2	105.9	51.9	25.9	8.2	37.8	27.0	11.5	0.0	34.8
	M	4.9	44.8	199.2	36.4	26.0	10.2	53.6	28.2	52.9	76.1	24.0	44.7	0.0	37.7	39.4	8.4	4.6	40.0
	B	15.9	75.4	63.2	9.9	44.7	19.0	38.0	38.3	46.8	45.7	32.5	9.2	16.6	31.5	40.8	4.0	8.0	31.3
	MEAN	16.0	49.4	126.7	27.7	28.9	19.9	44.8	26.3	40.6	75.9	36.1	26.6	8.2	35.6	35.7	7.9	4.2	35.4

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-26

ABUNDANCE[1] OF ALEWIFE POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No alewife postlarvae were collected in day samples during Apr and May 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUN 14	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUN 20	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	No Catch			0
	M	0	0	0	0	0	0	0	0	4.6	4.0	0	0	0	1.4				0.6
	B	0	0	3.6	0	0	0	0.6	0	0	0	0	0	0	0				0.2
	MEAN	0	0	1.2	0	0	0	0.2	0	1.5	1.3	0	0	0	0.5				0.3
JUN 27	S	0	18.4	20.3	19.7	0	4.4	10.5	13.8	14.0	20.6	28.2	0	0	12.8	13.4	15.5	10.2	11.9
	M	0	0	4.2	0	0	0	0.7	0	0	3.6	3.9	0	0	1.2	0	0	0	0.8
	B	0	0	4.1	0	0	0	0.7	4.2	0	3.6	0	0	5.2	2.2	0	0	0	1.1
	MEAN	0	6.1	9.5	6.6	0	1.5	4.0	6.0	4.7	9.3	10.7	0	1.7	5.4	4.5	5.2	3.4	4.6
JUL 9	S	449.7	16.9	296.1	56.7	36.7	16.7	145.5	82.2	462.8	37.8	36.8	40.2	53.6	118.9	0	3.7	0	106.0
	M	155.8	122.9	275.0	24.0	110.3	107.8	132.6	8.4	8.4	16.4	5.8	0	44.2	13.9	11.7	3.4	3.2	59.8
	B	153.9	74.1	37.5	3.4	62.3	43.8	62.5	22.9	15.7	8.4	4.4	0	31.1	13.8	0	0	0	30.5
	MEAN	253.1	71.3	202.8	28.0	69.8	56.1	113.5	37.8	162.3	20.9	15.7	13.4	43.0	48.8	3.9	2.4	1.1	65.4
JUL 13-15	S	161.2	95.1	515.1	168.7	28.0	62.2	171.7	424.0	136.5	631.5	74.1	78.4	72.8	236.2	40.5	975.3	1148.6	307.5
	M	122.4	31.2	92.5	45.4	49.9	24.3	61.0	105.3	23.0	84.9	11.4	28.5	18.7	45.3	27.9	98.8	126.2	59.4
	B	27.2	9.6	42.5	5.8	5.8	15.9	17.8	13.5	28.5	39.2	0	9.3	0	15.1	23.0	111.3	20.8	23.5
	MEAN	103.6	45.3	216.7	73.3	27.9	34.1	83.5	180.9	62.7	251.9	28.5	38.7	30.5	98.9	30.5	395.1	431.9	130.1
JUL 18	S	922.6	1446.4	6600.1	822.2	1016.4	2240.8	2174.8	70.8	518.0	1204.6	1261.4	873.2	1279.4	867.9	1617.4	37.4	21.2	1328.8
	M	398.2	224.2	4564.3	450.5	260.4	1752.0	1274.9	123.9	161.5	461.1	262.4	421.3	241.5	278.6	787.8	48.5	44.4	680.1
	B	194.0	100.7	525.1	67.1	109.4	169.6	194.3	34.6	77.8	84.4	90.0	82.2	154.3	87.2	105.6	9.4	5.3	120.6
	MEAN	504.9	590.4	3896.5	446.6	462.0	1387.5	1214.7	76.4	252.4	583.4	537.9	458.9	558.4	411.2	836.9	31.8	23.6	709.8
JUL 28-29	S	2967.3	788.5	2955.6	439.0	898.0	889.1	1489.6	786.5	707.8	2573.9	391.1	487.1	217.6	860.7	1221.2	5546.6	3228.8	1606.5
	M	4798.5	1298.5	5569.9	806.0	1470.8	1851.7	2632.6	138.9	712.8	1862.6	54.0	95.7	64.7	488.1	2100.1	189.9	143.1	1410.5
	B	117.7	157.9	2083.6	29.6	122.2	315.8	471.1	224.0	55.8	117.7	75.6	53.0	37.9	94.0	126.9	161.1	113.1	252.8
	MEAN	2627.8	748.3	3536.4	424.8	830.4	1018.9	1531.1	383.1	492.1	1518.1	173.6	212.0	106.7	480.9	1149.4	1965.9	1161.7	1090.0

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-27

ABUNDANCE[1] OF ALEWIFE POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
AUG 1-2	S	1514.1	2098.5	8701.9	413.4	309.1	586.5	2270.6	1192.7	2102.5	1374.4	710.9	643.6	752.5	1129.4	131.1	224.4	185.1	1396.0
	M	1806.6	2926.9	2242.5	636.2	482.9	529.5	1437.4	2076.2	2534.9	742.4	46.4	570.8	428.0	1066.5	8.0	24.8	21.2	1005.2
	B	411.8	2708.4	2371.9	83.6	142.3	305.9	1004.0	240.6	225.6	171.1	26.3	43.3	181.2	148.0	26.9	131.0	107.8	478.5
	MEAN	1244.2	2578.0	4438.7	377.7	311.4	474.0	1570.7	1169.8	1621.0	762.6	261.2	419.2	453.9	781.3	55.4	126.7	104.7	959.9
AUG 8-9	S	13.1	18.8	264.3	32.5	204.9	174.6	118.0	14.5	14.1	180.0	57.2	66.8	137.8	78.4	210.2	1151.6	28.3	171.2
	M	8.8	28.0	122.2	71.3	29.9	144.4	67.4	45.7	24.6	441.2	36.4	41.8	505.8	182.6	0	111.6	72.5	112.3
	B	29.7	26.8	172.2	10.8	60.4	45.0	57.5	28.4	14.2	189.3	22.2	NS	42.8	59.4	14.4	NS	31.6	52.9
	MEAN	17.2	24.5	186.2	38.2	98.4	121.3	81.0	29.5	17.6	270.2	38.6	54.3	228.8	106.5	74.8	631.6	44.2	125.0
AUG 15	S	63.0	46.9	411.4	17.8	0	0	89.9	1070.1	794.8	781.6	23.5	23.0	95.5	464.8	66.9	223.5	22.9	242.7
	M	25.1	39.9	319.8	13.1	0	0	66.3	443.5	785.9	242.0	8.1	32.4	0	252.0	4.3	7.8	3.8	128.4
	B	16.9	4.4	35.3	4.4	0	0	10.2	29.8	43.4	119.0	0	0	28.8	36.8	20.3	33.9	10.5	23.1
	MEAN	35.0	30.4	255.5	11.8	0	0	55.4	514.5	541.3	380.9	10.5	18.4	41.4	251.2	30.5	88.4	12.4	131.4
AUG 24	S	32.2	71.7	98.7	296.5	492.1	213.9	200.8	16.0	94.5	104.9	354.2	67.1	250.6	147.9	253.4	68.5	100.4	167.6
	M	16.5	111.3	87.6	163.5	393.2	98.5	145.1	0	15.8	5.2	29.6	0	35.0	14.3	58.7	4.5	0	68.0
	B	0	10.2	21.0	40.0	59.6	18.4	24.9	5.3	5.0	24.8	18.1	16.7	29.0	16.5	7.8	4.0	3.6	17.6
	MEAN	16.2	64.4	69.1	166.7	315.0	110.3	123.6	7.1	38.5	45.0	134.0	27.9	104.9	59.6	106.6	25.7	34.6	87.4
AUG 31	S	25.1	27.6	24.5	11.2	4.7	28.9	20.3	42.3	44.1	3.6	23.8	4.4	23.4	23.6	53.8	58.1	39.6	27.7
	M	25.9	34.6	4.9	22.4	39.4	46.4	28.9	35.9	25.6	8.3	14.7	3.5	26.5	19.1	0	0	3.9	19.5
	B	0	14.9	0	12.1	0	9.9	6.2	8.4	4.2	12.2	0	0	0	4.1	4.6	4.2	9.8	5.4
	MEAN	17.0	25.7	9.8	15.2	14.7	28.4	18.5	28.8	24.6	8.0	12.8	2.6	16.6	15.6	19.5	20.8	17.8	17.5
SEP 7	S	0	0	20.6	365.4	21.9	13.1	70.2	0	16.0	4.1	8.4	0	8.3	6.1	4.4	0	0	30.8
	M	10.9	4.9	0	11.0	0	0	4.5	0	0	0	0	0	5.0	0.8	0	4.3	0	2.4
	B	0	4.7	5.6	5.2	0	0	2.6	4.2	0	0	0	0	0	0.7	0	0	0	1.3
	MEAN	3.6	3.2	8.7	127.2	7.3	4.4	25.7	1.4	5.3	1.4	2.8	0	4.5	2.6	1.5	1.4	0	11.5
SEP 12	S	9.3	37.6	9.4	0	4.3	0	10.1	0	0	0	0	0	0	0	0	0	0	4.0
	M	16.6	31.4	10.4	0	5.2	0	10.6	0	0	0	0	0	0	0	0	0	0	4.2
	B	5.5	11.1	0	0	0	0	2.8	0	0	0	0	0	0	0	0	0	0	1.1
	MEAN	10.4	26.7	6.6	0	3.2	0	7.8	0	0	0	0	0	0	0	0	0	0	3.1
SEP 20	S	0	5.5	13.1	0	7.7	3.8	5.0	0	0	0	3.8	3.9	3.1	1.8	0	0	0	2.7
	M	0	0	8.9	0	4.2	11.5	4.1	0	0	4.8	4.1	0	0	1.5	0	0	0	2.2
	B	0	6.3	0	0	0	3.3	1.6	0	4.3	4.3	0	0	0	1.4	0	0	0	1.2
	MEAN	0	3.9	7.3	0	4.0	6.2	3.6	0	1.4	3.0	2.7	1.3	1.0	1.6	0	0	0	2.1
SEP 26	S			No Catch							No Catch						No Catch		
	M																		
	B																		
	MEAN																		

[1]Number per 1000 m^3

[2]S = surface, m = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-28

ABUNDANCE[1] OF ALEWIFE POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No alewife postlarvae were collected in day samples after mid-Nov 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
OCT 5	S	16.2	13.0	3.4	3.8	14.8	11.0	10.4	0	0	0	0	3.6	3.0	1.1				4.6
	M	26.0	13.1	3.7	15.0	8.1	24.2	15.0	0	0	0	0	0	0	0		No Catch		6.0
	B	27.8	4.7	4.0	0	0	0	6.1	0	0	0	0	4.8	0	0.8				2.8
	MEAN	23.3	10.2	3.7	6.3	7.6	11.7	10.5	0	0	0	0	2.8	1.0	0.6				4.4
OCT 11	S	0	0	0	3.9	3.7	4.0	1.9	0	0	0	0	8.1	7.8	2.6	4.0	3.7	0	2.3
	M	9.3	4.3	0	0	15.6	9.6	6.5	4.8	25.3	0	4.6	0	12.7	7.9	0	0	0	5.7
	B	0	0	0	0	4.4	9.8	2.4	0	0	0	0	0	4.3	0.7	0	0	0	1.2
	MEAN	3.1	1.4	0	1.3	7.9	7.8	3.6	1.6	8.4	0	1.5	2.7	8.3	3.8	1.3	1.2	0	3.1
OCT 18-23	S	0	0	0	17.0	12.7	12.4	7.0	0	0	0	4.1	0	6.6	1.8	0	0	0	3.5
	M	NS	NS	NS	58.9	5.6	24.5	29.7	NS	NS	NS	10.1	0	0	3.4	NS	NS	NS	16.5
	B	NS	NS	NS	4.8	10.6	0	5.1	NS	NS	NS	5.0	0	3.9	3.0	NS	NS	NS	4.0
	MEAN	0	0	0	26.9	9.6	12.3	12.2	0	0	0	6.4	0	3.5	2.5	0	0	0	6.5
OCT 24-25	S	0	0	0	0	4.8	0	0.8	0	0	0	0	0	0	0	0	0	0	0.3
	M	0	4.2	0	0	10.1	0	2.4	4.5	0	0	0	0	6.6	1.8	4.1	0	0	2.0
	B	5.3	0	5.0	0	4.7	0	2.5	9.3	0	0	0	0	0	1.5	0	0	0	1.6
	MEAN	1.8	1.4	1.7	0	6.5	0	1.9	4.6	0	0	0	0	2.2	1.1	1.4	0	0	1.3
OCT 31	S	0	0	0	0	3.8	0	0.6	4.2	0	0	0	4.0	0	1.4	0	0	0	0.8
	M	0	0	0	4.1	4.1	3.8	2.0	4.4	0	0	0	0	0	0.7	8.3	4.4	0	1.9
	B	0	0	4.6	4.3	0	0	1.5	0	0	0	4.5	0	0	0.8	0	0	0	0.9
	MEAN	0	0	1.5	2.8	2.6	1.5	1.4	2.9	0	0	1.5	1.3	0	1.0	2.8	1.5	0	1.2
NOV 7-8	S	0	0	0	0	0	0	0	0	7.9	0	0	0	3.8	1.9	3.4	0	0	1.0
	M	0	0	4.9	0	4.6	0	1.5	0	0	0	0	0	0	0	0	0	0	0.6
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEAN	0	0	1.6	0	1.5	0	0.5	0	2.6	0	0	0	1.3	0.6	1.1	0	0	0.5
NOV 14	S	4.3	0	7.1	0	0	0	1.9	0	4.1	4.3	0	0	0	1.4	0	0	0	1.3
	M	0	5.0	0	0	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0.3
	B	0	5.1	0	0	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0.3
	MEAN	1.4	3.4	2.4	0	0	0	1.2	0	1.4	1.4	0	0	0	0.5	0	0	0	0.6

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, due to weather and boat problems

Table E-29

ABUNDANCE[1] OF ALEWIFE POSTLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
JUN 11-12	S[2]	No Catch							0	5.4	0	0	0	0	0.9	No Catch			0.4
	M								0	0	0	0	0	0	0				0
	B								0	0	0	0	0	0	0				0
	MEAN								0	1.8	0	0	0	0	0.3				0.1
JUN 13-14	S	0	0	0	4.8	0	0	0.8	No Catch							No Catch			0.3
	M	0	0	0	0	0	0	0											0
	B	0	0	0	0	0	0	0											0
	MEAN	0	0	0	1.6	0	0	0.3											0.1
JUN 22-23	S	4.2	0	4.3	4.6	0	0	2.2	0	3.9	3.8	0	0	0	1.3	No Catch			1.4
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	MEAN	1.4	0	1.4	1.5	0	0	0.7	0	1.3	1.3	0	0	0	0.4				0.5
JUN 27-28	S	4.2	0	0	0	21.9	4.4	5.1	4.3	0	0	4.4	8.7	4.3	3.6	0	0	0	3.5
	M	0	0	0	0	0	9.7	1.6	0	0	0	0	8.9	0	1.5	3.9	0	0	1.5
	B	0	0	0	0	7.7	19.7	4.6	0	0	0	0	0	3.7	0.6	0	0	0	2.1
	MEAN	1.4	0	0	0	9.9	11.3	3.8	1.4	0	0	1.5	5.9	2.7	1.9	1.3	0	0	2.4
JUL 7	S	0	4.7	0	10.6	0	0	2.6	0	0	0	21.5	0	24.9	7.7	9.7	28.8	0	6.7
	M	0	0	0	0	3.7	0	.6	0	0	0	3.6	3.3	6.0	2.2	2.2	0	1.6	1.4
	B	0	5.8	0	0	4.1	7.8	3.0	2.3	0	0	3.4	5.6	2.7	2.3	4.6	0	0	2.4
	MEAN	0	3.5	0	3.5	2.6	2.6	2.0	0.8	0	0	9.5	3.0	11.2	4.1	5.5	9.6	0.6	4.3
JUL 14-15	S	2388.4	1216.6	872.9	903.9	535.9	382.5	1050.0	2659.4	1897.8	2009.0	3951.9	2451.7	3011.5	2663.6	353.9	970.1	453.0	1603.9
	M	1002.9	416.0	529.4	226.0	115.7	309.5	433.3	382.6	484.2	365.0	264.7	235.4	476.8	368.1	95.7	80.7	36.7	334.8
	B	162.7	182.1	84.5	45.2	70.4	97.2	107.0	82.7	204.2	235.7	274.7	192.4	298.0	214.6	99.4	38.8	7.1	138.3
	MEAN	1184.6	604.9	495.6	391.7	240.6	263.1	530.1	1041.6	862.1	869.9	1497.1	959.8	1262.1	1082.1	183.0	363.2	165.6	692.3
JUL 18-19	S	79.6	418.2	310.2	198.2	923.9	521.3	408.6	212.4	498.2	473.1	386.9	1855.9	2317.1	957.3	764.2	4434.8	889.7	952.2
	M	236.8	420.8	194.4	263.8	882.6	893.3	482.0	500.0	280.1	348.8	85.7	517.6	601.1	388.9	422.3	680.9	410.7	449.3
	B	178.9	142.9	257.2	9.8	281.9	213.7	180.7	77.3	67.8	71.7	437.1	110.6	323.6	181.4	195.2	438.5	91.6	193.2
	MEAN	165.1	327.3	253.9	157.2	696.1	542.8	357.1	263.2	282.0	297.9	303.2	828.0	1080.6	509.2	460.6	1851.4	464.0	531.6
JUL 28-29	S	2811.0	6108.5	4987.4	1291.1	2539.4	5171.3	3818.1	2023.5	655.2	3580.0	451.6	1523.2	363.8	1432.9	235.0	163.0	86.4	2132.7
	M	2991.2	2936.9	5803.0	1288.7	2307.0	3000.9	3054.6	2157.8	882.5	2385.7	744.3	768.2	268.3	1201.1	352.9	418.5	459.1	1784.3
	B	2378.0	2850.0	6057.8	759.7	5067.1	4715.5	3638.0	3124.5	2385.7	6244.4	984.3	1676.8	666.0	2513.6	1712.7	282.0	126.5	2602.1
	MEAN	2726.7	3965.1	5616.1	1113.2	3304.5	4295.9	3503.6	2435.3	1307.8	4070.0	726.7	1322.8	432.7	1715.9	766.9	287.8	224.0	2173.0

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-30

ABUNDANCE[1] OF ALEWIFE POSTLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
AUG 2-3	S[2]	2037.5	1758.8	514.0	1476.0	2404.7	3883.8	2012.5	347.0	414.6	621.1	797.4	806.9	2176.1	860.5	889.8	1057.8	1685.0	1391.4
	M	1046.0	1959.7	1165.6	1375.6	2219.3	5080.4	2141.1	283.8	191.6	167.0	731.0	340.2	1073.6	464.5	762.5	683.4	638.4	1181.2
	B	83.2	728.2	518.9	686.0	1395.6	1624.0	839.5	29.0	373.1	441.9	646.0	1133.1	1299.5	653.8	1425.9	405.8	743.5	769.0
	MEAN	1055.6	1482.2	732.8	1179.5	2006.6	3529.4	1664.3	219.9	326.4	410.0	724.8	760.1	1516.4	659.6	1026.0	715.7	1022.3	1113.8
AUG 8-9	S	NS	NS	NS	4705.2	1212.8	1398.9	2439.0	971.0	219.6	NS	NS	1719.1	2447.4	1339.3	NS	2393.8	2424.8	1943.6
	M	NS	NS	NS	3273.4	NS	514.2	1893.8	242.9	76.7	NS	135.4	2067.3	1689.7	842.4	259.3	NS	45.6	922.7
	B	46.9	83.1	2763.3	1629.6	1133.7	891.7	1091.4	320.3	60.0	NS	568.2	1154.0	1588.9	738.3	1588.8	1521.4	1409.0	1054.2
	MEAN	46.9	83.1	2763.3	3202.7	1173.2	934.9	1640.8	511.4	118.8	-	351.8	1646.8	1908.7	947.3	924.0	1957.6	1293.1	1267.4
AUG 15-16	S	245.5	174.2	72.5	124.6	1061.8	109.5	298.0	21.3	293.6	94.3	88.9	496.1	520.0	252,4	58.9	165.3	77.3	240.3
	M	88.1	128.8	39.0	93.8	378.0	21.9	124.9	31.1	169.7	29.4	54.1	231.7	486.2	167.0	122.1	1089.6	280.1	216.2
	B	60.4	116.3	51.4	68.3	368.5	232.3	149.5	164.5	229.7	113.4	109.1	406.4	292.1	219.2	140.8	124.4	46.2	168.3
	MEAN	131.3	139.8	54.3	95.6	602.8	121.3	190.8	72.3	231.0	79.0	84.0	378.0	432.8	212.9	107.3	459.8	134.5	208.2
AUG 25-26	S	293.5	39.1	11.4	16.5	29.9	78.1	78.1	219.6	75.0	22.1	69.9	42.6	0	71.5	11.0	15.3	25.1	63.3
	M	531.1	26.8	24.8	0	21.1	67.0	111.8	49.6	45.5	14.2	10.3	5.1	0	20.8	0	29.6	17.5	56.2
	B	96.2	41.6	0	10.5	11.9	35.9	32.7	201.4	320.0	212.3	20.8	48.9	92.6	149.3	90.7	25.2	7.8	81.1
	MEAN	306.9	35.8	12.1	9.0	21.0	60.3	74.2	156.9	146.8	82.9	33.7	32.2	30.8	80.6	33.9	23.4	16.8	66.8
AUG 29-30	S	112.8	55.8	43.6	0	153.7	239.5	100.9	209.1	123.2	51.2	20.9	144.3	229.1	129.6	3.9	68.4	69.0	101.6
	M	15.4	43.7	32.3	0	225.1	338.6	109.2	136.3	119.8	22.4	35.2	320.2	296.4	155.1	409.3	175.1	108.0	151.9
	B	73.1	34.2	63.6	54.7	180.6	605.6	168.6	703.9	684.1	339.8	435.3	220.5	430.3	469.0	140.0	55.0	25.9	269.8
	MEAN	67.1	44.5	46.5	18.3	186.4	394.6	126.2	349.7	309.0	137.8	163.8	228.3	318.6	251.2	184.4	99.5	67.7	174.4
SEP 6-7	S	43.4	564.5	559.5	121.9	240.6	447.0	329.5	150.3	191.0	303.4	80.1	77.8	17.7	136.7	68.8	59.7	65.3	199.4
	M	30.5	382.1	491.4	99.0	181.7	207.4	232.0	87.5	94.2	61.3	18.9	44.1	3.9	51.4	8.2	20.0	27.7	117.1
	B	19.6	338.5	220.6	34.5	64.4	210.4	148.0	155.7	110.2	22.0	72.9	69.8	8.6	73.2	36.7	9.3	7.5	92.0
	MEAN	31.2	428.4	423.8	85.2	162.2	288.3	236.5	130.6	131.8	128.9	57.3	63.9	10.1	87.1	37.9	29.7	33.5	136.2
SEP 12	S	22.6	23.5	117.7	36.8	16.2	30.7	41.3	12.4	22.2	105.9	51.9	25.9	8.2	37.8	23.2	11.5	0	33.9
	M	4.9	44.8	199.2	36.4	26.0	10.2	53.6	23.5	48.1	76.1	24.0	44.7	0	36.1	39.4	8.4	4.6	39.4
	B	15.9	70.3	63.2	9.9	44.7	19.0	37.2	38.3	46.8	41.2	32.5	9.2	12.4	30.1	32.6	0	4.0	29.3
	MEAN	14.5	46.2	126.7	27.7	29.0	20.0	44.0	24.8	39.0	74.4	36.1	26.6	6.9	34.6	31.7	6.6	2.9	34.2

[1]Number per 1000 m^3

[2]S = surface, m = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-31

ABUNDANCE[1] OF *MORONE* SP. POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No *Morone* sp. postlarvae were collected in day samples during Apr and May 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11	S[2]	0	0	4.9	5.0	0	0	1.6	0	0	0	0	0	0	0	0	0	0	0.7
	M	0	8.4	13.9	9.4	0	7.1	6.5	3.4	7.2	3.5	0	0	0	2.4	3.6	0	0	3.8
	B	8.0	0	8.7	0	7.6	3.6	4.6	9.4	0	0	0	0	0	1.6	0	0	0	2.5
	MEAN	2.7	2.8	9.2	4.8	2.5	3.6	4.3	4.3	2.4	1.2	0	0	0	1.3	1.2	0	0	2.3
JUN 14	S	0	0	0	3.3	4.3	4.8	2.1	0	4.2	0	0	0	0	0.7	0	0	0	1.1
	M	0	4.5	3.8	4.1	9.2	0	3.6	0	0	3.8	0	0	0	0.6	0	0	0	1.7
	B	0	0	11.8	16.4	15.2	0	7.2	0	3.6	0	0	3.8	0	1.2	3.3	0	0	3.6
	MEAN	0	1.5	5.2	7.9	9.6	1.6	4.3	0	2.6	1.3	0	1.3	0	0.9	1.1	0	0	2.1
JUN 20	S	0	0	0	0	0	0	0	0	0	0	5.0	5.7	0	1.8	No Catch			0.7
	M	0	3.6	0	0	0	0	0.6	0	4.6	0	0	8.1	0	2.1				1.1
	B	10.8	8.8	0	0	7.7	0	4.5	0	0	0	0	0	0	0				1.8
	MEAN	3.6	4.1	0	0	2.6	0	1.7	0	1.5	0	1.7	4.6	0	1.3				1.2
JUN 27	S	0	0	0	0	0	0	0	0	0	0	0	0	3.6	0.6	0	0	5.1	0.6
	M	0	0	4.2	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0.3
	B	0	0	4.1	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0.3
	MEAN	0	0	2.8	0	0	0	0.5	0	0	0	0	0	1.2	0.2	0	0	1.7	0.4
JUL 9	S	4.4	4.2	0	0	0	0	1.4	0	0	0	0	0	0	0	No Catch			0.6
	M	0	0	0	0	0	0	0	0	0	0	0	4.3	0	0.7				0.3
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0
	MEAN	1.5	1.4	0	0	0	0	0.5	0	0	0	0	1.4	0	0.2				0.3
JUL 13-15	S	0	0	4.6	0	0	0	0.8	4.9	0	4.6	0	0	0	1.6	No Catch			0.9
	M	0	0	8.4	0	0	0	1.4	8.4	7.7	4.0	0	0	0	3.4				1.9
	B	0	4.8	0	0	0	0	0.8	0	4.1	0	0	0	0	0.7				0.6
	MEAN	0	1.6	4.4	0	0	0	1.0	4.4	3.9	2.9	0	0	0	1.9				1.1
JUL 18	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M	0	0	0	9.3	5.2	0	2.4	0	0	0	0	0	4.9	0.8	0	0	3.0	1.5
	B	0	0	0	0	0	10.0	1.7	0	0	0	0	0	0	0	0	0	2.6	0.8
	MEAN	0	0	0	3.1	1.7	3.3	1.4	0	0	0	0	0	1.6	0.3	0	0	1.9	0.8
JUL 28-29	S	31.2	44.1	0	8.4	11.9	7.6	17.2	39.5	7.3	13.0	30.1	18.4	0	18.1	17.3	0	10.9	16.0
	M	85.4	97.8	15.4	9.1	42.5	43.5	49.0	11.6	77.9	8.4	14.7	21.8	0	22.4	25.5	14.3	28.6	33.1
	B	73.1	105.3	41.0	44.4	56.7	51.9	62.1	14.9	25.8	0	55.5	32.6	8.4	22.9	16.9	7.3	3.5	35.8
	MEAN	63.2	82.4	18.8	20.6	37.1	34.3	42.7	22.0	37.0	7.1	33.4	24.3	2.8	21.1	19.9	7.2	14.3	28.3

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-32

ABUNDANCE[1] OF *MORONE* SP. POSTLARVAE IN DAY ICHTHOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No *Morone* sp. postlarvae were collected in day samples after Aug 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
AUG 1-2	S	10.1	6.5	24.7	6.6	0	3.2	8.5	3.1	0	3.3	0	7.2	3.2	2.8	3.2	0	0	4.7
	M	0	0	54.3	3.8	3.8	0	10.3	0	0	55.9	0	0	3.9	10.0	16.1	4.1	3.5	9.7
	B	53.1	25.0	65.9	86.7	16.3	13.7	43.5	28.1	20.5	110.5	13.2	28.9	4.3	34.3	13.4	9.7	3.9	32.9
	MEAN	21.1	10.5	48.3	32.4	6.7	5.6	20.8	10.4	6.8	56.6	4.4	12.0	3.8	15.7	10.9	4.6	2.5	15.8
AUG 8-9	S	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.0	0.3
	B	0	0	0	0	0	10.0	1.7	0	3.5	0	0	NS	0	0.6	0	NS	0	1.0
	MEAN	0	0	0	0	0	3.3	0.6	0	1.2	0	0	0	0	0.2	0	0	1.3	0.4
AUG 15	S	No Catch							0	0	0	0	0	0	0	0	0	0	0
	M								0	0	0	0	0	0	0	0	0	0	0
	B								0	4.3	8.5	0	0	0	2.1	0	0	0	0.9
	MEAN								0	1.5	2.8	0	0	0	0.7	0	0	0	0.3
AUG 24	S M B MEAN	No Catch							No Catch							No Catch			
AUG 31	S M B MEAN	No Catch							No Catch							No Catch			

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-33

ABUNDANCE[1] OF *MORONE* SP. POSTLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
JUN 11-12	S[2]	38.0	15.5	21.1	0	0	6.6	13.5	11.0	5.4	0	0	0	0	2.7	No Catch			6.5
	M	26.7	5.1	13.0	0	0	0	7.5	9.3	0	11.9	0	0	0	3.5				4.4
	B	0	6.5	5.2	4.2	0	0	2.6	4.2	4.8	7.0	3.4	0	0	3.2				2.4
	MEAN	21.6	9.0	13.1	1.4	0	2.2	7.9	8.2	3.4	6.3	1.1	0	0	3.2				4.4
JUN 13-14	S	15.6	4.9	4.8	23.8	19.8	35.3	17.4	20.0	0	9.0	4.5	4.6	9.3	7.9	17.0	0	5.2	11.6
	M	3.2	3.3	3.5	0	7.2	22.0	6.5	0	9.6	3.3	19.4	6.4	0	6.3	6.2	0	0	5.6
	B	4.7	0	0	0	6.3	16.1	4.5	3.3	0	10.2	0	0	0	2.2	0	0	0	2.7
	MEAN	7.8	2.7	2.8	7.9	11.1	24.5	9.5	7.8	3.2	7.5	8.0	3.7	3.1	5.5	7.7	0	1.7	6.6
JUN 22-23	S	0	0	4.3	4.6	4.8	4.5	3.0	4.4	0	3.8	8.6	4.1	0	3.5	No Catch			2.6
	M	0	2.3	12.9	0	0	0	2.5	4.7	3.4	0	0	0	0	1.4				1.6
	B	0	0	0	4.4	0	3.8	1.4	0	0	0	0	10.0	2.9	2.2				1.4
	MEAN	0	0.8	5.7	3.0	1.6	2.8	2.3	3.0	1.1	1.3	2.9	4.7	1.0	2.3				1.9
JUN 27-28	S	0	0	0	0	0	0	0	0	0	0	0	0	4.3	0.7	4.5	0	4.3	0.9
	M	0	0	8.7	0	0	0	1.4	0	0	0	0	4.5	4.4	1.5	3.9	0	0	1.4
	B	0	0	0	0	0	0	0	0	0	0	0	0	3.7	0.6	0	0	0	0.2
	MEAN	0	0	2.9	0	0	0	0.5	0	0	0	0	1.5	4.1	0.9	2.8	0	1.4	0.8
JUL 7	S	0	0	0	5.3	0	5.0	1.7	0	0	0	0	5.3	0	0.9	0	4.8	0	1.4
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	B	0	0	0	0	4.2	0	0.7	0	0	0	0	0	0	0	0	0	0	0.3
	MEAN	0.	0	0	1.8	1.4	1.6	0.8	0	0	0	0	1.8	0	0.3	0	1.6	0	0.5
JUL 14-15	S	5.1	0	0	0	0	0	0.9	0	0	0	0	4.4	0	0.7	0	9.2	4.6	1.6
	M	4.9	0	0	0	0	5.2	1.7	0	0	0	0	0	0	0	3.8	0	0	0.9
	B	0	0	0	0	0	5.4	0.9	0	0	0	0	0	0	0	0	0	0	0.4
	MEAN	3.3	0	0	0	0	3.6	1.2	0	0	0	0	1.5	0	0.2	1.3	3.1	1.5	1.0
JUL 18-19	S	4.2	0	0	0	15.7	0	3.3	4.0	8.0	0	7.6	0	0	3.3	18.3	0	3.6	4.1
	M	13.9	5.0	3.7	0	0	0	3.8	12.7	22.2	5.1	0	4.0	3.6	7.9	3.1	6.4	0	5.3
	B	0	8.7	0	0	0	0	1.5	7.0	0	3.3	10.7	3.6	0	4.1	0	0	0	2.2
	MEAN	6.0	4.5	1.2	0	5.2	0	2.8	7.9	10.1	2.8	6.1	2.5	1.2	5.1	7.1	2.1	1.2	3.9
JUL 28-29	S	27.6	24.4	87.0	64.2	12.2	0	35.9	30.8	18.0	94.2	3.2	5.6	33.1	30.8	14.0	0	37.0	30.1
	M	40.3	0	83.1	75.3	125.8	56.4	63.5	60.4	7.3	47.1	42.6	49.6	134.1	56.9	20.8	18.2	24.7	52.4
	B	130.5	59.7	234.9	110.2	212.5	126.0	145.6	100.0	46.8	90.9	41.2	70.8	37.4	64.5	30.4	7.4	0	86.6
	MEAN	66.1	28.7	135.0	83.2	116.8	60.8	81.8	63.7	24.0	77.4	29.0	42.0	68.2	50.7	21.7	8.5	20.6	56.4

[1]Number per 1000 m3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-34

ABUNDANCE[1] OF *MORONE* SP. POSTLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
AUG 2-3	S[2]	7.4	15.0	10.6	22.3	0	86.0	23.6	0	17.0	22.8	6.3	24.6	5.9	12.8	10.2	5.9	4.8	15.9
	M	0	8.8	17.5	31.5	0	51.0	18.1	20.9	8.5	28.5	17.0	4.4	19.8	16.5	73.8	28.6	5.8	21.1
	B	0	51.1	36.2	40.9	135.6	23.8	47.9	8.3	19.0	30.5	54.9	41.7	37.1	31.9	6.9	16.2	2.7	33.7
	MEAN	2.5	25.0	21.4	31.6	45.2	53.6	29.9	9.7	14.8	27.3	26.1	23.6	20.9	20.4	30.3	16.9	4.4	23.6
AUG 8-9	S	NS	NS	NS	0	7.2	0	2.4	0	0	NS	NS	0	12.7	3.2	NS	0	0	2.2
	M	NS	NS	NS	0	NS	7.9	4.0	3.9	0	NS	7.1	8.1	8.2	5.5	18.5	NS	0	4.5
	B	17.0	0	14.1	9.3	33.1	7.5	13.5	3.6	0	NS	0	26.2	0	6.0	0	0	0	7.9
	MEAN	17.0	0	14.1	3.1	20.2	5.1	8.7	2.5	0	-	3.6	11.4	7.0	5.0	9.2	0	0	5.3
AUG 15-16	S	0	0	0	0	0	0	0	0	0	3.5	0	0	0	0.6	0	0	0	0.2
	M	0	0	0	0	0	8.8	1.5	0	0	0	0	0	0	0	0	0	0	0.6
	B	0	0	5.1	0	0	0	0.9	0	0	0	0	0	0	0	4.5	0	0	0.6
	MEAN	0	0	1.7	0	0	2.9	0.8	0	0	1.2	0	0	0	0.2	1.5	0	0	0.5
AUG 25-26	S, M, B, MEAN	No Catch							No Catch							No Catch			
AUG 29-30	S, M, B, MEAN	No Catch							No Catch							No Catch			
SEP 6-7	S, M, B, MEAN	No Catch							No Catch							No Catch			
SEP 12	S, M, B, MEAN	No Catch							No Catch							No Catch			

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-35

ABUNDANCE[1] OF RAINBOW SMELT POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
APR 10	S	No Samples Taken Due to Weather							0	No Samples Taken Except Surface and Mid-Depth at 3-West Due to Weather						No Samples Taken Due to Weather			
	M								0										
	B																		
	MEAN								0.0										
APR 15-16	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
APR 18	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
APR 30 MAY 1	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
MAY 3	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
MAY 11	S	0	3.6	0	0	0	0	0.6	No Catch							No Catch			0.2
	M	0	0	3.6	0	0	0	0.6											0.2
	B	0	0	0	0	0	0	0.0											0.0
	MEAN	0	1.2	1.2	0	0	0	0.4											0.1
MAY 16	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
MAY 23	S	0	0	0	0	0	0	0.0	0	0	0	5.2	0	0	0.9	0	0	4.2	0.6
	M	4.2	0	0	0	0	0	0.7	0	0	3.1	0	3.3	0	1.1	0	3.6	0	0.9
	B	0	0	0	9.6	0	0	1.6	0	0	0	0	0	0	0.0	0	0	0	0.6
	MEAN	1.4	0	0	3.2	0	0	0.8	0	0	1.0	1.7	1.1	0	0.7	0	1.2	1.4	0.7
MAY 31	S	0	0	0	0	0	0	0.0	0	0	0	0	0	4.3	0.7	0	0	0	0.3
	M	0	0	3.3	0	0	0	0.6	0	0	0	0	0	5.8	1.0	0	2.9	2.9	1.0
	B	0	0	0	0	0	0	0.0	0	3.6	0	0	0	3.9	1.3	0	0	3.0	0.7
	MEAN	0	0	1.1	0	0	0	0.2	0	1.2	0	0	0	4.7	1.0	0	1.0	2.0	0.7

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-36

ABUNDANCE[1] OF RAINBOW SMELT POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
JUN 11	S	0	0	0	0	0	5.1	0	0	0	0	0	0	0	0	0	0	0	0.3
	M	0	4.2	4.6	18.8	4.0	0	5.3	3.4	0	3.5	4.0	0	0	1.8	0	0	3.2	3.0
	B	4.0	0	0	16.5	3.8	0	4.0	6.3	3.0	2.9	17.3	14.6	2.7	7.8	0	2.7	5.8	5.3
	MEAN	1.3	1.4	1.5	11.8	2.6	1.7	3.4	3.2	1.0	2.1	7.1	4.9	0.9	3.2	0	0.9	3.0	2.7
JUN 14	S	0	8.4	0	62.3	21.5	4.8	16.2	0	0	0	4.6	8.3	4.4	2.9	7.1	120.0	21.4	17.5
	M	0	22.4	18.8	103.5	18.4	21.3	30.7	3.5	0	3.8	7.9	36.0	0	8.5	10.2	11.3	26.3	18.9
	B	9.7	16.9	31.4	106.9	35.4	29.5	38.3	0	0	8.2	12.0	26.4	4.0	8.4	10.0	37.8	33.4	24.1
	MEAN	3.2	15.9	16.7	90.9	25.1	18.5	28.4	1.2	0	4.0	8.2	23.6	2.8	6.6	9.1	56.4	27.0	20.2
JUN 20	S	5.3	0	12.2	0	0	0	2.9	0	0	0	20.0	11.4	0	5.2	11.6	19.7	5.8	5.7
	M	26.5	0	37.9	45.0	13.9	10.6	22.3	7.3	9.2	0	20.0	52.8	40.5	21.6	20.7	7.1	13.0	20.3
	B	28.7	32.4	43.4	29.7	34.7	21.6	31.8	11.5	3.7	3.1	18.1	11.6	20.1	11.4	15.3	3.0	11.2	19.2
	MEAN	20.2	10.8	31.2	24.9	16.2	10.7	19.0	6.3	4.3	1.0	19.4	25.3	20.2	12.7	15.9	10.0	10.0	15.1
JUN 27	S	0	32.1	4.0	4.9	0	0	6.8	0	0	4.1	14.1	0	3.6	3.6	4.5	3.9	0	4.7
	M	40.8	4.6	29.6	0	3.6	10.3	14.8	12.7	4.3	32.6	3.9	3.7	27.3	14.0	18.9	12.3	9.1	14.2
	B	28.0	19.1	78.8	0	0	3.1	21.5	4.2	4.2	49.8	0	3.3	5.2	11.1	4.0	0	0	13.3
	MEAN	22.9	18.6	37.5	1.6	1.2	4.5	14.4	5.6	2.8	28.8	6.0	2.3	12.0	9.6	9.1	5.4	3.0	10.8
JUL 9	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUL 13-15	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUL 18	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
JUL 28-29	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		

[1]Number per 1000 m^3

[2]S = Surface, M = Mid-depth, B = Bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-37

ABUNDANCE[1] OF RAINBOW SMELT POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	40-FT CONTOUR[3] 3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
AUG 1-2	S	No Catch							0	0	0	0	0	0	0	0	0	0	0
	M								0	6.4	0	0	0	0	1.1	0	0	0	0.4
	B								0	0	0	0	0	0	0	0	0	0	0
	MEAN								0	2.1	0	0	0	0	0.4	0	0	0	0.1
AUG 3-9	S	No Catch							0	0	0	0	0	0	0	0	0	0	0
	M								0	0	0	0	0	0	0	0	0	0	0
	B								4.1	0	0	0	NS	0	0.8	0	NS	0	0.3
	MEAN								1.4	0	0	0	0	0	0.2	0	0	0	0.1
AUG 15	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
AUG 24	S	0	0	0	0	4.0	0	0.7	0	0	0	0	0	0	0	0	0	0	0.3
	M	0	5.1	0	0	0	0	0.9	0	5.3	0	0	0	0	0.9	0	0	0	0.7
	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	MEAN	0	1.7	0	0	1.3	0	0.5	0	1.8	0	0	0	0	0.3	0	0	0	0.3
AUG 31	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
SEP 7	S	No Catch							0	0	0	0	0	0	0	No Catch			0
	M								0	0	0	0	0	0	0				0
	B								4.2	0	0	0	0	0	0.7				0.3
	MEAN								1.4	0	0	0	0	0	0.2				0.1
SEP 12	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
SEP 20	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		
SEP 26	S	0	0	0	0	0	0	0	No Catch							No Catch			0
	M	0	0	0	0	0	4.7	0.8											0.3
	B	0	0	0	0	0	0	0											0
	MEAN	0	0	0	0	0	1.6	0.3											0.1

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

Table E-38

ABUNDANCE[1] OF RAINBOW SMELT POSTLARVAE IN DAY ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977
(No rainbow smelt postlarvae were collected in day samples after Oct 1977)

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
OCT 5	S M B MEAN	No Catch							No Catch							No Catch			
OCT 11	S M B MEAN	No Catch[4]							No Catch[4]							No Catch[4]			
OCT 18-23	S M B MEAN	No Catch							No Catch							No Catch			
OCT 24-25	S M B MEAN	No Catch							No Catch							No Catch			
OCT 31	S	No Catch							0	0	0	0	0	0	0	No Catch			0
	M								0	0	0	0	0	0	0				0
	B								0	4.4	0	0	0	0	0.7				0.3
	MEAN								0	1.5	0	0	0	0	0.2				0.1

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

[4]No mid-depth or bottom samples taken except at 1-East and 3-East on the 20 and 40 ft contours due to weather and boat problems

Table E-39

ABUNDANCE[1] OF RAINBOW SMELT POSTLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3] 3-WEST	20-FT 1-WEST	20-FT 1/2-WEST	20-FT 1/2-EAST	20-FT 1-EAST	20-FT 3-EAST	20-FT MEAN	40-FT CONTOUR[3] 3-WEST	40-FT 1-WEST	40-FT 1/2-WEST	40-FT 1/2-EAST	40-FT 1-EAST	40-FT 3-EAST	40-FT MEAN	60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
JUN 11-12	S	5.4	5.2	0	12.8	11.7	46.0	13.5	0	0	11.4	6.0	0	5.5	3.8	0	0	5.4	7.3
	M	4.5	0	17.3	3.4	3.9	7.8	6.1	9.3	0	4.0	10.5	6.5	7.3	6.3	21.0	0	5.3	6.7
	B	5.5	13.0	21.0	8.4	4.2	18.5	11.8	4.2	9.6	7.0	13.8	8.4	6.0	8.2	7.4	0	0	8.5
	MEAN	5.1	6.1	12.8	8.2	6.6	24.1	10.5	4.5	3.2	7.5	10.1	5.0	6.3	6.1	9.5	0	3.6	7.5
JUN 13-14	S	41.6	44.2	33.4	9.5	69.4	15.1	35.5	10.0	18.5	9.0	0	46.0	27.8	18.6	11.3	0	10.4	23.1
	M	16.2	29.5	21.0	7.7	57.3	47.2	29.8	20.0	16.1	23.1	27.2	16.0	67.0	28.2	24.8	17.2	40.2	28.7
	B	46.9	59.5	41.1	39.9	66.6	48.5	50.4	52.6	78.5	13.6	15.6	6.8	64.9	38.7	11.6	13.1	60.4	41.3
	MEAN	34.9	44.4	31.8	19.0	64.4	36.9	38.6	27.5	37.7	15.2	14.3	22.9	53.2	28.5	15.9	10.1	37.0	31.0
JUN 22-23	S	55.0	34.3	72.4	148.3	240.3	135.7	114.3	17.5	15.6	15.0	133.0	82.0	129.3	65.4	30.5	8.9	11.1	75.3
	M	42.1	2.3	93.8	183.7	340.7	202.1	144.1	4.7	10.3	10.2	11.8	51.7	118.7	34.6	6.3	30.6	18.5	75.1
	B	66.3	29.7	49.6	175.3	206.0	155.6	113.8	20.9	11.5	19.1	59.8	46.7	74.4	38.7	32.2	8.7	0	63.7
	MEAN	54.4	22.1	71.9	169.1	262.3	164.5	124.0	14.4	12.5	14.8	68.2	60.1	107.5	46.2	23.0	16.1	9.9	71.4
JUN 27-28	S	21.3	23.2	4.2	0	26.3	0	12.5	17.1	22.2	22.0	4.4	17.3	12.9	16.0	18.0	17.8	29.9	15.8
	M	28.5	22.3	30.5	0	41.9	19.4	23.8	14.0	35.7	27.4	8.0	120.8	83.7	48.3	31.1	10.6	6.9	32.0
	B	46.0	37.0	54.8	11.9	123.1	49.3	53.7	17.8	12.5	3.9	6.6	36.4	40.9	19.7	3.7	0	0	29.6
	MEAN	31.9	27.5	29.8	4.0	63.8	22.9	30.0	16.3	23.5	17.8	6.3	58.2	45.8	28.0	17.6	9.5	12.3	25.8
JUL 7	S	0	0	5.1	5.3	0	0	1.7	0	0	4.5	0	0	0	.8	9.7	4.8	0	2.0
	M	0	0	3.2	7.7	0	0	1.8	0	0	0	0	6.6	0	1.1	2.2	0	6.6	1.8
	B	0	2.9	2.9	15.1	0	0	3.5	2.3	4.8	4.6	13.5	2.8	0	4.7	0	0	1.7	3.4
	MEAN	0	1.0	3.8	9.4	0	0	2.3	0.8	1.6	3.0	4.5	3.1	0	2.2	4.0	1.6	2.8	2.4
JUL 14-15	S	0	0	0	0	0	0	0	0	0	0	0	0.	0	0	No Catch			0
	M	4.9	0	0	0	0	0	0.8	4.7	0	4.2	0	4.7	0	2.3				1.2
	B	10.2	20.8	6.0	0	5.4	0	7.1	0	5.1	4.7	0	5.2	0	2.5				3.8
	MEAN	5.0	6.9	2.0	0	1.8	0	2.6	1.6	1.7	3.0	0	3.3	0	1.6				1.7
JUL 18-19	S	No Catch							No Catch							0	0	0	0
	M															0	0	6.8	0.5
	B															0	0	0	0
	MEAN.															0	0	2.3	0.2
JUL 28-29	S	No Catch							No Catch							No Catch			
	M																		
	B																		
	MEAN																		

[1]Number per 1000 m^3

[2]S = surface, M = mid-depth, B = bottom

[3]Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

Table E-40

ABUNDANCE[1] OF RAINBOW SMELT POSTLARVAE IN NIGHT ICHTHYOPLANKTON COLLECTIONS, NINE MILE POINT VICINITY, 1977

DATE	SAMPLE DEPTH[2]	20-FT CONTOUR[3]							40-FT CONTOUR[3]							60-FT NMPP	80-FT NMPP	100-FT NMPP	GRAND MEAN
		3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN	3-WEST	1-WEST	1/2-WEST	1/2-EAST	1-EAST	3-EAST	MEAN				
AUG 2-3	S[2]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	M	0	0	4.4	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0.3
	B	0	0	0	0	0	0	0	0	0	0	4.2	0	0	0.7	13.7	0	0	1.2
	MEAN	0	0	1.5	0	0	0	0.2	0	0	0	1.4	0	0	0.2	4.6	0	0	0.5
AUG 8-9	S	NS	NS	NS	0	0	0	0	0	0	NS	NS	0	0	0	NS	0	0	0
	M	NS	NS	NS	0	NS	0	0	0	0	NS	0	0	0	0	0	NS	0	0
	B	0	0	0	0	0	0	0	0	0	NS	0	8.7	0	1.7	0	6.7	6.2	1.5
	MEAN	0	0	0	0	0	0	0	0	0	-	0	2.9	0	0.6	0	3.3	2.1	0.7
AUG 15-16	S	0	0	0	0	0	0	0	0	0	3.5	0	0	0	0.6	0	0	3.4	0.5
	M	0	0	0	0	0	0	0	0	4.6	0	0	0	0	0.8	0	0	4.1	0.6
	B	0	0	0	0	0	4.5	0.8	0	0	0	4.6	9.6	4.4	3.1	0	0	4.2	1.8
	MEAN	0	0	0	0	0	1.5	0.3	0	1.5	1.2	1.5	3.2	1.5	1.5	0	0	3.9	1.0
AUG 25-26	S	7.1	0	0	0	0	0	1.2	0	4.2	0	7.8	0	0	2.0	0	0	3.6	1.5
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.9	0	0.3
	B	0	5.2	0	0	0	0	0.9	4.0	26.7	14.2	0	0	0	7.5	13.6	4.2	0	4.5
	MEAN	2.4	1.7	0	0	0	0	0.7	1.3	10.3	4.7	2.6	0	0	3.2	4.5	3.1	1.2	2.1
AUG 29-30	S	0	0	4.0	0	0	0	0.7	0	0	0	0	0	4.3	0.7	0	0	0	0.6
	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13.4	0	4.7	1.2
	B	0	0	4.5	0	0	0	0.8	10.5	5.2	4.6	0	24.5	5.5	8.4	200.9	5.0	0	17.4
	MEAN	0	0	2.8	0	0	0	0.5	3.5	1.7	1.5	0	8.2	3.3	3.0	71.4	1.7	1.6	6.4
SEP 6-7	S	3.6	0	0	0	0	0	0.6	0	0	0	3.6	0	0	0.6	No Catch			0.5
	M	0	0	0	4.1	0	0	0.7	0	0	3.8	0	0	0	0.6				0.5
	B	0	0	0	0	0	0	0	0	3.9	4.4	0	5.8	0	2.4				0.9
	MEAN	1.2	0	0	1.4	0	0	0.4	0	1.3	2.7	1.2	1.9	0	1.2				0.6
SEP 12	S	4.5	4.7	0	0	0	0	1.5	0	0	0	0	0	0	0	3.9	0	0	0.9
	M	0	0	0	0	0	0	0	4.7	4.8	0	0	0	0	1.6	0	0	0	0.6
	B	0	5.0	0	0	0	0	0.8	0	0	4.6	0	0	4.1	1.5	8.2	4.0	4.0	2.0
	MEAN	1.5	3.2	0	0	0	0	0.8	1.6	1.6	1.5	0	0	1.4	1.0	4.0	1.3	1.3	1.2

[1] Number per 1000 m^3

[2] S = surface, M = mid-depth, B = bottom

[3] Stations along contours are established within 3, 1 and 1/2 mile radii east and west of Nine Mile Point Station, Unit 1

NS = No sample, inadequate preservation due to high zooplankton density

APPENDIX F

FISHERIES

- Catch Rate Data
- Length — Frequency
- Coefficient of Maturity and Fecundity
- Age
- Stomach Contents

Table F-1

TIME TABLE FOR GILL NETS SET AT THE 15 DEPTH CONTOUR
DURING THE DAY IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			NMPP			FITZ			NMPE		
	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]
APR I[3]	4-12-77	9.7	1025-2005	4-12-77	9.5	1149-2115	4-12-77	11.3	1234-2350	4-12-77	6.2	1333-1945
	4-14-77	28.1	0900-1305	4-14-77	25.1	1155-1300	4-14-77	22.7	1500-1340	4-14-77	27.8	1015-1400
APR II[4]	4-26-77	11.5	1010-2140	4-26-77	12.0	1055-2255	4-27-77	11.2	0845-1955	4-27-77	9.3	1135-2050
	4-27-77	10.9	0845-1940	4-27-77	10.8	1010-2100	4-28-77	22.9	1045-0940	4-28-77	22.7	1145-1025
MAY I	5-6-77	11.7	0635-1815	5-6-77	10.8	0850-1935	5-6-77	8.3	1005-1820	5-6-77	12.7	0700-1945
	5-7-77	11.1	0715-1830	5-7-77	9.1	0940-1845	5-7-77	11.7	0730-1910	5-7-77	10.0	0940-1940
MAY II	5-17-77	14.4	0620-2045	5-17-77	14.4	0720-2145	5-17-77	15.2	0630-2140	5-17-77	14.9	0705-2200
	5-18-77	14.9	0605-2100	5-18-77	14.2	0705-2115	5-18-77	16.3	0610-2230	5-18-77	14.2	0710-2120
JUN I	6-14-77	15.1	0610-2115	6-14-77	14.8	0725-2215	6-14-77	15.6	0610-2145	6-14-77	14.3	0650-2105
	6-16-77	16.6	0604-2240	6-16-77	15.1	0637-2145	6-16-77	15.8	0605-2150	6-16-77	14.3	0650-2110
JUN II	6-23-77	15.3	0730-2245	6-23-77	14.2	0750-2200	6-23-77	15.3	0740-2220	6-23-77	13.4	0800-2124
	6-24-77	14.8	0615-2100	6-24-77	14.7	0650-2130	6-24-77	15.3	0635-2155	6-24-77	14.0	0715-2116
JUL I	7-7-77	15.5	0715-2245	7-7-77	14.0	0730-2130	7-7-77	13.7	0740-2120	7-7-77	15.3	0715-2235
	7-8-77	23.3	2305-2220	7-8-77	23.0	2209-2100	7-8-77	23.6	2120-2053	7-8-77	23.6	2235-2211
JUL II	7-20-77	16.5	0630-2300	7-20-77	15.8	0645-2230	7-20-77	15.5	0600-2130	7-20-77	15.5	0630-2200
	7-21-77	14.5	0700-2130	7-21-77	17.0	0600-2300	7-21-77	14.9	0630-2125	7-21-77	14.5	0800-2230
AUG I	8-3-77	14.5	0630-2058	8-3-77	14.9	0645-2137	8-3-77	14.4	0710-2135	8-3-77	14.2	0650-2100
	8-4-77	14.0	0643-2045	8-4-77	13.5	0724-2055	8-4-77	14.8	0640-2130	8-4-77	13.3	0705-2055
AUG II	8-23-77	14.3	0700-2115	8-23-77	14.5	0733-2203	8-23-77	13.8	0715-2100	Sample Not Used[5]		
	8-31-77	13.5	0700-2030	8-31-77	14.5	0625-2050	8-31-77	13.3	0705-2010	8-31-77	13.5	0735-2100
SEP I	9-8-77	12.0	0700-1900	9-9-77	14.0	0645-2044	9-8-77	14.3	0710-2130	9-8-77	13.0	0657-2000
	9-9-77	13.1	0735-2041	9-9-77	13.1	0652-2000	9-9-77	12.9	0700-1952	9-9-77	11.4	0810-1932
SEP II	9-21-77	12.2	0805-2015	9-21-77	11.7	0750-2015	9-21-77	13.3	0755-2115	9-21-77	11.2	0815-1930
	9-22-77	13.2	0715-2030	9-22-77	10.5	0900-1930	9-22-77	13.5	0730-2100	9-22-77	11.5	0830-2000
OCT I	10-11-77	9.4	0935-1900	10-11-77	9.6	0955-1930	10-11-77	10.0	1000-2000	10-11-77	9.8	0940-1930
	Missed Sample[6]			Missed Sample[6]			Missed Sample[6]			Missed Sample[6]		
OCT II	10-19-77	9.3	0900-1815	10-19-77	10.0	0845-1845	10-19-77	10.5	0915-1945	Sample Not Used[5]		
	10-20-77	10.0	0830-1830	10-27-77	10.5	1015-2045	10-20-77	12.3	0900-2115	10-28-77	11.0	0830-1930
NOV I	11-2-77	9.0	0915-1815	11-2-77	10.9	0835-1930	11-2-77	10.9	0750-1845	11-2-77	13.0	0715-2015
	11-3-77	9.8	0740-1730	11-3-77	9.7	0805-1745	11-3-77	9.7	0800-1740	11-3-77	10.7	0715-1755
NOV II	11-16-77	9.7	0739-1720	11-16-77	10.1	0752-1800	11-16-77	9.2	0806-1720	11-2-77	9.7	0833-1815
	11-17-77	9.5	0745-1715	11-17-77	7.4	0945-1710	11-17-77	10.5	0730-1800	11-3-77	9.3	0815-1730
DEC I	No Samples Taken in December[6]											
DEC II	No Samples Taken in December[6]											

[1]Pick up date

[2]Set time - pick up time

[3]First sampling period for the month

[4]Second sampling period for the month

*Dur. = Duration in hours

[5]Net hung on bottom or damaged

[6]Sample missed due to weather

Table F-1. (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 15 DEPTH CONTOUR
DURING THE NIGHT IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			NMPP			FITZ			NMPE		
	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]
APR I[3]	4-13-77	12.9	1025-2005	4-13-77	14.7	2115-1155	4-13-77	15.2	2350-1500	4-13-77	14.5	1945-1015
	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
APR II[4]	4-27-77	11.5	2140-0845	4-27-77	11.3	2255-1010	4-26-77	10.5	2220-0845	4-26-77	14.9	2040-1135
	4-28-77	12.8	1940-0825	4-28-77	12.5	2100-0935	4-27-77	14.8	1955-1045	4-28-77	14.9	2050-1145
MAY I	5-6-77	12.3	1820-0635	5-6-77	13.5	1920-0850	5-6-77	14.3	1950-1005	5-6-77	11.3	1945-0700
	5-7-77	13.0	1815-0715	5-7-77	14.1	1935-0940	5-7-77	13.2	1820-0730	5-7-77	13.9	1945-0940
MAY II	5-17-77	9.2	2110-0620	5-17-77	9.8	2135-0720	5-17-77	8.8	2145-0630	5-17-77	9.8	2120-0705
	5-18-77	9.3	2045-0605	5-18-77	9.3	2145-0705	5-18-77	8.5	2140-0610	5-18-77	9.2	2200-0710
JUN I	6-14-77	8.8	2120-0610	6-14-77	9.8	2140-0725	6-14-77	8.4	2145-0610	6-14-77	9.6	2115-0650
	6-16-77	7.6	2228-0604	6-16-77	9.4	2112-0637	6-16-77	7.9	2210-0605	6-16-77	9.5	2120-0650
JUN II	6-24-77	7.2	2303-0615	6-24-77	8.8	2200-0650	6-24-77	7.9	2232-0625	6-24-77	9.3	2140-0655
	6-25-77	9.3	2100-0615	6-25-77	9.1	2145-0650	6-25-77	8.4	2208-0630	6-25-77	9.6	2120-0700
JUL I	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
	7-9-77	8.5	2250-0720	7-9-77	8.4	2145-0610	7-9-77	9.3	2133-0650	7-9-77	7.6	2235-0610
JUL II	7-21-77	7.5	2330-0700	7-21-77	7.3	2330-0700	7-21-77	8.0	2200-0600	7-21-77	9.0	2230-0730
	7-29-77	10.5	2145-0815	7-29-77	10.5	2145-0815	7-29-77	10.5	2045-0715	7-29-77	9.5	2055-0625
AUG I	8-4-77	9.4	2105-0628	8-4-77	9.3	2150-0707	8-4-77	8.8	2140-0630	8-4-77	9.9	2114-0705
	8-5-77	9.9	2050-0643	8-5-77	9.2	2103-0614	8-5-77	9.2	2135-0645	8-5-77	9.9	2105-0700
AUG II	8-31-77	10.3	2030-0645	8-31-77	10.3	2000-0615	8-31-77	10.5	2030-0700	8-31-77	10.3	2100-0715
	9-1-77	11.5	2030-0800	9-1-77	10.8	2050-0730	9-1-77	10.3	2020-0630	9-1-77	9.0	2130-0630
SEP I	9-8-77	12.0	1913-0712	9-9-77	9.6	2100-0635	9-9-77	8.8	2145-0635	9-9-77	11.3	2015-0730
	9-9-77	10.7	2045-0725	9-10-77	10.4	2015-0640	9-10-77	10.3	2001-0620	9-10-77	11.5	1943-0712
SEP II	9-21-77	10.7	2035-0715	9-21-77	13.2	1935-0845	9-21-77	9.7	2130-0715	9-21-77	12.4	1945-0810
	9-22-77	11.4	2035-0800	9-22-77	11.4	1950-0715	9-22-77	10.9	2115-0810	9-22-77	11.3	2030-0750
OCT I	10-11-77	14.5	1915-0945	10-11-77	12.0	2000-0800	10-11-77	13.3	2000-0915	10-11-77	12.0	1930-0730
	10-12-77	21.4	1020-0745	10-12-77	23.5	0900-0830	10-12-77	25.3	0945-1100	10-12-77	25.5	0815-0945
OCT II	10-19-77	13.8	1815-0800	10-19-77	14.5	1900-0930	10-19-77	13.5	2000-0925	10-26-77	12.5	1915-0745
	10-20-77	13.0	1845-0745	10-26-77	13.5	2030-1000	10-26-77	13.0	1945-0845	10-27-77	12.3	2015-0830
NOV I	11-2-77	13.3	1815-0730	11-2-77	12.3	1945-0800	11-2-77	12.3	1930-0745	11-2-77	10.4	2035-0700
	11-3-77	13.5	1730-0700	11-3-77	14.0	1745-0745	11-3-77	13.4	1750-0715	11-3-77	14.0	1800-0800
NOV II	11-16-77	14.3	1730-1745	11-16-77	15.0	1800-0900	11-16-77	13.8	1725-0715	11-16-77	13.8	1815-0800
	11-22-77	11.7	2005-0745	11-22-77	12.0	2030-0830	11-22-77	13.0	2100-1000	11-22-77	12.0	2130-0930
DEC I					No Samples Taken in December[5]							
DEC II					No Samples Taken in December[5]							

[1]Pick up date

[2]Set time - pick up time

[3]First sampling period for the month

[4]Second sampling period for the month

*Dur. = Duration in hours

[5]Sample missed due to weather

Table F-1 (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 20 DEPTH CONTOUR DURING THE DAY IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			FITZ			NMPE		
	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]
APR I[3]	4-14-77	27.4	0916-1250	4-13-77	23.8	1415-1400	4-13-77	21.0	1930-1630
APR II[4]	4-26-77	12.0	1000-2200	4-27-77	11.0	0900-2000	4-27-77	9.9	1115-2110
MAY I	5-6-77	11.5	0705-1835	5-6-77	8.8	0945-1830	5-6-77	12.8	0715-2000
MAY II	5-17-77	11.1	0955-2100	5-17-77	13.3	0850-2210	5-17-77	12.6	0805-2040
JUN I	6-14-77	10.7	0855-1935	6-14-77	10.8	0850-1940	6-14-77	12.0	0815-2015
JUN II	6-23-77	14.3	0850-2310	6-23-77	13.8	0845-2235	6-23-77	13.5	0810-2142
JUL I	7-7-77	14.8	0825-2310	7-7-77	17.9	0825-0220	7-7-77	16.8	0800-0050
JUL II	7-20-77	16.3	0730-2345	7-21-77	17.5	0800-0130	7-20-77	16.3	0730-2345
AUG I	8-3-77	13.5	0720-2052	8-3-77	12.5	0720-1948	8-3-77	12.6	0745-2020
AUG II	8-23-77	12.8	0810-2055	8-23-77	13.0	0745-2045	8-23-77	11.0	0845-1945
SEP I	9-8-77	13.6	0735-2110	9-9-77	11.5	0733-1900	9-8-77	12.6	0740-2015
SEP II	9-21-77	12.5	0859-2130	9-21-77	13.0	0915-2215	9-21-77	12.4	0820-2045
OCT I	10-11-77	8.6	1025-1900	10-11-77	10.2	1005-2015	10-11-77	7.9	1050-1845
OCT II	10-19-77	11.8	0920-2100	10-19-77	11.3	0935-2045	10-19-77	9.0	1010-1915
NOV I	11-2-77	9.4	0920-1845	11-2-77	12.4	0805-2030	11-2-77	14.3	0725-2145
NOV II	11-16-77	7.5	1003-1730	11-16-77	11.1	0937-2045	11-16-77	10.3	0859-1915
DEC I			No Samples Taken in December[5]						
DEC II			No Samples Taken in December[5]						

[1]Pick up date

[2]Set time in pick up time

[3]First sampling period for the month

[4]Second sampling period for the month

[5]Samples missed due to weather

*Dur. = Duration in hours

Table F-1 (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 20 DEPTH CONTOUR
DURING THE NIGHT IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			FITZ			NMPE		
	DATE[1]	DUR*	TIME[2]	DATE[1]	DUR*	TIME[2]	DATE[1]	DUR*	TIME[2]
APR I[3]	4-13-77	12.8	2025-0916	4-13-77	18.9	1920-1415	4-13-77	18.3	1630-1045
APR II[4]	4-27-77	11.0	2200-0900	4-26-77	10.5	2230-0900	4-26-77	14.3	2100-1115
MAY I	5-6-77	12.5	1835-0705	5-6-77	13.8	1955-0945	5-6-77	11.3	2000-0715
MAY II	5-17-77	13.2	2045-0955	5-17-77	11.0	2150-0850	5-17-77	11.6	2030-0805
JUN I	6-14-77	12.3	2035-0855	6-14-77	12.3	2035-0850	6-14-77	11.7	2035-0815
JUN II	6-24-77	8.8	2330-0820	6-28-77	8.2	2125-0535	6-24-77	10.1	2153-0800
JUL I	7-9-77	24.8	2325-0010	7-9-77	23.1	0240-0145	7-9-77	23.2	0050-0002
JUL II	7-21-77	7.3	0045-0800	7-21-77	7.3	0200-0915	7-21-77	9.5	0030-1000
AUG I	8-3-77	9.3	2056-0614	8-4-77	10.0	1956-0600	8-4-77	12.0	2027-0825
AUG II	8-31-77	14.3	1915-0930	8-31-77	12.3	2030-0845	8-31-77	12.0	2000-0800
SEP I	Sample not used[5]			9-9-77	14.8	1900-0947	9-9-77	12.8	2030-0920
SEP II	9-22-77	9.7	2150-0730	9-22-77	11.8	2215-1005	9-22-77	13.0	2100-1000
OCT I	10-12-77	16.0	1900-1100	10-12-77	15.8	2030-1215	10-12-77	17.5	1900-1230
OCT II	10-20-77	13.8	2115-1100	10-20-77	12.5	2100-0935	10-20-77	16.5	1915-1150
NOV I	11-2-77	14.5	1900-0930	11-2-77	12.3	2045-0900	11-2-77	11.3	2200-0915
NOV II	11-16-77	13.8	1740-0730	11-16-77	13.8	2100-1045	11-16-77	14.5	1930-1000
DEC I	No Samples Taken in December[6]								
DEC II	No Samples Taken in December[6]								

[1]Pick up date

[2]Set time - pick up time

[3]First sampling period for the month

[4]Second sampling period for the month

*Dur. = Duration in hours

[5]Net hung on bottom or damaged

[6]Samples missed due to weather

Table F-[illegible] (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 30 DEPTH CONTOUR DURING THE DAY IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			NMPP			FITZ			NMPE		
	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]
APR I[3]	4-12-77	9.5	1055-2025	4-12-77	9.3	1212-2155	4-13-77	11.3	1302-0025	4-12-77	6.5	1352-2020
	4-14-77	26.3	0945-1210	4-14-77	26.8	1045-1330	4-14-77	25.1	1315-1420	4-14-77	30.0	1100-1700
APR II[4]	4-26-77	12.7	0930-2210	4-26-77	11.1	1105-2210	4-27-77	11.1	0910-2015	4-27-77	10.4	1050-2125
	4-27-77	10.9	0915-2010	4-27-77	10.7	1025-2105	4-28-77	23.6	1025-1005	4-28-77	24.8	1200-1245
MAY I	5-6-77	11.3	0725-1840	5-6-77	10.8	0905-1950	5-6-77	9.9	0925-1920	5-6-77	12.6	0735-2010
	5-7-77	10.8	0750-1835	5-7-77	9.7	0920-1900	5-7-77	10.8	1835-1925	5-7-77	10.0	1000-2000
MAY II	5-17-77	10.1	0940-1945	5-17-77	11.7	0840-2020	5-17-77	10.8	0900-1950	5-17-77	11.9	0830-2025
	5-18-77	12.0	0815-2015	5-18-77	12.0	0745-1945	5-18-77	10.8	0915-2005	5-18-77	10.8	0900-1950
JUN I	6-14-77	11.3	0835-1950	6-14-77	12.8	0745-2035	6-14-77	10.8	0905-1950	6-14-77	12.6	0750-2025
	6-16-77	12.3	0801-2021	6-16-77	13.7	0733-2115	6-16-77	11.8	0830-2015	6-16-77	12.3	0820-2040
JUN II	6-23-77	14.2	0900-2311	6-23-77	14.0	0800-2201	6-23-77	13.9	0855-2248	6-23-77	12.6	0820-2056
	6-24-77	13.9	0815-2208	6-24-77	14.3	0735-2150	6-24-77	13.0	0845-2142	6-24-77	13.2	0755-2108
JUL I	7-7-77	15.0	0830-2330	7-7-77	16.5	0805-0035	7-7-77	17.1	0835-0140	7-7-77	17.8	0805-0150
	7-8-77	23.6	2355-2330	7-8-77	24.1	0045-0050	7-8-77	23.2	0210-0119	7-8-77	21.6	0150-2326
JUL II	7-21-77	17.0	0745-0045	7-20-77	19.0	0700-0200	7-20-77	12.8	0800-2045	7-21-77	17.0	0731-0031
	7-30-77	12.8	0943-2228	7-30-77	12.8	0917-2202	7-30-77	12.3	0922-2137	7-21-77	12.9	1115-0010
AUG I	8-3-77	13.4	0725-2046	8-3-77	12.9	0700-1955	8-3-77	12.5	0730-1958	8-3-77	12.6	0755-2030
	8-4-77	11.9	0828-2022	8-4-77	12.0	0752-1952	8-4-77	10.5	0920-1955	8-4-77	12.0	0820-2020
AUG II	8-23-77	12.0	0835-2035	8-23-77	12.0	0805-2005	8-23-77	12.5	0800-2030	8-23-77	11.3	0830-1945
	8-31-77	10.0	0940-1940	8-31-77	10.8	0910-2000	8-31-77	11.0	0840-1950	8-31-77	11.3	0830-1940
SEP I	9-8-77	12.0	0716-1915	9-8-77	12.5	0745-2016	9-8-77	11.5	0727-1900	9-8-77	13.0	0747-2045
	9-9-77	12.0	1930-1930	9-9-77	10.4	0935-2000	9-9-77	9.6	1035-2009	9-9-77	10.1	0915-1920
SEP II	9-21-77	12.9	0820-2115	9-21-77	13.3	0910-2230	9-21-77	12.6	0925-2200	9-21-77	11.7	0830-2015
	9-22-77	12.5	0830-2100	9-22-77	12.0	1000-2200	9-22-77	11.6	1025-2200	9-22-77	9.8	0955-1945
OCT I	10-11-77	8.3	1030-1845	10-11-77	10.7	1005-2045	10-11-77	10.3	1010-2030	10-11-77	7.8	1055-1840
	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
OCT II	10-19-77	11.5	0915-2045	10-19-77	9.8	0945-1930	10-19-77	10.8	0940-2030	10-19-77	9.0	1020-1915
	10-27-77	8.3	1115-1930	10-27-77	9.8	1030-2015	10-27-77	11.5	0930-2100	10-27-77	11.8	0815-2000
NOV I	11-2-77	9.8	0925-1915	11-2-77	10.9	0850-1945	11-2-77	12.7	0805-2045	11-2-77	14.4	0720-2145
	11-3-77	9.1	0925-1830	11-3-77	9.4	0835-1800	11-3-77	9.8	0900-1850	11-3-77	9.1	0930-1835
NOV II	11-16-77	9.0	1012-1912	11-16-77	8.6	0943-1820	11-16-77	10.9	0907-2000	11-16-77	10.8	0854-1945
	11-17-77	6.5	1145-1815	11-17-77	6.0	1100-1700	11-17-77	7.8	1045-1830	11-17-77	7.8	0945-1730
DEC I	No Samples Taken in December[5]											
DEC II	No Samples Taken in December[5]											

[1]Pick up date

[2]Set time - pick up time

[3]First sampling period for the month

[4]Second sampling period for the month

* Dur. = Duration in hours

[5]Sample missed due to weather

Table F-1 (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 30 DEPTH CONTOUR
DURING THE NIGHT IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			NMPP			FITZ			NMPE		
	DATE[1]	DUR.	TIME[2]	DATE[1]	DUR.	TIME[2]	DATE[1]	DUR.	TIME[2]	DATE[1]	DUR.	TIME[2]
APR I[3]	4-13-77	13.3	2055-0945	4-13-77	13.3	2125-1045	4-13-77	12.8	0025-1315	4-13-77	14.7	2020-1100
	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
APR II[4]	4-26-77	11.1	2210-0915	4-26-77	12.3	2210-1025	4-26-77	10.5	2240-0910	4-26-77	13.7	2115-1050
	4-27-77	12.5	2010-0825	4-27-77	12.6	2105-0941	4-27-77	14.2	2015-1025	4-27-77	14.6	2125-1200
MAY I	5-6-77	12.7	1845-0725	5-6-77	14.5	1930-0905	5-6-77	13.5	2000-0925	5-6-77	11.5	2010-0735
	5-7-77	13.2	1840-0750	5-7-77	13.5	1950-0920	5-7-77	13.3	1920-0835	5-7-77	13.8	2010-1000
MAY II	5-13-77	13.1	2035-0940	5-17-77	10.6	2205-0840	5-17-77	11.3	2140-0900	5-17-77	11.8	2045-0830
	5-18-77	12.5	1945-0815	5-18-77	11.4	2020-0745	5-18-77	13.4	1950-0915	5-18-77	12.6	2025-0900
JUN I	6-14-77	11.7	2055-0835	6-14-77	10.5	2115-0745	6-14-77	12.3	2045-0905	6-14-77	11.2	2040-0750
	6-16-77	12.0	1959-0801	6-16-77	10.8	2045-0733	6-16-77	12.8	1945-0830	6-16-77	12.1	2015-0820
JUN II	6-24-77	8.8	2318-0805	6-23-77	9.4	2201-0725	6-25-77	10.4	2152-0815	6-24-77	10.6	2107-0745
	6-25-77	10.0	2215-0815	6-24-77	10.0	2157-0755	6-28-77	8.4	2135-0600	6-25-77	10.5	2114-0745
JUL I	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
	7-9-77	9.1	2355-0900	7-9-77	6.9	0110-0805	7-9-77	7.0	0145-0845	7-9-77	9.1	2357-0905
JUL II	7-21-77	7.3	0100-0815	7-21-77	6.3	0300-0915	7-21-77	13.0	2100-1000	7-21-77	9.8	0100-1045
	7-29-77	10.5	2135-0805	7-29-77	6.8	2210-0500	7-29-77	7.9	2215-0610	7-29-77	7.8	2250-0635
AUG I	8-4-77	11.4	2051-0816	8-4-77	11.4	2015-0739	8-4-77	13.0	2003-0905	8-4-77	11.5	2034-0805
	8-5-77	10.6	2038-0714	8-5-77	11.9	1957-0748	8-5-77	10.0	2000-0600	8-5-77	11.7	2025-0805
AUG II	8-31-77	14.3	1915-0930	8-31-77	13.0	2000-0900	8-31-77	11.8	2045-0830	8-31-77	12.0	2000-0800
	9-1-77	11.3	1940-0700	9-1-77	12.5	2000-0830	9-1-77	12.3	2005-0815	9-1-77	12.0	1945-0745
SEP I	9-9-77	13.0	1927-0830	9-9-77	12.5	2040-0910	9-9-77	15.0	1915-1015	9-9-77	12.1	2045-0852
	9-10-77	12.8	1930-0820	9-10-77	12.7	2009-0850	9-10-77	12.7	2010-0850	9-10-77	12.9	1930-0823
SEP II	9-22-77	10.7	2130-0815	9-22-77	11.2	2235-0945	9-22-77	12.2	2200-1010	9-22-77	13.0	2030-0935
	9-23-77	11.3	2125-0845	9-23-77	10.7	2215-0900	9-23-77	10.6	2215-0850	9-23-77	11.0	2015-0715
OCT I	10-11-77	16.5	1845-1115	10-11-77	15.8	2045-1230	10-11-77	13.8	2045-1030	10-11-77	18.0	1845-1245
	10-12-77	19.8	1215-0800	10-12-77	19.7	1305-0845	10-12-77	24.3	1100-1115	10-12-77	20.8	1315-1000
OCT II	10-19-77	14.8	2100-1145	10-19-77	15.0	1945-1045	10-19-77	14.3	2045-1055	10-19-77	16.8	1930-1215
	10-26-77	14.3	2045-1100	10-26-77	13.8	2030-1015	10-26-77	13.5	1945-0915	10-27-77	12.8	1915-0800
NOV I	11-2-77	13.8	1930-0915	11-2-77	12.5	2000-0830	11-2-77	11.8	2100-0845	11-2-77	11.8	2145-0930
	11-3-77	14.0	1845-0845	11-3-77	13.8	1815-0800	11-3-77	13.8	1900-0845	11-3-77	14.5	1845-0915
NOV II	11-16-77	16.2	1920-1130	11-16-77	16.0	1830-1030	11-16-77	14.0	2015-1015	11-16-77	13.5	2000-0930
	11-22-77	11.4	2020-0745	11-22-77	12.0	2030-0830	11-22-77	13.0	2100-1000	11-22-77	12.0	2135-0930
DEC I	No Samples Taken in December[5]											
DEC II	No Samples Taken in December[5]											

[1]Pick up date

[2]Set time - pick up time

[3]First sampling period for the month

[4]Second sampling period for the month

*Dur. = Duration in hours

[5]Sample missed due to weather

Table F-[illegible] (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 40 DEPTH CONTOUR DURING THE DAY IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			NMPP			FITZ			NMPE		
	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]	DATE[1]	DUR.*	TIME[2]
APR I[3]	4-12-77	9.2	1130-2040	4-12-77	9.5	1209-2135	4-12-77	8.8	1310-2200	4-12-77	6.7	1400-2040
	4-14-77	26.7	1010-1235	4-13-77	26.5	1105-1320	4-14-77	26.3	1245-1502	4-14-77	30.5	1115-1745
APR II[4]	4-26-77	12.0	1025-2225	4-26-77	11.1	1120-2225	4-27-77	11.0	0930-2025	4-27-77	10.8	1052-2140
	4-27-77	10.8	0940-2020	4-27-77	11.0	1040-2140	4-28-77	23.8	1045-1030	4-28-77	25.1	1210-1315
MAY I	5-6-77	11.2	0740-1850	5-6-77	10.5	0930-2000	5-6-77	9.6	0955-1930	5-6-77	12.3	0755-2015
	5-7-77	10.5	0805-1835	5-7-77	9.9	0905-1900	5-7-77	11.3	0800-1920	5-7-77	9.7	1010-1950
MAY II	5-17-77	14.8	0650-2140	5-17-77	14.7	0805-2245	5-17-77	16.0	0650-2250	5-17-77	14.0	0720-2120
	5-18-77	14.8	0630-2115	5-18-77	16.0	0650-2250	5-18-77	14.5	0630-2100	5-18-77	12.8	0810-2100
JUN I	6-14-77	14.6	0625-2100	6-14-77	14.4	0710-2135	6-14-77	14.8	0635-2125	5-14-77	13.7	0715-2055
	6-16-77	15.9	0622-2217	6-16-77	15.3	0657-2215	6-16-77	15.0	0635-2135	5-16-77	13.3	0740-2100
JUN II	6-23-77	15.8	0740-2333	6-23-77	14.1	0810-2213	6-23-77	13.8	0820-2210	6-23-77	13.4	0750-2115
	6-24-77	14.6	0635-2110	6-24-77	14.0	0720-2120	6-24-77	14.9	0645-2137	6-24-77	13.6	0725-2101
JUL I	7-7-77	15.2	0720-2230	7-7-77	14.6	0735-2210	7-7-77	13.8	0750-2140	7-7-77	16.2	0730-2340
	7-8-77	24.3	2235-2255	7-8-77	23.6	2215-2150	7-8-77	23.9	2140-2136	7-8-77	23.0	2340-2240
JUL II	7-20-77	16.5	0630-2300	7-20-77	15.5	0600-2130	7-20-77	14.3	0700-2115	7-20-77	16.5	0600-2230
	7-21-77	15.0	0730-2230	Sample not used[5]			7-21-77	14.8	0710-2200	7-21-77	14.8	0850-2335
AUG I	8-3-77	14.5	0635-2107	8-3-77	15.0	0650-2152	8-3-77	14.3	0700-2120	8-3-77	14.2	0640-2052
	8-4-77	13.5	0702-2030	8-4-77	13.5	0736-2107	8-4-77	14.3	0655-2115	8-4-77	12.9	0750-2045
AUG II	8-23-77	14.3	0725-2140	8-23-77	14.8	0735-2220	8-23-77	14.0	0715-2115	8-23-77	15.3	0700-2215
	8-31-77	13.5	0645-2020	8-31-77	13.8	0635-2010	8-31-77	12.8	0740-2020	8-31-77	14.0	0750-2140
SEP I	9-8-77	14.3	0709-2124	9-8-77	13.3	0650-2000	9-8-77	14.0	0715-2115	9-8-77	13.0	0650-1945
	9-9-77	12.3	0825-2045	9-9-77	13.1	0707-2015	9-9-77	12.8	0725-2012	9-9-77	11.3	0825-1945
SEP II	Sample not used[5]			9-21-77	12.0	0759-2000	9-21-77	13.7	0745-2130	9-21-77	11.8	0810-2000
	9-22-77	12.5	0800-2030	9-22-77	12.5	0930-2200	9-21-77	13.2	0800-2115	9-22-77	11.4	0905-2030
OCT I	10-11-77	9.5	0945-1915	10-11-77	10.0	1000-2000	10-11-77	10.9	0950-2045	10-11-77	9.5	0930-1900
	Missed Sample[6]			Missed Sample[6]			Missed Sample[6]			Missed Sample[6]		
OCT II	10-19-77	9.5	0905-1830	10-19-77	10.5	0850-1915	10-19-77	10.3	0945-2000	10-19-77	10.0	0850-1845
	10-20-77	9.8	0915-1900	10-27-77	9.5	1045-2015	10-27-77	11.0	0945-2045	10-27-77	11.3	0830-1945
NOV I	11-2-77	9.4	0905-1830	11-2-77	11.3	0845-2000	11-2-77	11.8	0755-1945	11-2-77	13.3	0730-2045
	11-3-77	9.7	0750-1730	11-3-77	9.8	0815-1800	11-3-77	9.3	0800-1720	11-3-77	10.7	0730-1810
NOV II	11-16-77	10.1	0745-1750	11-16-77	10.1	0800-1805	11-16-77	9.3	0815-1730	11-16-77	9.8	0840-1830
	11-17-77	8.5	0900-1730	Sample not used[5]			11-17-77	10.0	0800-1800	11-17-77	8.5	0845-1715
DEC I	No Samples Taken in December[6]											
DEC II	No Samples Taken in December[6]											

[1] Pick up date
[2] Set time - pick up time
[3] First sampling period for the month
[4] Second sampling period for the month
* Dur. = Duration in hours
[5] Net hung on bottom or damaged
[6] Sample missed due to weather

Table F-1 (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 40 DEPTH CONTOUR
DURING THE NIGHT IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			NMPP			FITZ			NMPE		
	DATE[1]	DUR.*	TIME[2]	DATE	DUR.*	TIME	DATE	DUR.*	TIME	DATE	DUR.*	TIME
APR I[3]	4-13-77	13.5	2040-1010	4-13-77	13.5	2135-1105	4-13-77	14.8	2200-1245	4-13-77	14.5	2040-1115
	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
APR II[4]	4-26-77	12.9	2225-0940	4-26-77	12.8	2225-1040	4-26-77	10.5	2300-0930	4-26-77	13.4	2130-1052
	4-27-77	12.5	2020-0850	4-27-77	11.7	2140-1000	4-27-77	14.3	2025-1045	4-27-77	14.5	2140-1210
MAY I	5-6-77	12.7	1900-0740	5-6-77	14.5	0930-1905	5-6-77	15.2	1845-0955	5-6-77	11.6	2020-0755
	5-7-77	13.3	1850-0805	5-7-77	13.1	2000-0905	5-7-77	12.5	1930-0800	5-7-77	13.9	2015-1010
MAY II	5-17-77	9.8	2100-0650	5-17-77	10.8	2120-0805	5-17-77	9.3	2135-0650	5-17-77	10.3	2105-0720
	5-18-77	8.8	2140-0630	5-18-77	8.1	2245-0650	5-18-77	7.9	2250-0645	5-18-77	10.8	2120-0810
JUN I	6-14-77	8.9	2130-0625	6-14-77	9.2	2200-0710	6-14-77	8.8	2145-0635	6-14-77	9.8	2125-0715
	6-16-77	8.4	2200-0622	6-16-77	10.0	2100-0657	6-16-77	8.7	2155-0635	6-16-77	10.7	2100-0740
JUN II	6-24-77	6.8	2342-0630	6-24-77	8.9	2222-0715	6-24-77	8.4	2217-0640	6-24-77	10.0	2122-0720
	6-25-77	9.3	2115-0630	6-24-77	9.9	2125-0720	6-25-77	9.4	2140-0645	6-25-77	10.2	2106-0720
JUL I	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
	7-9-77	8.0	2305-0745	7-9-77	8.8	2210-0700	7-9-77	9.4	2204-0725	7-9-77	7.6	2257-0635
JUL II	7-21-77	8.5	2300-0730	Sample not used[6]			7-21-77	9.3	2130-0645	7-21-77	9.0	2300-0800
	7-29-77	10.4	2132-0755	7-29-77	10.3	2120-0735	7-29-77	10.1	2100-0705	7-29-77	9.8	2100-0645
AUG I	8-4-77	9.4	2125-0646	8-4-77	9.5	2157-0728	8-4-77	9.3	2129-0645	8-4-77	10.7	2056-0740
	8-5-77	10.3	2043-0701	8-5-77	9.3	2113-0630	8-5-77	9.1	2120-0625	8-5-77	10.8	2050-0735
AUG II	8-30-77	10.8	2000-0645	8-31-77	10.3	2000-0615	8-31-77	10.0	2100-0700	8-31-77	10.8	2100-0745
	9-1-77	11.8	2020-0800	9-1-77	11.3	2010-0730	9-1-77	10.0	2030-0630	9-1-77	9.5	2150-0715
SEP I	Sample not used[6]			Sample not used[6]			9-9-77	9.8	2115-0707	9-8-77	12.3	2000-0815
	9-10-77	10.9	2100-0755	9-10-77	10.5	2030-0700	9-10-77	10.5	2017-0647	9-10-77	11.9	1950-0745
SEP II	9-21-77	10.7	2100-0745	9-21-77	13.0	2000-0900	9-21-77	10.2	2130-0745	9-21-77	12.7	2000-0840
	9-22-77	11.3	2055-0815	Sample not used[6]			9-22-77	11.2	2115-0825	9-22-77	11.2	2030-0740
OCT I	10-11-77	15.0	1930-1030	10-11-77	12.8	2015-0900	10-11-77	12.5	2100-0930	10-11-77	13.5	1900-0830
	10-12-77	21.2	1050-0800	10-12-77	23.4	0935-0900	10-12-77	25.3	1015-1130	10-12-77	25.3	0900-1015
OCT II	10-19-77	14.3	1830-0845	10-19-77	14.5	1915-0945	10-19-77	13.5	2015-0950	10-19-77	14.0	1900-0900
	10-20-77	12.5	1930-0800	10-26-77	14.0	2030-1030	10-26-77	14.0	1930-0930	10-26-77	13.3	1900-0815
NOV I	11-2-77	13.0	1845-0745	11-2-77	11.5	2030-0800	11-2-77	11.6	2025-0800	11-2-77	10.3	2100-0715
	11-3-77	13.8	1745-0730	11-3-77	14.0	1800-0800	11-3-77	14.0	1730-0730	11-3-77	14.0	1815-0815
NOV II	11-16-77	14.8	1800-0845	11-16-77	15.5	1315-0945	11-16-77	13.8	1745-0730	11-16-77	13.5	1845-0815
	11-22-77	11.8	2010-0800	11-22-77	12.2	2035-0845	11-22-77	13.0	2115-1015	11-22-77	12.1	2140-0945
DEC I	NO SAMPLES TAKEN IN DECEMBER[5]											
DEC II	NO SAMPLES TAKEN IN DECEMBER[5]											

[1]Pick up date
[2]Set time - pick up time
[3]First sampling period for the month
[4]Second sampling period for the month
*Dur. = Duration in hours
[5]Sample missed due to weather
[6]Net hung on bottom or damaged

Table F-[illegible] (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 60 DEPTH CONTOUR DURING THE DAY IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			NMPP			FITZ			NMPE		
	DATE[1]	DUR.*	TIME[2]	DATE	DUR.*	TIME	DATE	DUR.*	TIME	DATE	DUR.*	TIME
APR I[3]	4-12-77	9.4	1132-2055	4-12-77	9.4	1227-2150	4-12-77	9.3	1320-2240	4-12-77	6.8	1410-2100
	4-13-77	24.8	1025-1115	4-13-77	27.5	1135-1500	4-13-77	27.5	1540-1210	4-13-77	31.0	1135-1820
APR II[4]	4-26-77	12.1	1035-2240	4-26-77	11.3	1135-2250	4-27-77	10.5	1005-2035	4-27-77	11.5	1028-2155
	4-27-77	10.8	0955-2040	4-27-77	10.5	1055-2125	4-28-77	23.9	1115-1110	4-28-77	25.0	1230-1330
MAY I	5-6-77	10.6	0820-1855	5-6-77	9.2	1005-1915	5-6-77	10.9	0840-1935	5-6-77	11.7	0830-2010
	5-7-77	10.5	0820-1850	5-7-77	10.5	0840-1910	5-7-77	10.6	0900-1935	5-7-77	9.7	1025-2005
MAY II	5-17-77	11.8	0940-1930	5-17-77	10.8	0910-2000	5-17-77	10.3	0915-1930	5-17-77	12.4	0745-2010
	5-18-77	11.8	0805-1955	5-18-77	11.6	0755-1930	5-18-77	11.3	0900-2015	5-18-77	10.8	0845-1930
JUNE I	6-14-77	11.6	0825-2000	6-14-77	12.3	0825-2025	6-14-77	10.6	0925-2000	6-14-77	13.0	0735-2035
	6-16-77	12.4	0745-2011	6-16-77	13.5	0718-2050	6-16-77	11.5	0855-2025	6-16-77	12.8	0805-2050
JUNE II	6-23-77	14.3	0905-2325	6-23-77	13.8	0835-2225	6-23-77	12.8	0910-2200	6-23-77	12.3	0830-2048
	6-24-77	14.4	0800-2223	6-24-77	14.3	0745-2200	6-24-77	12.4	0900-2125	6-24-77	12.9	0740-2036
JULY I	7-7-77	15.5	0835-0005	7-7-77	16.6	0815-0050	7-7-77	17.9	0845-0240	7-7-77	16.0	0815-0015
	7-8-77	22.8	0025-2310	7-8-77	24.3	0100-0115	7-8-77	22.1	0240-0047	7-8-77	23.0	0015-2302
JULY II	7-21-77	17.0	0800-0100	7-20-77	13.3	0730-2045	7-20-77	12.5	0800-2030	Missed Sample[6]		
	Sample not used[5]			7-30-77	13.0	0920-2200	7-30-77	12.8	0849-2137	Missed Sample[6]		
AUG I	8-3-77	13.1	0730-2035	8-3-77	13.1	0710-2017	8-3-77	12.5	0735-2005	8-3-77	12.7	0800-2040
	8-4-77	11.7	0833-2012	8-4-77	11.9	0809-2000	8-4-77	10.5	0935-2005	8-4-77	12.5	0800-2030
AUG II	8-23-77	12.0	- -2025	8-31-77	12.3	0725-1940	8-23-77	11.8	0815-2000	8-23-77	10.8	1030-1930
	8-31-77	11.8	0930-1930	8-23-77	11.0	0855-2000	8-31-77	12.3	0825-2040	8-31-77	11.5	0800-1925
SEP I	9-8-77	12.0	0727-1930	9-8-77	11.8	0755-1946	9-8-77	12.0	0720-1915	9-8-77	11.7	0752-1930
	9-9-77	10.2	0905-1915	9-9-77	9.4	1005-1930	9-9-77	9.6	1045-2019	9-9-77	10.4	0845-1910
SEP II	9-21-77	14.7	0830-2315	9-21-77	12.7	0920-2200	9-21-77	12.2	0935-2145	9-21-77	13.8	0855-2245
	9-22-77	11.5	0930-2100	9-22-77	11.7	0945-2130	9-22-77	10.8	1040-2130	9-22-77	10.1	0925-1930
OCT I	10-11-77	7.9	1035-1830	Sample not used[5]			10-11-77	10.6	1025-2100	10-11-77	7.2	1105-1815
	Missed Sample[6]			Missed Sample[6]			Missed Sample[6]			Missed Sample[6]		
OCT II	10-19-77	11.0	0930-2030	10-19-77	10.0	1005-2000	10-19-77	10.3	0955-2015	10-19-77	8.0	1035-1830
	10-27-77	9.5	1130-2100	10-27-77	9.5	1100-2030	10-27-77	10.5	1000-2030	10-27-77	10.8	0845-1930
NOV I	11-2-77	9.8	0930-1915	11-2-77	11.6	0855-2030	11-2-77	12.8	0810-2100	11-2-77	13.3	0740-2100
	11-3-77	9.6	0910-1845	11-3-77	9.8	0830-1815	11-3-77	10.6	0830-1905	11-3-77	8.3	1000-1820
NOV II	11-16-77	8.5	1020-1850	11-16-77	8.7	0956-1840	11-16-77	10.9	0915-2010	11-16-77	10.0	0847-1845
	11-17-77	6.8	1115-1800	11-17-77	6.3	1030-1645	11-17-77	8.0	1015-1815	11-17-77	7.8	0915-1700
DEC I	No Samples Taken in December[6]											
DEC II	No Samples Taken in December[6]											

[1] Pick up date
[2] Set time - pick up time
[3] First sampling period for the month
[4] Second sampling period for the month
*Dur. = Duration in hours
[5] Net hung on bottom or damaged
[6] Sample missed due to weather

Table F-1 (CONTD)

TIME TABLE FOR GILL NETS SET AT THE 60 DEPTH CONTOUR
DURING THE NIGHT IN THE VICINITY OF NINE MILE POINT, 1977

SAMPLING PERIOD	NMPW			NMPP			FITZ			NMPE		
	DATE[1]	DUR.*	TIME[2]	DATE	DUR.*	TIME	DATE	DUR.*	TIME	DATE	DUR.*	TIME
APR I[3]	4-13-77	13.5	2055-1025	4-13-77	18.3	2150-1135	4-13-77	13.5	2240-1210	4-13-77	14.6	2100-1135
	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
APR II[4]	4-26-77	11.3	2240-0955	4-26-77	12.1	2250-1055	4-26-77	10.8	2320-1005	4-26-77	12.5	2150-1028
	4-27-77	12.5	2040-0915	4-28-77	35.8	2125-0910	4-27-77	14.6	2035-1115	4-27-77	14.5	2155-1230
MAY I	5-6-77	13.2	1910-0820	5-6-77	14.7	1925-1005	5-6-77	13.3	1920-0840	5-6-77	12.0	2030-0830
	5-7-77	13.4	1855-0820	5-7-77	13.4	1915-0840	5-7-77	13.4	1935-0900	5-7-77	14.3	2010-1025
MAY II	5-17-77	13.2	2030-0940	5-17-77	12.4	2045-0910	5-17-77	11.8	2125-0915	5-17-77	10.8	2100-0745
	5-18-77	12.6	1930-0805	5-18-77	11.9	2000-0755	5-18-77	13.5	1930-0900	5-18-77	12.6	2010-0845
JUN I	6-14-77	11.3	2110-0825	6-14-77	10.7	2125-0805	6-14-77	12.4	2100-0925	6-14-77	10.6	2100-0735
	6-16-77	12.1	1941-0745	6-16-77	10.9	2023-0718	6-16-77	13.0	1955-0855	6-16-77	11.6	2030-0805
JUN II	6-24-77	8.3	2335-0755	6-24-77	9.1	2235-0740	6-24-77	10.0	2208-0850	6-23-77	10.6	2054-0730
	6-25-77	10.0	2228-0825	6-25-77.	9.6	2202-0735	6-25-77	10.6	2130-0805	6-24-77	10.7	2046-0730
JUL I	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
	7-9-77	9.3	2320-0840	7-9-77	6.8	0130-0820	7-9-77	6.5	0115-0745	7-9-77	10.3	2315-0930
JUL II	7-21-77	7.0	0130-0830	7-21-77	12.0	2100-0900	7-30-77	23.8	0855-0845	7-29-77	7.8	2310-0700
	Sample not used[6]			7-29-77	6.8	2245-0535	7-29-77	7.8	2230-0620	7-30-77	23.5	0815-0800
AUG I	8-4-77	11.7	2045-0829	8-4-77	11.5	2030-0757	8-4-77	13.3	2012-0930	8-4-77	11.2	2045-0755
	8-5-77	11.2	2012-0723	8-5-77	12.5	2010-0840	8-5-77	9.6	2012-0550	8-5-77	11.2	2037-0750
AUG II	8-31-77	14.0	1930-0930	8-31-77	12.8	2000-0845	8-31-77	11.3	2100-0815	8-31-77	11.8	2000-0745
	9-1-77	11.0	1930-0630	9-1-77	11.0	2000-0700	9-1-77	11.3	2040-0800	9-1-77	12.0	1935-0730
SEP I	9-9-77	13.3	1940-0900	9-9-77	13.7	1958-0940	9-9-77	15.4	1915-1040	9-9-77	12.8	1945-0832
	Sample not used[6]			9-10-77	13.3	1945-0805	9-10-77	12.8	2024-0910	9-10-77	12.8	1915-0803
SEP II	9-22-77	10.0	2330-0930	9-22-77	11.3	2210-0930	9-22-77	12.7	2145-1030	9-22-77	10.4	2245-0910
	9-23-77	11.4	2105-0330	9-23-77	11.1	2200-0905	9-23-77	10.7	2200-0840	Sample not used[6]		
OCT I	10-11-77	37.8	1830-0815	10-11-77	36.5	2030-0900	10-11-77	38.0	2130-1130	10-11-77	40.3	1815-1030
	Missed Sample[5]			Missed Sample[5]			Missed Sample[5]			Missed Sample[5]		
OCT II	10-19-77	15.0	2045-1145	10-19-77	14.3	2015-1030	10-19-77	14.0	2030-1030	10-19-77	18.3	1830-1250
	10-26-77	14.5	2045-1115	10-26-77	14.5	2015-1045	10-26-77	14.3	1930-0945	10-26-77	13.5	1900-0830
NOV I	11-2-77	13.5	1930-0900	11-2-77	11.5	2045-0815	11-2-77	11.5	2115-0845	11-2-77	12.4	2120-0945
	11-3-77	14.0	1900-0900	11-3-77	13.8	1830-0815	11-3-77	13.4	1905-0830	11-3-77	14.5	1830-0900
NOV II	11-16-77	15.9	1905-1100	11-16-77	15.4	1850-1015	11-16-77	13.5	2030-1000	11-16-77	13.8	1900-0845
	11-22-77	11.6	2025-0300	11-22-77	12.1	2040-0845	11-22-77	13.0	2115-1015	11-22-77	12.0	2145-0945
DEC I	NO SAMPLES TAKEN IN DECEMBER[5]											
DEC II	NO SAMPLES TAKEN IN DECEMBER[5]											

[1]Pick up date

[2]Set time - pick up time

[3]First sampling period for the month

[4]Second sampling period for the month

*Dur. = Duration in hours

[5]Sample missed due to weather

[6]Net hung on bottom or damaged

Table F-2

SPATIAL DISTRIBUTION OF ALEWIFE COLLECTED BY GILL NET[1], NINE MILE POINT VICINITY, 1977

Month	15-ft Contour				30-ft Contour				40-ft Contour				60-ft Contour			
	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE
April	2.68	2.20	1.37	5.94	4.13	7.06	3.46	10.37	6.17	7.46	16.29	14.97	2.82	1.03	6.77	10.38
May	2.62	19.42	24.94	23.75	7.08	8.99	2.99	31.37	14.19	12.40	11.66	12.93	3.59	6.83	0.86	5.93
June	6.02	8.18	24.64	11.18	1.79	1.06	1.59	1.31	1.23	0.96	2.13	0.88	0.74	1.35	0.42	0.26
July	16.19	32.40	23.34	40.92	4.65	38.59	37.07	32.88	6.30	24.19	30.81	30.04	0.98	0.35	2.62	33.07
August	3.59	3.43	5.38	15.24	2.38	1.45	1.07	2.71	0	0	4.29	0.98	0	0	0.11	0.80
September	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
October	1.98	1.17	7.43	2.52	0.74	0.22	0.85	0.23	0	0.12	0.83	2.11	0	0.07	0	0
November	0.53	0.10	0.57	1.85	1.65	0.99	0.60	0.87	0.38	0	0.12	2.58	0.27	0.54	2.91	0
Annual Mean	6.58	8.36	10.96	12.67	2.80	7.29	5.96	9.97	3.53	5.64	8.27	8.06	1.05	1.27	1.71	6.31

(1) Unweighted Mean Monthly Catch per 12-hr Set.

Table F-3

SPATIAL DISTRIBUTION OF RAINBOW SMELT COLLECTED BY GILL NET[1], NINE MILE POINT VICINITY, 1977

Month	15-ft Contour				30-ft Contour				40-ft Contour				60-ft Contour			
	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPE	FITZ	NMPE
April	16.37	15.61	1.80	8.81	12.48	2.00	17.31	6.23	3.93	3.15	15.29	11.26	2.81	1.53	7.50	0.88
May	1.55	2.52	1.89	0.71	0.23	0.94	7.54	1.32	1.61	2.44	6.00	2.47	1.41	2.24	1.43	1.47
June	0.84	0.41	0.28	0.31	3.91	2.94	4.52	5.34	5.55	4.46	5.24	3.77	7.48	7.01	12.12	4.07
July	0.07	0	0	0	0.22	0.75	0.07	1.11	1.02	2.00	0.69	3.02	8.32	3.08	8.13	1.78
August	0	0	0	0	0.10	0	0	0	0	0	0	0	0	0.24	0	0.27
September	0	0	0	0	0.12	0.40	0	0	0.36	0.31	0	0	0.30	0.27	0.12	0
October	1.60	2.12	1.81	3.27	0.76	0.96	3.05	8.91	0.58	1.37	5.63	9.54	1.46	2.13	6.17	5.14
November	1.17	2.10	2.72	1.62	2.57	1.87	3.32	2.76	1.34	0.99	3.38	8.93	0.93	3.90	2.94	1.46
Annual Mean	2.70	2.84	1.06	1.84	2.55	1.23	4.48	3.21	1.80	1.84	4.53	4.87	2.84	2.55	4.80	1.88

(1) Unweighted Mean Monthly Catch per 12-hr Set.

Table F-4

SPATIAL DISTRIBUTION OF SMALLMOUTH BASS COLLECTED BY GILL NET(1), NINE MILE POINT VICINITY, 1977

Month	15-ft Contour				30-ft Contour				40-ft Contour				60-ft Contour			
	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE
April	0	0	0	0	0	0.14	0.15	0	0	0	0	0	0	0	0	0
May	0.12	0	0.44	0.11	0	0	0	0	0	0	0	0.15	0	0	0	0
June	0	0.43	0.47	0.32	0.12	0.14	0	0	0	0	0	0	0	0	0	0
July	0.46	0.38	0.12	0.31	0.19	0.36	0.27	0.08	0.32	0	0.17	0	0	0	0	0
August	0.48	0.21	0.79	0.36	0.57	0.88	0.38	0.13	0.33	0.62	0.65	0.24	0	0.49	0.40	0
September	0	1.21	0.38	0.25	0	0.11	0	0.38	0	0.15	0	0.38	0	0.16	0	0
October	0	0	0	0	0.27	0	0	0	0.11	0	0	0	0.25	0	0	0
November	0	0	0	0	0	0	0	0	0	0	0	0	0	0.12	0	0
Annual Mean	0.13	0.28	0.27	0.17	0.14	0.20	0.10	0.07	0.10	0.10	0.10	0.10	0.03	0.10	0.05	0

(1) Unweighted Mean Monthly Catch per 12-hr Set.

Table F-5

SPATIAL DISTRIBUTION OF WHITE PERCH COLLECTED BY GILL NET(1), NINE MILE POINT VICINITY, 1977

Month	15-ft Contour				30-ft Contour				40-ft Contour				60-ft Contour			
	NMPW	NMPP	FITZ	NMPF	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE
April	0.73	0.62	1.76	2.67	0.69	0.71	0.22	0.38	0.14	0.13	1.25	0.14	0.26	0.05	0.07	0
May	1.86	12.55	5.89	8.82	1.36	1.30	1.30	0.39	0.44	0.42	0.97	0.76	0	0.10	0	0
June	3.30	3.42	2.07	13.99	0.70	1.20	0	0.40	0.27	0.10	0	0	0	0	0	0
July	7.48	7.06	9.77	19.37	1.01	2.39	3.80	7.45	0.73	1.17	4.19	6.07	0	0	0	0
August	4.37	7.42	4.50	14.09	0.10	0.36	0.92	1.68	0.26	0.27	0.31	0.24	0	0.24	0	0.12
September	9.87	15.80	7.41	6.95	1.38	1.34	1.09	2.69	0.69	1.49	0.54	0.26	0	0.23	0	0.13
October	7.04	31.18	16.38	13.38	6.70	5.65	10.57	10.48	6.51	7.50	12.62	18.57	1.74	5.35	6.26	4.79
November	0.11	2.38	2.04	2.61	1.17	0.51	3.55	2.76	1.02	2.14	4.08	5.34	1.22	2.85	8.25	10.09
Annual Mean	4.35	10.05	6.23	10.23	1.64	1.68	2.68	3.28	1.26	1.65	3.00	3.92	0.40	1.10	1.82	1.89

(1) Unweighted Mean Monthly Catch per 12-hr Set.

Table F-6

SPATIAL DISTRIBUTION OF YELLOW PERCH COLLECTED BY GILL NET[1], NINE MILE POINT VICINITY, 1977

Month	15-ft Contour				30-ft Contour				40-ft Contour				60-ft Contour			
	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE	NMPW	NMPP	FITZ	NMPE
April	0.15	0	0.15	0.23	0	0	0	0	0	0	0	0	0	0	0	0
May	0.32	3.17	2.78	0.85	0	0.13	0.14	0.26	0	0.10	0	0.11	0	0	0	0
June	1.70	2.62	1.33	3.31	0.64	0.43	0.53	1.24	0.29	0.11	0.36	0	0	0	0	0
July	7.17	7.31	9.62	4.90	0.65	0.84	0.38	1.07	0.32	0.74	1.11	0.46	0.15	0.13	0.44	0.51
August	3.55	2.86	2.16	2.78	1.01	0.37	1.53	0	1.15	0.35	0.41	0	0.13	0.11	0.26	0
September	2.71	4.16	4.30	11.28	0.35	0	0.69	0.23	0.61	0	0.11	0.87	0	0	0.36	0.13
October	0.77	1.53	4.14	3.71	1.95	1.09	1.76	2.40	1.01	1.03	2.60	3.00	0.87	2.03	1.34	3.28
November	0.47	0	0.36	1.46	0.20	0.39	0.12	0	0	0.47	0.11	0.12	0.09	0.13	0.25	0
Annual Mean	2.11	2.71	3.11	3.56	0.60	0.41	0.64	0.65	0.42	0.35	0.59	0.57	0.16	0.30	0.33	0.49

(1) Unweighted Mean Monthly Catch per 12-hr Set.

Table F-7

SPATIAL DISTRIBUTION OF TOTAL CATCH (ALL SPECIES COMBINED) COLLECTED BY BOTTOM TRAWL[a], NINE MILE POINT VICINITY, 1977

DATE	DAY[b] NIGHT	20-FT DEPTH CONTOUR NMPW	NMPP/ FITZ	NMPE	MEAN	40-FT DEPTH CONTOUR NMPW	NMPP/ FITZ	NMPE[c]	MEAN	60-FT DEPTH CONTOUR NMPW	NMPP/ FITZ	NMPE[c]	MEAN	DAILY MEAN
12 Apr	1128[D]	1	4	5	3.3	0	3[d]	105	36.0	1[d]	0[d]	925	308.7	247.3
12 Apr	2345[N]	8	7	7	7.3	0	1	768	256.3	0	1	2615	872.0	
27 Apr	0735[D]	0	0	0	0	0	0	0	0	0	0	0	0	2.3
27 Apr	0004[N]	0	2	11	4.3	0	0	12	4.0	5	8	3	5.3	
10 May	0955[D]	0	1	27	9.3	1	0	7[d]	2.6	1	1	205[d]	69.0	16.1
11 May	0035[N]	1	4[d]	6	3.7	4[d]	6[d]	1	3.7	5[d]	11	8	8.0	
24 May	0930[D]	28	12	2	14.0	0	5	188	64.3	5	0	21	8.7	22.7
24,25 May	2248[N]	3	2	9	4.7	3	5	47	18.3	2	26[d]	51	26.3	
15 Jun	1157[D]	0	0	0	0	0	0[d]	156	52.0	0	4	3	2.3	14.9
14,15 Jun	2255[N]	4	0	4	2.7	8	1	39	16.0	3	3	43	16.3	
28 Jun	0925[D]	0[d]	0[d]	0[d]	0	0[d]	0[d]	0[d]	0	0[d]	0[d]	0[d]	0	5.4
28,29 Jun	2310[N]	2	2	8	4.0	2	1	44	15.7	0	33	5	12.7	

[a]Catch per 15-min effort (± 1 min)

[b]Earliest time period recorded for sampling date

[c]Standard Yankee Trawl

[d]Not a standard 15 (± 1) minute tow

Table F-7 (CONTD)

SPATIAL DISTRIBUTION OF TOTAL CATCH (ALL SPECIES COMBINED) COLLECTED BY BOTTOM TRAWL[a], NINE MILE POINT VICINITY, 1977

DATE	DAY[b] NIGHT	20-FT DEPTH CONTOUR				40-FT DEPTH CONTOUR				60-DEPTH CONTOUR				DAILY MEAN
		NMPW	NMPP/ FITZ	NMPE	MEAN	NMPW	NMPP/ FITZ	NMPE[c]	MEAN	NMPW	NMPP/ FITZ	NMPE[c]	MEAN	
6 Jul	1302[D]	0	0	0	0	0	0	0	0	0	0	0	0	
5,6 Jul	2238[N]	31	0	9	13.3	2	6	394	134.0	15	9[d]	38[d]	20.7	28.0
19 Jul	1130[D]	0[d]	0	0	0	0	0	0	0	0[d]	0	0[d]	0	
19,20 Jul	2151[N]	0	0	0	0	1	0	0	0.3	13	2	160	58.3	9.8
2 Aug	1029[D]	0	0	0	0	0	0	0	0	0	0	0	0	
3,4 Aug	2354[N]	0	0[d]	30	10.0	0	0	6[d]	2.0	0	0	154	51.3	10.6
16 Aug	0906[D]	508	2165	0	891.0	0	0	0	0	0	0	0	0	
26,27 Aug	0055[N]	215	5	249	156.3	8	55	29	30.7	12	1	86	33.0	185.2
8 Sep	0943[D]	14	111	312	145.7	214	156	202	190.7	0	0	0	0	
7,8 Sep	2115[N]	134	316	147	199.0	96	1353	3905	1784.7	57	9	50	38.7	393.1
23 Sep	1110[D]	0	0	0	0	0	0	0	0	0	0	1	0.3	
20 Sep	1955[N]	85	56	259	133.3	34	29	118	60.3	15	0	10	8.3	33.7

[a] Catch per 15-min effort (± 1 min)

[b] Earliest time period recorded for sampling date

[c] Standard Yankee Trawl

[d] Not a standard 15 (± 1) minute tow

Table F-7 (CONTD)

SPATIAL DISTRIBUTION OF TOTAL CATCH (ALL SPECIES COMBINED) COLLECTED BY BOTTOM TRAWL[a], NINE MILE POINT VICINITY, 1977

DATE[e]	DAY[b] NIGHT	20-FT DEPTH CONTOUR NMPW	20-FT NMPP/ FITZ	20-FT NMPE	20-FT MEAN	40-FT DEPTH CONTOUR NMPW	40-FT NMPP/ FITZ	40-FT NMPE[c]	40-FT MEAN	60-FT DEPTH CONTOUR NMPW	60-FT NMPP/ FITZ	60-FT NMPE[c]	60-FT MEAN	DAILY MEAN
5,7 Oct	1556[D]	1	0	0	0.3	1	0	0	0.3	0	0	0	0	
5 Oct	1925[N]	1	0	0	0.3	1	1	107	36.3	3	4	30	12.3	8.3
25 Oct	1435[D]	0	0	0	0	0	0	0	0	0	0[d]	0	0	
25 Oct	1910[N]	1	0	0	0.3	0	0	0	0	5	0[d]	0	1.7	0.3
1 Nov	1243[D]	0	0	0	0	0	0	0	0	0	0	0	0	
1 Nov	1740[N]	6	2	0	2.7	0	1	41	14.0	9	4	68	27.0	7.3
15 Nov	1304[D]	0	0	0	0	0	0	7	2.3	0	0	6	2.0	
15 Nov	1541[N]	0	0	1	0.3	3	1	12	5.0	32	2	38	24.0	5.7
16 Dec	1416[D]	NS	NS	0	0	NS	0	0	0	NS	0	0	0	0
Annual	D	34.5	143.3	20.4		13.5	9.6	39.1		0.4	0.3	68.3		
Mean	N	30.7	24.8	46.3		10.1	91.3	345.2		11.0	7.1	209.9		

[a]Catch per 15-min effort (± 1 min)

[b]Earliest time period recorded for sampling date

[c]Standard Yankee Trawl

[d]Not a standard 15 (± 1) minute tow

[e]No trawl samples taken after 16 December, 1977 day samples.

NS = No sample taken due to weather

Table F-8

SPATIAL DISTRIBUTION OF ALEWIFE COLLECTED BY BOTTOM TRAWL[a], NINE MILE POINT VICINITY, 1977

		20-FT DEPTH CONTOUR				40-FT DEPTH CONTOUR				60-FT DEPTH CONTOUR				DAILY MEAN
		NMPW	NMPP/ FITZ	NMPE	MEAN	NMPW	NMPP/ FITZ	NMPE[c]	MEAN	NMPW	NMPP/ FITZ	NMPE[c]	MEAN	
12 Apr	1128[D]	1	3	3	2.3	0	0[d]	103	34.3	1[d]	0[d]	895	298.7	234.94
12 Apr	2345[N]	2	0	1	1.0	0	0	677	225.7	0	0	2543	847.7	
27 Apr	0735[D]	0	0	0	0	0	0	0	0	0	0	0	0	1.22
27 Apr	0004[N]	0	0	9	3.0	0	0	8	2.7	1	1	3	1.6	
10 May	0955[D]	0	0	0	0	0	0	6[d]	2.0	0	1	195[d]	65.3	12.67
11 May	0035[N]	1	2[d]	4	2.3	3[d]	4[d]	1	2.7	2[d]	8	1	3.7	
24 May	0930[D]	28	12	2	14.0	0	5	188	64.3	5	0	20	8.3	19.44
24,25 May	2248[N]	2	2	5	3.0	3	5	36	14.7	2	17[d]	18	12.3	
15 Jun	1157[D]	0	0	0	0	0	0[d]	0	0	0	0	1	0.3	0.72
14,15 Jun	2255[N]	1	0	1	0.7	0	1	4	1.7	1	1	3	1.7	
28 Jun	0925[D]	0[d]	0[d]	0[d]	0	0[d]	0[d]	0[d]	0	0[d]	0[d]	0[d]	0	0.39
28,29 Jun	2310[N]	0	0	1	0.3	1	1[d]	4	2.0	0	0	0	0	

[a]Catch per 15-min effort (± 1 min)

[b]Earliest time period recorded for sampling date

[c]Standard Yankee Trawl

[d]Not a standard 15 (± 1) minute tow

Table F-8 (CONTD)

SPATIAL DISTRIBUTION OF ALEWIFE COLLECTED BY BOTTOM TRAWL[a], NINE MILE POINT VICINITY, 1977

DATE	DAY[b] NIGHT	20-FT DEPTH CONTOUR NMPW	20-FT NMPP/ FITZ	20-FT NMPE	20-FT MEAN	40-FT DEPTH CONTOUR NMPW	40-FT NMPP/ FITZ	40-FT NMPE[c]	40-FT MEAN	60-FT DEPTH CONTOUR NMPW	60-FT NMPP/ FITZ	60-FT NMPE[c]	60-FT MEAN	DAILY MEAN
6 Jul	1302[D]	0	0	0	0	0	0	0	0	0	0	0	0	1.33
5,6 Jul	2238[N]	0	0	1	0.3	2	1	18	7.0	0	0[d]	2[d]	0.7	
19 Jul	1130[D]	0[d]	0	0	0	0	0	0	0	0[d]	0	0[d]	0	0.11
19,20 Jul	2151[N]	0	0	0	0	0	0	0	0	2	0	0	0.7	
2 Aug	1029[D]	0	0	0	0	0	0	0	0	0	0	0	0	1.72
3,4 Aug	2354[N]	0	0[d]	30	10.0	0	0	1[d]	0.3	0	0	0	0	
16 Aug	0906[D]	508	2165	0	891.0	0	0	0	0	0	0	0	0	179.67
26,27 Aug	0055[N]	214	5	247	155.3	8	42	0	16.7	3	1	41	15.0	
8 Sep	0943[D]	14	111	312	145.7	214	156	202	190.7	0	0	0		384.11
7,8 Sep	2115[N]	130	306	147	194.3	21	1346	3855	1740.7	48	4	48	33.3	
23 Sep	1110[D]	0	0	0	0	0	0	0	0	0	0	0	0	26.11
20 Sep	1955[N]	67	47	259	124.3	25	17	37	26.3	11	0	7	6.0	

[a]Catch per 15-min effort (± 1 min)

[b]Earliest time period recorded for sampling date

[c]Standard Yankee Trawl

[d]Not a standard 15 (± 1) minute tow

Table F-8 (CONTD)

SPATIAL DISTRIBUTION OF ALEWIFE COLLECTED BY BOTTOM TRAWL[a], NINE MILE POINT VICINITY, 1977

DATE[e]	DAY/NIGHT[b]	20-FT DEPTH CONTOUR				40-FT DEPTH CONTOUR				60-FT DEPTH CONTOUR				DAILY MEAN
		NMPW	NMPP/FITZ	NMPE	MEAN	NMPW	NMPP/FITZ	NMPE[c]	MEAN	NMPW	NMPP/FITZ	NMPE[c]	MEAN	
5,7 Oct	1556[D]	1	0	0	0.3	0	0	0	0	0	0	0	0	
5 Oct	1925[N]	0	0	0	0	0	0	3	1.0	1	0	1	0.7	0.33
25 Oct	1435[D]	0	0	0	0	0	0	0	0	0	0	0	0	
25 Oct	1910[N]	0	0	0	0	0	0	0	0 0	4	0[d]	0	1.3	
1 Nov	1243[D]	0	0	0	0	0	0	0	0	0	0	0	0	0.22
1 Nov	1740[N]	3	0	0	1.0	0	0	15	5.0	4	1	37	14.0	3.33
15 Nov	1304[D]	0	0	0	0	0	0	0	0	0	0	1	0.3	
15 Nov	1541[N]	0	0	0	0	0	0	4	1.3	10	0	7	5.7	1.22
16 Dec	1416[D]	NS	NS	0	0	NS	0	0	0	NS	0	0	0	
Annual Mean	D	34.5	143.2	18.6		12.6	10.1	29.4		0.4	0.1	65.4		0
	N	26.3	22.6	44.1		3.9	88.6	291.4		5.6	2.1	169.4		

a Catch per 15-min effort (± 1 min)

b Earliest time period recorded for sampling date

c Standard Yankee Trawl

d Not a standard 15 (± 1) minute tow.

e No samples were taken after 16 December, 1977 day samples.

NS = No sample taken due to weather

Table F-9

SPATIAL DISTRIBUTION OF RAINBOW SMELT COLLECTED BY BOTTOM TRAWL[a], NINE MILE POINT VICINITY, 1977

DATE	DAY[b] NIGHT	20-FT DEPTH CONTOUR				40-FT DEPTH CONTOUR				60-FT DEPTH CONTOUR				DAILY MEAN
		NMPW	NMPP/ FITZ	NMPE	MEAN	NMPW	NMPP/ FITZ	NMPE[c]	MEAN	NMPW	NMPP/ FITZ	NMPE[c]	MEAN	
12 Apr	1128[D]	0	0	0	0	0	1[d]	2	1.0	0[d]	0[d]	26	8.7	
12 Apr	2345[N]	0	1	1	0.7	0	1	89	30.0	0	1	61	20.7	10.17
27 Apr	0735[D]	0	0	0	0	0	0	0	0	0	0	0	0	
27 Apr	0004[N]	0	1	1	0.7	0	0	4	1.3	4	7	0	3.7	0.94
10 May	0955[D]	0	0	0	0	1	0	1[d]	0.7	0	0	8[d]	2.7	
11 May	0035[N]	0	0[d]	1	0.3	0[d]	2[d]	0	0.7	2[d]	3	6	3.7	1.33
24 May	0930[D]	0	0	0	0	0	0	0	0	0	0	0	0	
24 May	2248[N]	1	0	4	1.7	0	0	11	3.7	0	9[d]	33	14.0	3.22
15 Jun	1157[D]	0	0	0	0	0	0[d]	156	52.0	0	4	2	2.0	
14,15 Jun	2255[N]	2	0	3	1.7	8	0	35	14.3	1	2	40	14.3	14.06
28 Jun	0925[D]	0[d]	0[d]	0[d]	0	0[d]	0[d]	0[d]	0	0[d]	0[d]	0[d]	0	
28,29 Jun	2310[N]	1	0	5	2.0	1	0[d]	40	13.7	0	3	5	2.7	3.06

[a] Catch per 15-min effort (± 1 min)

[b] Earliest time period recorded for sampling date

[c] Standard Yankee Trawl

[d] Not a standard 15 (± 1) minute tow

Table F-9 (CONTD)

SPATIAL DISTRIBUTION OF RAINBOW SMELT COLLECTED BY BOTTOM TRAWL[a], NINE MILE POINT VICINITY, 1977

DATE	DAY[b] NIGHT	20-FT DEPTH CONTOUR				40-FT DEPTH CONTOUR				60-FT DEPTH CONTOUR				DAILY MEAN
		NMPW	NMPP/FITZ	NMPE	MEAN	NMPW	NMPP/FITZ	NMPE[c]	MEAN	NMPW	NMPP/FITZ	NMPE[c]	MEAN	
6 Jul	1302 D	0	0	0	0	0	0	0	0	0	0	0	0	
5,6 Jul	2238 N	30	0	8	12.7	0	5	365	123.3	14	9[d]	34[d]	19.0	25.83
19 Jul	1130 D	0[d]	0	0	0	0	0	0	0	0[d]	0	0[d]	0	
19,20 Jul	2151 N	0	0	0	0	1	0	0	0.3	11	2	160	57.7	9.67
2 Aug	1029 D	0	0	0	0	0	0	0	0	0	0	0	0	
3,4 Aug	2354 N	0	0[d]	0	0	0	0	5[d]	1.7	0	0	154	51.3	8.83
16 Aug	0906 D	0	0	0	0	0	0	0	0	0	0	0	0	
26,27 Aug	0055 N	0	0	2	0.7	0	13	29	14.0	8	0	45	17.7	5.39
8 Sep	0943 D	0	0	0	0	0	0	0	0	0	0	0	0	
7,8 Sep	2115 N	3	9	0	4.0	75	7	48	43.3	9	4	2	5.0	8.72
23 Sep	1110 D	0	0	0	0	0	0	0	0	0	0	1	0.3	
20 Sep	1955 N	13	5	0	6.0	8	10	80	32.7	2	0	3	1.7	6.78

[a] Catch per 15-min effort (± 1 min)

[b] Earliest time period recorded for smapling date.

[c] Standard Yankee Trawl

[d] Not a standard 15 (± 1) minute tow

Table F-9 (CONTD)

SPATIAL DISTRIBUTION OF RAINBOW SMELT COLLECTED BY BOTTOM TRAWL[a], NINE-MILE POINT VICINITY, 1977

DATE[e]	DAY/NIGHT[b]	20-FT DEPTH CONTOUR				40-FT DEPTH CONTOUR				60-FT DEPTH CONTOUR				DAILY MEAN
		NMPW	NMPP/FITZ	NMPE	MEAN	NMPW	NMPP/FITZ	NMPE[c]	MEAN	NMPW	NMPP/FITZ	NMPE[c]	MEAN	
5,7 Oct	1556[D]	0	0	0	0	0	0	0	0	0	0	0	0	7.50
5 Oct	1925[N]	0	0	0	0	1	0	101	34.0	1	4	29	11.3	
25 Oct	1435[D]	0	0	0	0	0	0	0	0	0	0	0	0	0.05
25 Oct	1910[N]	0	0	0	0	0	0	0	0	1	0[d]	0	0.3	
1 Nov	1243[D]	0	0	0	0	0	0	0	0	0	0	0	0	3.39
1 Nov	1740[N]	2	1	0	1.0	0	0	25	8.3	1	2	30	11.0	
15 Nov	1304[D]	0	0	0	0	0	0	7	2.3	0	0	4	1.3	3.72
15 Nov	1541[N]	0	0	1	0.3	3	1	1	1.7	20	1	29	16.7	
16 Dec	1416[D]	NS	NS	0		NS	0	0	0	NS	0	0	0	0
Annual Mean	D	0	0	0		0.1	0.1	9.8		0	0.2	2.4		
	N	3.3	1.1	1.6		6.1	2.4	52.1		4.6	2.9	39.4		

[a] Catch per 15-min effort (± 1 min)

[b] Earliest time period recorded for sampling date

[c] Standard Yankee Trawl

[d] Not a standard 15 (± 1) minute tow

[e] No samples were taken after 16 December, 1977 day samples.

NS = No sample taken due to weather

Table F-10

SPATIAL DISTRIBUTION OF TOTAL CATCH (ALL SPECIES COMBINED) COLLECTED BY SEINE[a], NINE MILE POINT VICINITY, 1977

DATE [c]	START TIME [b]	STATION				DAILY MEAN
		NMPW	NMPP	FITZ	NMPE	
7 APR	1720	5	2	4	NS	3.7
18 APR	1530	0	1	1	0	0.5
4,5 MAY	1700	0	0	0	5	1.3
20 MAY	0815	3	18	1	2	6.0
13 JUN	1750	1	94	4	0	24.8
28 JUN	2110	3	3	2	0	2.0
12 JUL	1945	14	6	4	14	9.5
30 JUL	1917	82	40	149	0	67.8
11 AUG	1900	561	265	1	467	323.5
26 AUG	1620	0	951	2	1	238.5
13 SEP	1720	0	4	185	101	72.5
29 SEP	1730	462	2	7	10	120.3
14 OCT	0945	0	214	0	0	53.5
29 OCT	1530	0	64	1	0	16.3
9 NOV	1600	0	0	0	0	0
30 NOV	1445	0	0	0	0	0
ANNUAL MEAN		70.7	104.0	22.6	40.0	59.6

[a]Number of fish per haul

[b]Earliest time period for sampling date

[c]No seine samples were taken in December 1977

NS = No sample taken; ice covered station

Table F-11

SPATIAL DISTRIBUTION OF ALEWIFE COLLECTED BY SEINE[a],
NINE MILE POINT VICINITY, 1977

DATE[c]	START TIME[b]	STATION				DAILY MEAN
		NMPW	NMPP	FITZ	NMPE	
7 APR	1720	1	0	1	NS	0.7
18 APR	1530	0	0	0	0	0
4,5 MAY	1700	0	0	0	5	1.3
20 MAY	0815	3	8	1	2	3.5
13 JUN	1750	0	3	0	0	0.8
28 JUN	2110	3	0	1	0	1.0
12 JUL	1945	14	0	0	10	6.0
30 JUL	1917	82	2	149	0	58.3
11 AUG	1900	535	0	0	2	134.3
26 AUG	1620	0	0	0	0	0
13 SEP	1720	0	0	185	1	46.5
29 SEP	1730	435	1	1	4	110.3
14 OCT	0945	0	0	0	0	0
29 OCT	1530	0	1	0	0	0.3
9 NOV	1600	0	0	0	0	0
30 NOV	1445	0	0	0	0	0
ANNUAL MEAN		67.1	0.9	21.1	1.6	22.7

[a]Number of fish per haul

[b]Earliest time period for sampling date

[c]No seine samples were taken in December 1977

NS = No samples taken; ice covered station

Table F-12

SPATIAL DISTRIBUTION OF WHITE PERCH COLLECTED BY SEINE[a], NINE MILE POINT VICINITY, 1977

DATE[c]	START TIME[b]	STATION				DAILY MEAN
		NMPW	NMPP	FITZ	NMPE	
7 APR	1720	0	0	0	NS	0
18 APR	1530	0	0	0	0	0
4,5 MAY	1700	0	0	0	0	0
20 MAY	0815	0	0	0	0	0
13 JUN	1750	0	0	0	0	0
28 JUN	2110	0	0	0	0	0
12 JUL	1945	0	0	0	0	0
30 JUL	1917	0	6	0	0	1.5
11 AUG	1900	26	22	0	399	111.8
26 AUG	1620	0	892	0	0	223.0
13 SEP	1720	0	1	0	86	21.8
29 SEP	1730	2	0	0	0	0.5
14 OCT	0945	0	165	0	0	41.3
24 OCT	1530	0	2	0	0	0.5
9 NOV	1600	0	0	0	0	0
30 NOV	1445	0	0	0	0	0
ANNUAL MEAN		1.8	68.0	0	32.3	25.5

[a]Number of fish per haul

[b]Earliest time period for sampling date

[c]No seine samples were taken in December 1977

NS = No sample taken; ice covered station

Table F-13

SPATIAL DISTRIBUTION OF YELLOW PERCH COLLECTED BY SEINE[a], NINE MILE POINT VICINITY, 1977

DATE[c]	START TIME[b]	STATION				DAILY MEAN
		NMPW	NMPP	FITZ	NMPE	
7 APR	1720	0	0	0	NS	0
18 APR	1530	0	0	0	0	0
4,5 MAY	1700	0	0	0	0	0
20 MAY	0815	0	5	0	0	1.3
13 JUN	1750	0	21	0	0	5.3
28 JUN	2110	0	3	0	0	0.8
12 JUL	1945	0	2	1	0	0.8
30 JUL	1917	0	1	0	0	0.3
11 AUG	1900	0	0	0	4	1.0
26 AUG	1620	0	0	1	0	0.3
13 SEP	1720	0	0	0	2	0.5
29 SEP	1730	0	0	0	0	0
14 OCT	0945	0	2	0	0	0.5
24 OCT	1530	0	0	0	0	0
9 NOV	1600	0	0	0	0	0
30 NOV	1445	0	0	0	0	0
ANNUAL MEAN		0	2.1	0.1	0.4	0.7

[a]Number of fish per haul

[b]Earliest time period for sampling date

[c]No seine samples were taken in December 1977

NS = No sample taken; ice covered station

Table F-14

SPATIAL DISTRIBUTION OF TOTAL CATCH (ALL SPECIES COMBINED) COLLECTED BY TRAP NET[a], NINE MILE POINT VICINITY, 1977[b]

DATE	STATION				DAILY MEAN
	NMPW	NMPP	FITZ	NMPE	
25, 26 MAY[c]	0	1	0	3	1.0
14, 15 JUN[c]	3	13	11	4	7.8
28, 29 JUN	2	12	2	10	6.5
14, 15 JUL	1	4	3	4	3.0
27, 28 JUL	3	0	1	2	1.5
11, 12 AUG	2	0	0	1	0.8
26, 27 AUG	12	4	18	15	12.3
13, 14 SEP	6	4	6	2	4.5
29, 30 SEP	0	1	1	4	1.5
18, 19 OCT	3	1	0	0	1.0
25, 26 OCT	3	13	0	1	4.3
09, 10 NOV	0	9	0	0	2.3
30 NOV, 1 DEC	0	1	0	0	0.3
ANNUAL MEAN	2.7	4.8	3.2	3.5	3.6

[a]Number of fish per haul

[b]No trap net samples were taken in December

[c]Trap nets were set at the 15-ft contour for the first two sampling periods. All other sets were at the 20-ft contour.

Table F-15

LENGTH FREQUENCY OF ALEWIFE COLLECTED BY
GILL NET DURING 1977,
NINE MILE POINT VICINITY

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
71- 80								
81- 90							1	
91- 100				2	3		1	1
101- 110		1		1	1		9	2
111- 120	6	22	1	2			2	1
121- 130	31	220	23	26	1			
131- 140	33	205	30	119	9		1	1
141- 150	44	59	76	442	96		5	10
151- 160	162	100	115	572	104		30	36
161- 170	439	357	90	242	44		47	30
171- 180	206	365	24	66	3		23	17
181- 190	15	38	2	7	3		19	10
191- 200	1	1			1		5	3
201- 210	1	2		1			2	
211- 220	1	1						
221- 239		1						

Table F-16

LENGTH FREQUENCY OF RAINBOW SMELT COLLECTED BY GILL NET DURING 1977, NINE MILE POINT VICINITY

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
71- 80								
81- 90					1			
91- 100								
101- 110				1	1			
111- 120	2	1						1
121- 130	3	2	3	1	2			
131- 140	29	13	13	2			1	2
141- 150	183	45	32	23		1	11	15
151- 160	282	83	77	19	1	1	52	41
161- 170	198	66	106	35		6	106	96
171- 180	70	39	94	17		2	104	77
181- 190	13	17	51	21		1	58	50
191- 200	17	4	20	21			21	32
201- 210	13	1	16	6		1	13	17
211- 220	4	4	9	4			5	5
221- 230	2	4	7	4			1	2
231- 240	4	3	6	2			1	1
241- 250	4	3	3	2				
251- 260	1	2	4					1
261- 270	4							
271- 280	2	1						1
281- 290								
291- 300		1						
301- 310								
311- 320		1						

Table F-17

LENGTH FREQUENCY OF SMALLMOUTH BASS COLLECTED BY
GILL NET DURING 1977,
NINE MILE POINT VICINITY

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
141- 150								
151- 160				1				
161- 170								
171- 180			1	2	2			
181- 190					2			
191- 200								
201- 210				1	3			
211- 220								
221- 230								
231- 240					3			
241- 250			1	2	1	1		
251- 260					2		2	
261- 270			3		4	1		
271- 280				2	7	3		
281- 290			1	2	5			
291- 300				1	9	1		1
301- 310			1		4	1		
311- 320				1	4	3	1	
321- 330			1		2		1	
331- 340				1	2			
341- 350					1	3		
351- 360				4	2			
361- 370		1		1	1			
371- 380		1		2	2	3		
381- 390	1	1	1	1	3	1		
391- 400			1		6	4		
401- 410	1	1				2		
411- 420		1			2	2		
421- 430		1		1				

Table F-18

LENGTH FREQUENCY OF WHITE PERCH COLLECTED BY
GILL NET DURING 1977,
NINE MILE POINT VICINITY

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
51- 60							1	
61- 70								
71- 80						3	34	11
81- 90					7	21	406	149
91- 100					1	22	375	136
101- 110					1	15	82	37
111- 120		3	2			6	42	29
121- 130		1	2	1	1	2	14	7
131- 140	1		1			1	2	
141- 150	4	9	1	2				
151- 160	6	16	3	9				2
161- 170	7	20	1	19	9	1	1	1
171- 180	1	8	2	23	12	3	1	
181- 190	4	5		27	36	26	7	
191- 200	2	3	6	63	36	38	28	1
201- 210	5	20	16	62	53	52	47	2
211- 220	12	62	42	81	48	71	69	2
221- 230	17	49	36	113	40	61	35	1
231- 240	11	30	36	84	15	41	20	5
241- 250	10	20	24	70	10	21	14	1
251- 260	3	17	12	28	7	12		1
261- 270	3	13	14	25	2	9	1	1
271- 280	10	12	2	17	2	1		
281- 290	2	3	5	10		6	2	
291- 300	6	5	2	7	4	5		
301- 310	2	3	2			2		
311- 320		3				1		
321- 330				2				
331- 340	1	1						
341- 350		1	1					
351- 360								
361- 370		1						
401- 410								
411- 420		1						

Table F-19

LENGTH FREQUENCY OF YELLOW PERCH COLLECTED BY
GILL NET DURING 1977
NINE MILE POINT VICINITY

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
71- 80								
81- 90						1		
91- 100				2		7	7	1
101- 110		2	3	7		4	29	2
111- 120		1	7	9			10	
121- 130		3	3	14	3			
131- 140		6	9	13	4		1	
141- 150		17	4	31	6	2	2	1
151- 160	1	10	2	22	5	3	11	
161- 170		7	6	16	12	5	8	1
171- 180	3	5	7	28	24	19	36	2
181- 190	1	13	12	46	23	36	59	6
191- 200		6	6	30	25	47	56	10
201- 210		5	11	24	12	33	30	7
211- 220		2	4	22	16	34	17	2
221- 230		1	3	15	5	11	9	
231- 240			2	8	5	14	11	
241- 250			8	9	10	15	1	1
251- 260			13	20	11	9	4	
261- 270	1	1	7	13	2	9	1	
271- 280	1	1	7	5	5	2	2	
281- 290			2	3		1	1	
291- 300		1	1	5		1	1	
301- 310			1	1				
311- 320			2	1				
321- 330				1				
331- 340					1			

Table F-20

LENGTH FREQUENCY OF ALEWIVES COLLECTED BY TRAWLING IN VICINITY OF NINE MILE POINT, 1977

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
11-20	—	—	—	—	13	—	—	—
21-30	—	—	—	—	57	33	—	—
31-40	—	—	—	—	61	222	—	1
41-50	—	—	—	—	65	323	2	4
51-60	—	—	—	—	68	124	2	28
61-70	—	—	—	—	21	23	5	30
71-80	—	—	—	—	2	4	—	10
81-90	—	—	—	—	—	1	—	1
91-100	—	—	—	—	—	—	—	—
101-110	—	—	—	—	—	—	—	—
111-120	—		1	1	—	—	—	—
121-130	11	20	—	1	—	—	—	—
131-140	40	59	6	9	—	—	—	—
141-150	79	101	6	9	—	—	—	1
151-160	56	39	5	6	—	—	—	1
161-170	60	32	2	2	—	—	—	3
171-180	25	20	—	—	—	—	—	2
181-190	2	3	—	—	—	—	—	—

Table F-21

LENGTH FREQUENCY OF RAINBOW SMELT COLLECTED BY TRAWLING IN VICINITY OF NINE MILE POINT, 1977

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
21-30	—	—	—	1	—	—	—	—
31-40	—	—	—	—	10	11	4	—
41-50	1	1	—	1	48	39	5	6
51-60	10	7	9	13	46	80	15	43
61-70	32	22	53	29	3	37	25	37
71-80	36	32	50	29	1	9	20	19
81-90	14	7	35	42	4	2	1	6
91-100	2	1	7	14	16	1	—	1
101-110	3	1	9	21	10	—	—	1
111-120	4	—	11	7	—	4	—	—
121-130	4	—	5	8	—	3	1	—
131-140	9	1	4	7	—	—	1	4
141-150	20	4	—	5	—	2	2	3
151-160	12	3	2	3	—	1	—	1
161-170	12	1	2	6	—	—	—	3
171-180	7	—	1	1	—	—	1	3
181-190	3	2	—	1	—	1	—	—
191-200	1	—	1	3	—	1	—	—

Table F-22

LENGTH FREQUENCY OF ALEWIVES COLLECTED BY SEINING IN VICINITY OF NINE MILE POINT, 1977

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
11-20	—	—	—	2	—	—	—	—
21-30	—	—	—	65	2	30	—	—
31-40	—	—	—	13	20	11	—	—
41-50	—	—	—	1	19	14	—	—
51-60	—	—	—	—	1	27	1	—
61-70	—	—	—	—	—	3	—	—
71-80	—	—	—	—	—	1	—	—
81-90	—	—	—	—	—	—	—	—
91-100	—	—	—	—	—	—	—	—
101-110	—	—	—	—	—	—	—	—
111-120	—	—	2	—	—	—	—	—
121-130	—	1	—	—	—	—	—	—
131-140	—	4	1	—	—	—	—	—
141-150	1	6	3	—	—	—	—	—
151-160	—	4	—	—	—	—	—	—
161-170	—	3	1	—	—	—	—	—
171-180	1	1	—	—	—	—	—	—

Table F-23

LENGTH FREQUENCY OF WHITE PERCH COLLECTED BY SEINING IN VICINITY OF NINE MILE POINT, 1977

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
21-30	—	—	—	—	—	—	—	—
31-40	—	—	—	—	14	1	—	—
41-50	—	—	—	3	12	2	—	—
51-60	—	—	—	2	28	4	—	—
61-70	—	—	—	1	35	4	—	—
71-80	—	—	—	—	18	6	1	—
81-90	—	—	—	—	20	18	1	—
91-100	—	—	—	—	1	6	8	—
101-110	—	—	—	—	—	1	20	—
111-120	—	—	—	—	—	—	12	—
121-130	—	—	—	—	—	—	1	—

Table F-24

LENGTH FREQUENCY OF YELLOW PERCH COLLECTED BY SEINING IN VICINITY OF NINE MILE POINT, 1977

Length Range (mm)	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
21-30	–	–	–	–	–	–	–	–
31-40	–	–	–	–	2	–	–	–
41-50	–	–	–	1	–	–	–	–
51-60	–	–	–	–	1	–	–	–
61-70	–	–	–	–	2	–	–	–
71-80	–	–	–	–	–	–	1	–
81-90	–	–	–	–	–	1	–	–
91-100	–	–	–	–	–	–	1	–
101-110	–	–	3	–	–	1	–	–
111-120	–	1	1	–	–	–	–	–
121-130	–	–	3	1	–	–	–	–
131-140	–	–	2	–	–	–	–	–
141-150	–	–	3	–	–	–	–	–
151-160	–	–	1	–	–	–	–	–
161-170	–	–	5	–	–	–	–	–
171-180	–	2	–	–	–	–	–	–
181-190	–	1	4	–	–	–	–	–
191-200	–	–	1	1	–	–	–	–
201-210	–	1	1	1	–	–	–	–

Table F-25

COEFFICIENTS OF MATURITY[1] FOR SMALLMOUTH BASS COLLECTED BY GILL NET AT CONTROL (NMPW AND NMPE) AND EXPERIMENTAL (NMPP AND FITZ) TRANSECTS, NINE MILE POINT VICINITY, 1977

	Males		Females	
Month	Control Transects	Experimental Transects	Control Transects	Experimental Transects
June	NT	0.36 ± 0	NT	0.87 ± 0.36
July	0.15 ± 0.01	0.24 ± 0.07	3.26 ± 1.46	2.16 ± 1.21
August	0.20 ± 0.10	0.42 ± 0.27	0.87 ± 0.41	1.16 ± 0.81
September	0.75 ± 0.32	0.43 ± 0.13	1.37 ± 0.60	0.88 ± 0.35
October[2]	0.43 ± 0.15	NT	NT	NT
November[3]	NT	NT	NT	NT

(1) Mean monthly Coefficient of Maturity ± Standard deviation

(2) Only four smallmouth bass were collected in October

(3) Only one smallmouth bass was collected in October

Table F-26

COEFFICIENTS OF MATURITY[(1)] FOR WHITE PERCH COLLECTED BY GILL NET AT CONTROL (NMPW AND NMPE AND EXPERIMENTAL (NMPP AND FITZ) TRANSECTS, NINE MILE POINT VICINITY, 1977

	Males		Females	
Month	Control Transects	Experimental Transects	Control Transects	Experimental Transects
June	3.56 ± 1.25	3.40 ± 1.64	6.94 ± 3.00	6.96 ± 2.44
July	2.31 ± 1.13	2.26 ± 1.07	3.39 ± 5.20	2.80 ± 1.20
August	0.31 ± 0.23	0.25 ± 0.15	0.91 ± 0.46	0.89 ± 0.40
September	1.08 ± 1.07	0.79 ± 0.84	0.93 ± 0.37	1.10 ± 0.63
October	3.73 ± 1.64	2.70 ± 1.60	2.60 ± 1.04	1.48 ± 0.83
November	3.84 ± 4.84	1.16 ± 0.72	1.70 ± 1.21	1.27 ± 1.14

(1) Mean Monthly Coefficient of Maturity ± Standard deviation

Table F-27

COEFFICIENTS OF MATURITY[1] FOR YELLOW PERCH COLLECTED BY GILL NET AT CONTROL (NMPW AND NMPE) AND EXPERIMENTAL (NMPP AND FITZ) TRANSECTS, NINE MILE POINT VICINITY, 1977

	Males		Females	
Month	Control Transects	Experimental Transects	Control Transects	Experimental Transects
June	0.66 ± 0.68	0.52 ± 0.40	1.21 ± 2.01	0.92 ± 0.27
July	0.40 ± 0.34	0.32 ± 0.35	0.53 ± 0.27	0.74 ± 0.36
August	0.69 ± 0.63	0.91 ± 1.05	1.09 ± 0.63	0.81 ± 0.37
September	5.46 ± 2.62	3.80 ± 2.30	1.69 ± 0.62	1.69 ± 0.67
October	7.76 ± 2.36	7.80 ± 1.71	4.08 ± 1.64	2.97 ± 1.86
November	6.34 ± 0.85	5.77 ± 0.66	7.08 ± 1.41	5.80 ± 2.47

(1) Mean Monthly Coefficient of Maturity ± Standard deviation

Table F-28

FECUNDITY OF ALEWIVES COLLECTED BY GILL NET IN THE VICINITY OF NINE MILE POINT, 1977

Length Class (mm)	No. of Fish	Total Length (mm) Mean	Range	No. of Yolk Eggs Mean	SD*
141-150	3	147	146-147	10,280	725
151-160	10	156	152-159	17,532	5,902
161-170	4	165	163-168	23,568	7,358
171-180	1	179	—	26,230	—
181-190	1	183	—	20,328	—

*Standard deviation

Table F-29

FECUNDITY OF RAINBOW SMELT COLLECTED BY GILL NET IN THE VICINITY OF NINE MILE POINT, 1977

Length Class (mm)	No. of Fish	Total Length (mm) Mean	Range	No. of Yolk Eggs Mean	SD*
151-160	1	156		9,900	
161-170	2	169	168-170	11,320	3,195

*Standard deviation

Table F-30

FECUNDITY OF SMALLMOUTH BASS COLLECTED BY GILL NET IN THE VICINITY OF NINE MILE POINT, 1977

Length Class (mm)	No. of Fish	Total Length (mm) Mean	Range	No. of Yolk Eggs Mean	SD*
271-280	1	280	—	2,840	—
331-340	1	337	—	6,239	—
351-360	2	357	355-359	6,280	694
361-370	1	365	—	5,570	—
381-390	2	384	382-385	8,862	3,184
391-400	1	392	—	20,371	—

*Standard deviation

Table F-31

FECUNDITY OF WHITE PERCH COLLECTED BY GILL NET IN THE VICINITY OF NINE MILE POINT, 1977

Length Class (mm)	No. of Fish	Total Length (mm) Mean	Range	No. of Yolk Eggs Mean	SD*
141-150	1	146	—	9,258	—
161-170	1	170	—	24,101	—
201-210	1	210	—	90,158	—
211-220	8	218	215-220	75,998	27,704
221-230	1	227	—	80,210	—
231-240	7	234	232-238	100,171	28,688
241-250	1	250	—	93,401	—
251-260	1	260	—	173,694	—
291-300	1	298	—	489,652	—
311-320	1	320	—	150,834	—

*Standard deviation

Table F-32

AGE CLASS DISTRIBUTION OF SMALLMOUTH BASS COLLECTED BY GILL NET AT CONTROL (NMPW AND NMPE) AND EXPERIMENTAL (NMPP AND FITZ) TRANSECTS, NINE MILE POINT VICINITY, 1977

	Control Transects			Experimental Transects		
		Total Length (mm)			Total Length (mm)	
Age Class	No.	Mean	Range	No.	Mean	Range
0	0			0		
I	0			0		
II	2	193.0	180-206	2	180.5	177-184
III	2	238.0	237-239	0		
IV	15	281.6	244-318	17	274.6	220-314
V	2	293.0	260-326	1	308.0	-
VI	4	339.2	327-351	2	374.0	356-392
VII	2	357.5	356-359	2	368.5	355-382
VIII	1	421.0	-	1	373.0	-
IX	3	388.3	377-410	3	389.0	365-429
X	2	391.0	385-397	1	396.0	-
XI	1	403.0	-	1	392.0	-

Table F-33

AGE CLASS DISTRIBUTION OF WHITE PERCH COLLECTED BY GILL NET AT CONTROL (NMPW AND NMPE) AND EXPERIMENTAL (NMPP AND FITZ) TRANSECTS, NINE MILE POINT VICINITY, 1977

Age Class	Control Transects No.	Control Transects Total Length (mm) Mean	Control Transects Total Length (mm) Range	Experimental Transects No.	Experimental Transects Total Length (mm) Mean	Experimental Transects Total Length (mm) Range
0	5	100.2	85-123	14	100.7	82-130
I	0			0		
II	4	191.8	150-222	11	185.0	150-225
III	10	210.7	184-238	14	220.6	164-248
IV	16	223.3	217-234	20	220.6	149-255
V	7	237.4	222-259	5	238.2	204-278
VI	4	215.3	191-235	6	277.2	257-298
VII	1	245.0	-	1	266.0	-

Table F-34

AGE CLASS DISTRIBUTION OF YELLOW PERCH COLLECTED BY GILL NET AT CONTROL (NMPW AND NMPE) AND EXPERIMENTAL (NMPP AND FITZ) TRANSECTS, NINE MILE POINT VICINITY, 1977

Age Class	Control Transects No.	Control Transects Total Length (mm) Mean	Control Transects Total Length (mm) Range	Experimental Transects No.	Experimental Transects Total Length (mm) Mean	Experimental Transects Total Length (mm) Range
0	0			0		
I	1	105.0	-	3	111.0	111-116
II	11	144.2	112-185	6	163.0	132-184
III	14	183.4	131-193	25	177.8	138-212
IV	18	192.6	162-235	17	203.1	171-238
V	9	224.3	198-265	8	249.9	190-271
VI	3	280.7	241-330	2	264.5	249-280
VII	1	311.0	-	0		
VIII	1	312.0	-	0		

Table F-35

STOMACH CONTENT ANALYSIS FOR SMALLMOUTH BASS COLLECTED BY GILL NET, NINE MILE POINT VICINITY, 1977

CONTROL TRANSECTS (NMPW AND NMPE)

Size Range (mm) 265-414
No. of Stomachs Examined 12
No. of Empty Stomachs 1

Food Item	Life Stage	Occurrences No.	Occurrences %	Abundance No.	Abundance %	Importance Index
Astacidae	Adult	1	9.09	1	4.35	7.13
Unid. Fish	Undetermined	5	45.45	3	13.04	28.65
Unid. Fish	Juvenile	1	9.09	9	39.13	3.56
Alewife	Postlarvae	1	9.09	4	17.39	7.13
Alewife	Juvenile	2	18.18	5	21.74	17.82
Rainbow Smelt	Adult	1	9.09	1	4.35	14.26
Digest. Matter	Undetermined	2	18.18		0.0	14.26
Fish Scales	Undetermined	1	9.09		0.0	7.13
Aquat. Insect Remains	Undetermined	1	9.09		0.0	0.07

EXPERIMENTAL TRANSECTS (NMPP AND FITZ)

Size Range (mm) 179-413
No. of Stomachs Examined 4
No. of Empty Stomachs 0

Food Item	Life Stage	Occurrences No.	Occurrences %	Abundance No.	Abundance %	Importance Index
Astacidae	Adult	1	25.00	0	0.0	7.50
Unid. Fish	Undetermined	2	50.00	1	100.00	32.50
Digest. Matter	Undetermined	3	75.00	0	0.0	60.00

Table F-36

STOMACH CONTENT ANALYSIS FOR WHITE PERCH COLLECTED BY GILL NET, NINE MILE POINT VICINITY, 1977

CONTROL TRANSECTS (NMPW AND NMPE)

Size Range (mm)	182-274
No. of Stomachs Examined	25
No. of Empty Stomachs	3

Food Item	Life Stage	Occurrences No.	Occurrences %	Abundance No.	Abundance %	Importance Index
Filament, Algae	Undetermined	6	27.27	0	0.0	1.62
Daphnia sp.	Adult	12	54.55	113	8.07	3.75
Daphnia sp.	Immature	3	13.64	4	0.29	0.10
Leptodora kindti	Adult	12	54.55	236	16.86	9.15
Cladocera	Adult	1	4.55	389	27.79	3.23
Cladocera	Undetermined	4	18.18	0	0.0	0.19
Calanoida	Undetermined	1	4.55	1	0.07	0.03
Cyclopoida	Copepodid	2	9.09	3	0.21	0.06
Gammarus fasciatus	Adult	10	45.45	353	25.21	27.89
Amphipoda	Adult	8	36.36	87	6.21	7.08
Athripsodes sp.	Pupae	1	4.55	2	0.14	2.59
Trichoptera	Undetermined	1	4.55	0	0.0	0.03
Chironomus sp.	Larvae	4	18.18	9	0.64	0.13
Cryptochironomous sp.	Larvae	3	13.64	3	0.21	0.10
Cricotopus	Larvae	2	9.09	2	0.14	0.16
Dicrotendipes sp.	Larvae	1	4.55	1	0.07	0.03
Polypedilum sp.	Larvae	1	4.55	2	0.14	0.03
Phaenopsectra sp.	Larvae	4	18.18	4	0.29	0.52
Chironomidae	Pupae	4	18.18	24	1.71	0.58
Chironomidae	Larvae	3	13.64	23	1.64	0.23
Diptera	Pupae	1	4.55	1	0.07	0.03
Insecta	Adult	1	4.55	1	0.07	0.03
Invertebrate	Egg	1	4.55	56	4.00	0.32
Unid. Fish	Postlarvae	6	27.27	55	3.93	21.98
Alewife	Postlarvae	5	22.73	31	2.21	14.22
Digest. Matter	Undetermined	9	40.91	0	0.0	5.53
Fish Scales (Cycl)	Undetermined	1	4.55	0	0.0	0.03
Aquat. Insect Remains	Undetermined	3	13.64	0	0.0	0.16
Terr. Insect Remains	Adult	1	4.55	0	0.0	0.03
Sand Grains	Undetermined	3	13.64	0	0.0	0.16

EXPERIMENTAL TRANSECTS (NMPP AND FITZ)

Size Range (mm)	168-245
No. of Stomachs Examined	25
No. of Empty Stomachs	2

Food Item	Life Stage	Occurrences No.	Occurrences %	Abundance No.	Abundance %	Importance Index
Filament, Algae	Undetermined	7	30.43	0	0.0	0.96
Hydrozoa	Undetermined	1	4.35	0	0.0	0.72
Bosmina sp.	Adult	1	4.35	1	0.04	0.02
Chrdoridae	Adult	1	4.35	1	0.04	0.02
Daphnia sp.	Adult	12	52.17	242	9.06	4.45
Daphnia sp.	Immature	1	4.35	1	0.04	0.07
Leptodora kindti	Adult	13	56.52	913	34.19	11.46
Cladocera	Adult	2	8.70	5	0.19	0.05
Cladocera	Undetermined	1	4.35	0	0.0	0.10
Ostracoda	Adult	1	4.35	1	0.04	0.10
Calanoida	Adult	1	4.35	1	0.04	0.02
Cyclopoida	Adult	3	13.04	5	0.19	0.22
Cyclopoida	Copepodid	1	4.35	1	0.04	0.10
Gammarus fasciatus	Adult	10	43.48	1122	42.02	44.03
Pontoporeia affinis	Adult	3	13.04	23	0.86	0.22
Amphipoda	Adult	7	30.43	118	4.42	4.07
Astacidae	Immature	1	4.35	1	0.04	0.10
Astacidae	Undetermined	1	4.35	0	0.0	0.10
Oecetis sp.	Pupae	1	4.35	1	0.04	0.48
Athripsodes sp.	Pupae	1	4.35	1	0.04	0.02
Athripsodes sp.	Larvae	1	4.35	2	0.07	0.10
Chironomus sp.	Larvae	2	8.70	2	0.07	0.12
Dicrotendipes sp.	Larvae	1	4.35	3	0.11	0.10
Microtendipes sp.	Larvae	1	4.35	1	0.04	0.10
Chironomidae	Pupae	13	56.52	58	2.17	3.20
Chironomidae	Larvae	2	8.70	8	0.30	0.12
Diptera	Pupae	1	4.35	1	0.04	0.10
Invertebrate	Egg	5	21.74	63	2.36	0.14
Unid. Fish	Undetermined	1	4.35	1	0.04	2.39
Unid. Fish	Postlarvae	7	30.43	40	1.50	5.69
Alewife	Postlarvae	4	17.39	51	1.91	7.18
Alewife	Juvenile	1	4.35	3	0.11	5.02
Terr. Vegetation	Undetermined	1	4.35	0	0.0	1.91
Digest Matter	Undetermined	6	26.09	0	0.0	6.24

Table F-37

STOMACH CONTENT ANALYSIS FOR YELLOW PERCH COLLECTED BY GILL NET, NINE MILE POINT VICINITY, 1977

CONTROL TRANSECTS (NMPW AND NMPE)

Size Range (mm) 162-278
No. of Stomachs Examined 25
No. of Empty Stomachs 4

Food Item	Life Stage	Occurrences No.	Occurrences %	Abundance No.	Abundance %	Importance Index
Filament, Algae	Undetermined	8	38.10	0	0.0	0.34
Physa sp.	Adult	2	9.52	8	2.81	2.56
Daphnia sp.	Adult	1	4.76	1	0.35	0.03
Gammarus fasciatus	Adult	10	47.62	162	56.84	18.17
Amphipoda	Adult	8	38.10	23	8.07	5.64
Astacidae	Adult	3	14.29	7	2.46	16.01
Astacidae	Immature	1	4.76	1	0.35	0.03
Astacidae	Undetermined	1	4.76	0	0.0	1.85
Astacidae	Juvenile	3	14.29	3	1.05	2.16
Heptageniidae	Nymph	1	4.76	1	0.35	0.62
Athripsodes sp.	Larvae	1	4.76	2	0.70	0.31
Trichoptera	Undetermined	1	4.76	1	0.35	0.03
Chironomus sp.	Larvae	1	4.76	1	0.35	0.03
Dicrotendipes sp.	Larvae	1	4.76	1	0.35	0.03
Chironomidae	Pupae	4	19.05	4	1.40	0.40
Chironomidae	Larvae	3	14.29	3	1.05	0.68
Unid. Fish	Undetermined	9	42.86	13	4.56	13.74
Unid. Fish	Juvenile	2	9.52	7	2.46	1.32
Unid. Fish	Postlarvae	2	9.52	2	0.70	1.54
Mottled Sculpin	Juvenile	2	9.52	12	4.21	15.09
Cottus sp.	Juvenile	5	23.81	32	11.23	19.22
Digest. Matter	Undetermined	2	9.52	0	0.0	0.06
Aquat. Insect Remains	Undetermined	2	9.52	1	0.35	0.06
Pebbles-Stones	Undetermined	2	9.52	0	0.0	0.06
Sand Grains	Undetermined	1	4.76	0	0.0	0.03

EXPERIMENTAL TRANSECTS (NMPP AND FITZ)

Size Range (mm) 129-277
No. of Stomachs Examined 24
No. of Empty Stomachs 2

Food Item	Life Stage	Occurrences No.	Occurrences %	Abundance No.	Abundance %	Importance Index
Filament, Algae	Undetermined	13	59.09	0	0.0	0.74
Gastropoda	Undetermined	1	4.55	1	0.05	0.02
Bosmina sp.	Adult	1	4.55	1	0.05	0.08
Daphnia sp.	Adult	1	4.55	11	0.55	0.08
Daphnia sp.	Immature	1	4.55	1	0.05	0.04
Leptodora kindti	Adult	1	4.55	1	0.05	0.04
Cladocera	Undetermined	1	4.55	0	0.0	0.04
Calanoida	Undetermined	1	4.55	1	0.05	0.08
Cyclopoida	Adult	1	4.55	3	0.15	0.08
Gammarus fasciatus	Adult	18	81.82	1806	90.80	60.43
Amphipoda	Adult	7	31.82	99	4.98	3.17
Amphipoda	Undetermined	1	4.55	0	0.0	0.04
Astacidae	Undetermined	1	4.55	1	0.05	1.65
Astacidae	Juvenile	1	4.55	1	0.05	3.71
Hydroptilidae	Larvae	1	4.55	0	0.0	0.02
Athripsodes sp.	Pupae	1	4.55	1	0.05	0.02
Athripsodes sp.	Larvae	1	4.55	5	0.25	0.08
Leptoceridae	Larvae	1	4.55	1	0.05	0.06
Trichoptera	Undetermined	1	4.55	0	0.0	0.06
Chironomus sp.	Larvae	3	13.64	4	0.20	0.12
Polypedilum sp.	Larvae	1	4.55	1	0.05	0.08
Microtendipes sp.	Larvae	1	4.55	2	0.10	0.08
Procladius sp.	Larvae	1	4.55	1	0.05	0.08
Phaenopsectra sp.	Larvae	1	4.55	5	0.25	0.08
Microspectra sp.	Larvae	1	4.55	1	0.05	0.08
Chironomidae	Pupae	5	22.73	25	1.26	3.15
Chironomidae	Larvae	8	36.36	7	0.35	0.45
Unid. Fish	Undetermined	5	22.73	4	0.20	4.18
Unid. Fish	Postlarvae	1	4.55	2	0.10	2.88
Unid. Fish	Juvenile	1	4.55	1	0.05	0.62
Mottled Sculpin	Juvenile	2	9.09	3	0.15	9.68
Digest. Matter	Undetermined	6	27.27	0	0.0	7.82
Pebbles-Stones	Undetermined	1	4.55	0	0.0	0.02
Sand Grains	Undetermined	5	22.73	0	0.0	0.21

APPENDIX G

WATER QUALITY

Table G-1

WEEKLY TEMPERATURE (° C) PROFILES AT THE 32 METER (100 FT) CONTOUR, NINE MILE POINT VICINITY, APR 1977

Sample Depth (meters)	Week 1 – Apr 6			Week 2 – Apr 11			Week 3 – APR 18			Week 4 – APR 29		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface	1.6	1.6	1.7	3.6	4.1	3.5	2.3	1.9	1.9	2.5	2.2	2.2
1	1.6	1.6	1.7	3.5	4.0	3.2	2.4	2.0	1.9	2.5	2.2	2.2
2	1.6	1.6	1.7	3.4	3.8	3.2	2.4	1.9	1.9	2.4	2.2	2.2
3	1.6	1.6	1.7	3.3	3.8	3.2	2.4	1.9	1.9	2.4	2.2	2.2
4	1.7	1.6	1.7	3.3	3.7	3.2	2.2	2.0	1.9	2.5	2.2	2.2
5	1.7	1.6	1.7	3.3	3.6	3.2	2.2	1.9	2.0	2.5	2.2	2.2
6	1.7	1.6	1.7	3.3	3.6	3.2	2.2	2.0	2.0	2.5	2.2	2.2
7	1.7	1.6	1.7	3.3	3.5	3.2	2.2	2.2	2.3	2.5	2.2	2.2
8	1.7	1.6	1.7	3.2	3.5	3.2	2.2	2.2	2.3	2.5	2.2	2.2
9	1.7	1.6	1.7	3.2	3.5	3.2	2.2	2.2	2.4	2.5	2.2	2.2
10	1.7	1.7	1.8	3.2	3.5	3.2	2.2	2.2	2.4	2.5	2.2	2.2
11	1.7	1.7	1.8	3.2	3.4	3.2	2.2	2.3	2.5	2.5	2.2	2.2
12	1.8	1.7	1.8	3.2	3.4	3.1	2.2	2.3	2.5	2.5	2.2	2.2
13	1.8	1.8	1.8	3.2	3.4	3.1	2.2	2.3	2.5	2.5	2.3	2.2
14	1.8	1.8	1.8	3.2	3.4	3.1	2.2	2.3	2.5	2.5	2.3	2.2
15	1.8	1.8	1.8	3.2	3.4	3.1	2.2	2.3	2.5	2.5	2.3	2.2
16	1.8	1.8	1.9	3.2	3.3	3.1	2.3	2.3	2.5	2.5	2.3	2.2
17	1.8	1.9	1.9	3.2	3.3	3.1	2.3	2.3	2.5	2.5	2.3	2.2
18	1.8	1.9	2.0	3.2	3.3	3.1	2.3	2.3	2.5	2.5	2.3	2.3
19	1.8	1.9	2.0	3.2	3.3	3.1	2.3	2.3	2.5	2.5	2.3	2.3
20	1.8	1.9	2.0	3.1	3.2	3.0	2.3	2.4	2.5	2.6	2.3	2.3
21	1.8	1.9	2.0	3.0	3.2	3.0	2.4	2.4	2.5	2.6	2.3	2.3
22	1.8	1.9	2.1	3.0	3.2	3.0	2.4	2.4	2.5	2.6	2.3	2.3
23	1.8	1.9	2.1	3.0	3.2	3.0	2.5	2.4	2.7	2.6	2.4	2.3
24	1.8	1.9	2.2	3.0	3.2	3.0	2.5	2.4	2.7	2.6	2.4	2.3
25	1.8	1.9	2.2	2.9	3.2	3.0	2.7	2.5	2.7	2.6	2.4	2.3
26	1.8	2.0	2.2	2.9	3.2	3.0	2.8	2.5	2.7	2.6	2.4	2.3
27	1.8	2.0	2.3	2.9	3.2	2.9	2.8	2.5	2.7	2.6	2.5	2.3
28	1.8	2.0	2.3	2.9	3.2	2.9	3.6	2.7	2.7	2.6	2.5	2.4
29		2.1	2.3	2.1	3.1	2.9	4.2	2.7	2.7	2.7	2.5	2.4
30		2.1	2.3	2.5	3.1	2.9		2.7	2.7	2.7	2.5	2.4
31				2.6	3.2	3.1		2.7	2.7			
32				2.8	3.5	3.1		2.8				
33						3.2						

Table G-1 (CONTD)

WEEKLY TEMPERATURE (°C) PROFILES AT THE 32 METER (100 FT) CONTOUR, NINE MILE POINT VICINITY, MAY 1977

Sample Depth (meters)	Week 1 – May 4			Week 2 – May 10			Week 3 – May 19			Week 4 – May 24		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface	3.0	2.9	3.2	3.2	3.4	3.3	5.6	3.9	5.0	6.7	9.9	10.8
1	3.0	2.9	3.2	3.2	3.4	3.3	5.6	3.9	5.0	6.7	9.9	10.8
2	2.9	2.6	3.2	3.3	3.4	3.3	5.4	3.7	4.6	5.3	9.3	10.3
3	2.9	2.6	3.1	3.2	3.3	3.3	5.4	3.7	4.3	4.7	9.4	9.1
4	3.0	2.7	3.1	3.3	3.4	3.3	5.2	3.7	4.2	4.3	8.6	7.7
5	3.0	2.7	3.1	3.2	3.3	3.3	5.1	3.6	4.2	4.3	8.2	7.2
6	3.0	2.7	3.1	3.3	3.3	3.3	5.0	3.6	4.2	4.2	7.9	6.8
7	3.0	2.7	3.1	3.3	3.3	3.2	4.8	3.5	4.2	4.1	7.3	5.9
8	3.0	2.7	3.0	3.3	3.3	3.3	4.8	3.5	4.1	4.1	6.9	5.4
9	2.9	2.9	3.1	3.3	3.3	3.3	4.8	3.5	4.0	4.1	6.4	5.3
10	2.9	3.1	3.0	3.2	3.3	3.3	4.7	3.5	4.1	4.1	6.1	4.7
11	2.9	3.1	3.0	3.2	3.4	3.3	4.7	3.4	4.2	4.1	5.9	4.4
12	2.9	3.3	3.0	3.2	3.4	3.4	4.7	3.5	4.0	3.9	5.7	4.2
13	2.9	3.4	3.0	3.2	3.4	3.4	4.6	3.5	3.7	3.9	5.4	4.2
14	2.9	3.6	3.0	3.3	3.4	3.3	4.5	3.6	4.0	3.9	5.3	4.1
15	2.9	3.6	3.0	3.3	3.4	3.3	4.5	3.7	3.9	3.9	5.2	4.1
16	2.9	3.6	3.0	3.3	3.4	3.4	4.5	3.9	3.9	3.9	5.2	4.1
17	2.9	3.8	3.0	3.4	3.4	3.4	4.5	3.9	3.9	3.9	5.0	4.1
18	3.0	3.8	3.0	3.4	3.4	3.4	4.3	3.9	3.9	3.9	5.0	4.1
19	3.0	3.9	3.0	3.3	3.4	3.4	4.3	4.0	3.9	4.0	5.0	4.1
20	3.0	4.0	3.0	3.3	3.4	3.4	4.2	4.0	3.9	4.0	4.9	4.1
21	3.0	4.0	3.0	3.3	3.4	3.4	4.2	4.0	3.9	4.1	4.9	4.1
22	3.1	4.0	3.1	3.3	3.5	3.4	4.2	4.0	3.4	4.1	4.8	4.0
23	3.1	4.0	3.2	3.4	3.5	3.4	4.2	4.0	3.2	4.1	4.8	4.0
24	3.1	4.1	3.2	3.4	3.6	3.4	4.2	4.0	3.6	4.1	4.7	4.0
25	3.1	4.4	3.4	3.4	4.0	3.4	4.2	4.0	3.6	4.1	4.7	4.0
26	3.2	4.4	3.5	3.4	4.0	3.4	4.2	4.0	3.6	4.1	4.7	4.0
27	3.2	4.5	3.8	3.4	4.0	3.4	4.1	4.1	3.6	4.2	4.7	4.0
28	3.5	4.6	4.0	3.4	4.3	3.4	4.1	4.1	3.6	4.1	4.6	4.0
29	4.0	4.6	4.1	3.4	4.4	3.5	4.1	4.1	3.6	4.1	4.5	4.0
30	4.1	4.6	4.1	3.4	4.4	3.5	4.1	4.1	3.9	4.2	4.4	4.0
31	4.2	4.6	4.2	3.4	4.4	3.6	4.1	4.1	3.9	4.2	4.4	4.0
32							4.1	4.1	3.9	4.1	4.4	4.0

Table G-1 (CONTD)

WEEKLY TEMPERATURE (°C) PROVIDES AT THE 32 METER (100 FT) CONTOUR, NINE MILE POINT VICINITY, JUN 1977

Sample Depth (meters)	Week 1 – Jun 2			Week 2 – Jun 6			Week 3 – Jun 13			Week 4 – Jun 20			Week 5 – Jun 28		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface	6.7	7.1	7.1	10.4	11.4	9.4	10.8	10.8	11.4	13.2	13.4	13.3	16.9	17.0	17.1
1	6.7	7.1	7.1	10.3	10.9	9.3	10.7	10.7	11.3	12.8	13.1	12.9	16.9	17.1	17.1
2	6.7	6.9	7.1	8.7	8.2	9.1	10.5	9.6	10.1	12.2	12.6	12.4	16.9	17.0	17.0
3	6.4	6.8	6.7	8.3	7.9	8.6	9.9	9.1	9.9	11.4	12.5	11.9	16.9	16.9	16.9
4	6.4	6.4	6.6	7.9	7.8	7.8	9.6	9.1	9.9	11.0	12.3	11.6	16.8	16.8	16.8
5	6.2	6.2	6.4	7.6	7.7	7.5	9.2	8.6	9.7	10.6	11.7	11.5	16.8	16.7	16.4
6	6.1	6.1	6.4	7.5	6.9	6.5	9.1	8.3	9.3	10.3	10.9	10.9	16.7	16.3	16.0
7	6.0	6.1	6.4	7.3	6.9	6.4	9.1	8.0	9.1	10.0	10.6	10.1	16.7	15.5	15.8
8	5.9	6.1	6.4	7.1	6.9	6.1	8.9	7.9	9.1	9.7	10.6	10.0	16.4	15.2	15.4
9	5.9	6.0	6.4	6.8	6.7	6.1	8.7	7.8	8.3	9.6	10.5	10.0	16.0	15.2	14.8
10	6.0	5.9	6.3	6.6	6.5	6.1	8.5	7.8	8.7	9.5	10.2	10.0	15.3	15.1	13.9
11	6.0	5.8	6.0	6.6	6.4	5.9	8.5	7.7	8.6	9.4	9.9	10.0	15.2	14.6	13.6
12	5.9	5.5	5.8	6.5	6.4	5.8	8.4	7.6	8.6	9.3	9.0	9.9	15.1	13.4	12.8
13	5.8	5.1	5.5	6.4	6.3	5.8	8.4	7.6	8.5	9.3	8.9	9.5	14.8	12.6	12.0
14	5.7	4.9	4.9	6.4	6.3	5.7	8.4	7.6	8.5	9.3	8.8	9.1	14.0	12.1	11.4
15	5.6	4.8	4.8	6.4	6.3	5.6	8.2	7.5	8.3	9.2	8.7	8.3	13.6	11.9	11.2
16	5.6	4.7	4.7	6.4	6.3	5.6	8.1	7.5	8.1	9.1	8.7	8.5	12.9	11.8	11.1
17	5.6	4.6	4.6	6.4	6.2	5.5	8.0	7.4	7.9	9.1	8.6	8.1	12.5	11.2	11.1
18	5.6	4.6	4.6	6.3	6.2	5.4	7.9	7.5	7.3	9.0	8.5	7.9	12.3	11.1	11.0
19	5.6	4.5	4.4	6.3	6.2	5.4	7.9	7.4	7.7	9.0	8.4	7.9	11.8	11.0	11.0
20	5.6	4.4	4.3	6.3	6.2	5.4	7.9	7.4	7.7	8.9	8.4	7.8	11.3	10.9	10.9
21	5.6	4.4	4.3	6.3	6.1	5.3	7.9	7.4	7.7	8.9	8.3	7.8	11.1	10.7	10.8
22	5.6	4.4	4.2	6.3	6.1	5.3	7.9	7.4	7.6	8.8	8.1	7.8	10.2	10.3	10.7
23	5.4	4.3	4.1	6.3	6.1	5.2	7.9	7.4	7.6	8.8	8.0	7.7	10.0	9.8	10.4
24	5.3	4.2	4.1	6.3	6.1	5.2	7.9	7.4	7.6	8.7	8.0	7.7	9.0	9.4	9.2
25	5.3	4.1	4.1	6.3	6.1	5.2	7.8	7.4	7.6	8.7	8.0	7.6	8.7	9.2	8.9
26	5.3	4.1	4.0	6.3	6.1	5.2	7.8	7.3	7.6	8.7	7.9	7.6	8.5	9.0	8.9
27	5.3	4.1	4.0	6.3	6.1	5.2	7.8	7.3	7.6	8.6	7.9	7.5	8.4	8.7	8.9
28	5.2	4.1	4.1	6.3	6.0	5.1	7.8	7.4	7.6	8.6	7.8	7.5	8.4	8.4	8.6
29	5.1	4.1	4.1	6.3	6.0	5.1	7.8	7.3	7.6	8.6	7.8	7.5	8.0	8.1	8.2
30	5.0	4.1	4.1	6.3	6.0	5.1	7.8	7.4	7.6	8.6	7.7	7.5	7.7	8.0	8.0
31	5.1	4.1	4.1	6.3	6.0	5.1	7.8	7.3	7.6	8.6	7.6	7.5	7.6	7.9	7.2
32	5.1	4.1	4.1	6.3	6.0	5.1	7.8	7.3	7.6	8.5	7.6	7.5	7.4	7.1	7.1

Table G-1 (CONTD)

WEEKLY TEMPERATURE (°C) PROFILES AT THE 32 METER (100 FT) CONTOUR, NINE MILE POINT VICINITY, JUL 1977

Sample Depth (meters)	Week 1 – Jul 10			Week 2 – Jul 12			Week 3 – Jul 24			Week 4 – Jul 27		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface	16.6	16.9	18.6	15.0	17.8	20.0	21.1	22.5	22.2	22.2	22.8	22.5
1	16.6	16.9	18.3	15.0	17.8	20.0	21.1	22.5	22.2	21.9	22.5	22.5
2	16.6	16.7	18.3	13.9	17.5	20.0	21.1	22.5	22.2	21.9	21.9	22.5
3	14.2	13.9	18.1	13.1	17.2	20.0	21.1	22.2	22.2	21.9	21.1	22.5
4	12.8	13.1	16.7	12.8	16.9	19.7	21.1	22.2	22.2	21.7	21.1	22.2
5	11.9	12.2	15.3	12.8	16.4	19.2	20.8	22.2	22.2	21.7	20.8	21.7
6	11.4	11.9	14.4	12.8	15.3	18.9	20.5	21.1	22.2	21.1	20.5	20.5
7	11.4	11.7	14.2	12.5	15.0	18.3	20.5	21.1	22.2	20.8	20.5	20.3
8	11.1	11.7	13.9	12.2	14.7	17.8	20.5	21.1	21.9	20.8	20.3	20.3
9	10.6	10.8	13.3	11.4	14.4	16.9	20.5	20.8	21.9	20.5	20.3	20.3
10	10.6	10.6	12.8	10.6	14.4	16.7	20.5	20.6	21.7	20.5	20.3	20.3
11	10.3	10.6	12.5	10.3	14.4	16.4	20.5	20.6	21.6	20.5	20.3	20.3
12	10.0	10.6	11.4	10.0	14.2	16.1	20.5	20.6	21.6	20.5	20.3	20.3
13	9.7	10.3	11.4	10.0	14.2	15.8	20.4	20.6	21.4	20.5	20.3	20.3
14	9.7	9.7	10.6	10.0	13.9	15.8	20.4	20.6	21.4	20.5	20.3	20.3
15	8.9	9.4	10.0	9.7	13.9	15.8	20.3	20.3	21.4	20.5	20.3	20.0
16	8.6	9.2	9.7	9.7	13.6	15.8	18.9	20.0	21.1	20.3	20.3	20.0
17	8.3	8.6	9.7	9.4	13.6	15.2	18.3	20.0	21.1	20.3	20.3	20.0
18	8.1	8.3	9.7	8.9	13.3	15.0	18.2	19.4	21.1	20.3	20.3	19.7
19	7.2	8.1	9.4	8.6	13.3	14.4	17.2	19.4	21.1	20.0	20.0	19.7
20	6.4	7.8	8.9	8.6	12.8	14.2	15.5	19.2	21.0	20.0	20.0	19.7
21	6.1	7.8	8.3	8.1	12.2	14.2	14.7	19.2	19.4	20.0	20.0	19.7
22	6.1	7.3	7.8	7.8	11.9	14.2	13.9	19.2	19.4	20.0	20.0	19.7
23	6.1	7.2	7.5	7.5	11.7	13.9	13.1	18.3	19.3	20.0	19.7	19.7
24	5.8	6.7	6.9	7.5	11.7	13.6	10.0	18.3	19.2	20.0	19.7	19.7
25	5.8	6.4	6.4	7.5	11.4	13.6	9.4	18.2	19.2	20.0	19.7	19.7
26	5.7	6.1	6.1	7.2	11.4	13.3	8.9	18.1	19.1	20.0	19.7	19.7
27	5.6	5.8	5.7	6.7	11.1	13.3	8.6	17.8	18.9	20.0	19.7	19.7
28	5.6	5.6	5.6	6.1	11.1	13.1	8.6	17.5	18.9	20.0	19.7	19.7
29	5.6	5.1	5.6	4.7	11.1	12.8	8.3	16.9	18.8	20.0	19.7	19.7
30	5.6	5.0	5.6	4.4	11.1	12.5	7.8	16.1	18.6	20.0	19.4	19.7
31	5.3	5.0	5.3	4.2	10.8	12.2			18.3	19.7	19.4	19.4
32										19.7	19.7	19.7

Table G-1 (CONTD)

WEEKLY TEMPERATURE (°C) PROFILES AT THE 32 METER (100 FT) CONTOUR, NINE MILE POINT VICINITY, AUG 1977

Sample Depth (meters)	Week 1 – Aug 3			Week 2 – Aug 9			Week 3 – Aug 16			Week 4 – Aug 24			Week 5 – Aug 31		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface	20.8	21.1	20.8	22.2	22.2	22.8	22.1	22.2	22.8	20.6	20.4	20.3	20.0	20.5	21.2
1	20.8	21.1	20.8	21.9	22.2	22.8	22.1	21.9	22.8	20.6	20.4	20.3	19.4	20.5	21.2
2	20.8	21.1	20.8	21.9	21.9	21.9	21.9	21.9	22.8	20.6	20.4	20.3	19.4	20.5	21.2
3	20.5	21.1	20.5	21.6	21.9	21.6	21.9	21.9	22.8	20.6	20.4	20.3	19.4	20.5	21.2
4	20.5	21.1	20.5	21.4	21.9	21.6	21.9	21.9	22.8	20.6	20.4	20.3	18.9	20.5	21.2
5	20.5	20.8	20.5	21.4	21.6	21.6	21.9	21.9	22.5	20.6	20.4	20.3	18.9	20.5	20.5
6	20.5	20.8	20.3	21.4	21.6	21.6	21.9	21.9	22.5	20.6	20.4	20.3	18.9	20.5	20.0
7	20.5	20.8	20.3	21.4	21.6	21.6	21.9	21.9	22.5	20.6	20.4	20.2	18.8	20.0	20.0
8	20.3	20.5	20.3	21.4	21.6	21.6	21.9	21.9	22.5	20.6	20.4	20.2	18.9	20.0	19.9
9	20.0	20.5	20.0	21.4	21.6	21.6	21.9	21.9	22.5	20.6	20.4	20.2	18.9	20.0	19.4
10	20.3	20.3	20.0	21.4	21.6	21.6	21.9	21.9	22.5	20.6	20.4	20.2	18.3	20.0	19.4
11	20.0	20.3	19.7	21.4	21.6	21.6	21.9	21.9	22.5	20.6	20.4	20.2	17.7	19.9	19.4
12	20.0	20.3	19.7	21.4	21.6	21.6	21.9	21.9	22.5	20.6	20.4	20.2	17.7	19.7	18.9
13	20.0	20.0	19.4	21.4	21.4	21.4	21.9	21.9	22.5	20.6	20.3	20.2	17.7	19.5	18.9
14	19.7	20.0	19.4	21.4	21.4	21.4	21.9	21.9	22.5	20.6	20.3	20.2	17.3	19.4	18.9
15	19.7	20.0	19.4	21.4	12.4	21.4	21.9	21.9	22.5	20.6	20.3	20.2	17.3	19.4	18.9
16	19.4	20.0	19.4	21.4	21.4	21.4	21.8	21.9	22.5	20.6	20.3	20.2	17.3	19.3	18.9
17	19.4	19.7	19.4	21.1	21.4	21.4	21.8	21.9	22.5	20.6	20.3	20.2	17.2	19.2	18.9
18	19.4	19.7	19.4	20.5	21.1	21.1	21.8	21.9	22.5	20.6	20.0	20.2	17.2	19.0	18.6
19	19.4	19.7	19.4	20.0	21.1	21.1	21.7	21.7	22.2	20.6	20.0	20.2	17.2	18.9	18.3
20	19.4	19.7	19.4	10.0	19.4	20.8	21.7	21.7	22.2	20.6	20.0	20.0	17.2	18.9	18.3
21	19.4	19.7	19.2	8.9	18.6	18.9	21.7	21.7	22.2	20.5	20.0	20.0	16.7	18.9	18.2
22	19.4	19.4	19.2	6.9	13.0	11.9	21.7	21.7	22.2	20.5	20.0	20.0	16.7	18.9	17.2
23	19.4	19.4	19.2	6.7	8.6	10.0	21.7	21.7	22.2	20.5	20.0	19.9	16.1	15.0	17.2
24	19.2	19.4	19.2	6.7	6.9	8.9	21.7	21.7	22.2	20.5	20.0	19.9	14.4	9.4	10.4
25	19.2	19.4	19.2	6.7	6.9	8.3	21.7	21.7	22.2	20.4	20.0	19.7	10.5	8.4	7.5
26	19.2	19.4	18.9	6.7	6.9	8.3	21.7	21.7	22.2	20.3	20.0	19.5	8.0	7.8	6.7
27	19.2	15.0	18.9	6.7	6.9	8.3	21.4	21.7	22.2	20.0	20.0	19.4	6.9	7.8	6.7
28	19.2	12.2	12.5	6.7	6.9	8.3	21.4	21.7	22.2	20.0	20.0	19.4	5.5	7.4	5.6
29	8.9	11.7	10.6	6.1	6.9		21.1	21.7	22.2	20.0	20.0	19.0	5.0	7.2	5.6
30	7.8	11.1	9.2				21.1	21.7	21.7	20.0	20.0	19.0	5.0	6.7	5.0
31	7.5	9.7	8.3				21.1	21.7	21.4	20.0	18.9	19.0	5.0	6.7	4.8
32	7.2	9.4	8.1							18.6	18.9	19.0	5.0	6.2	4.7

Table G-1 (CONTD)

WEEKLY TEMPERATURE (°C) PROFILES AT THE 32-METER (100-FT) CONTOUR, NINE MILE POINT VICINITY, SEP 1977

Sample Depth (meters)	Week 1 – Sep 7			Week 2 – Sep 12			Week 3 – Sep 19			Week 4 – Sep 30		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface				19.1	19.4	19.3	18.9	18.9	18.7	13.9	13.4	13.5
1	22.2	23.3	22.5	19.1	19.4	19.2	18.9	18.7	18.6	13.9	13.4	13.5
2	22.2	22.8	22.5	19.0	19.3	19.2	18.7	18.5	18.4	13.9	13.4	13.5
3	21.7	22.2	22.2	18.9	19.3	19.2	18.6	18.4	18.4	13.9	13.4	13.5
4	21.1	22.2	22.2	18.8	18.9	19.1	18.5	18.4	18.4	13.9	13.4	13.5
5	21.1	22.2	22.2	18.8	18.9	19.0	18.5	18.4	18.4	13.9	13.4	13.5
6	21.1	22.2	22.2	18.8	18.8	19.0	18.4	18.4	18.4	13.9	13.4	13.5
7	21.1	21.7	21.7	18.8	18.8	19.0	18.4	18.3	18.3	13.9	13.4	13.5
8	21.1	20.6	21.1	18.8	18.8	18.9	18.4	18.3	18.3	13.9	13.4	13.4
9	21.1	20.3	20.8	18.8	18.8	18.9	18.4	18.3	18.3	13.9	13.4	13.4
10	21.1	20.0	20.6	18.8	18.8	18.9	18.4	18.3	18.2	13.9	13.4	13.4
11	20.6	20.0	20.3	18.8	18.8	18.9	18.3	18.1	18.2	13.9	13.4	13.4
12	20.6	20.0	20.0	18.8	18.8	18.9	18.3	18.1	18.2	13.9	13.4	13.4
13	20.6	19.4	19.7	18.8	18.8	18.9	18.2	18.1	18.1	13.9	13.4	13.4
14	20.3	19.4	19.4	18.8	18.8	18.9	18.2	18.0	18.1	13.9	13.4	13.4
15	20.0	19.2	19.2	18.7	18.8	18.9	18.0	18.0	18.1	13.8	13.4	13.4
16	19.7	18.9	18.6	18.7	18.8	18.9	18.0	17.9	18.0	13.8	13.4	13.4
17	19.4	18.9	18.3	18.7	18.8	18.9	17.9	17.8	17.9	13.8	13.4	13.4
18	19.4	18.3	18.1	18.7	18.8	18.9	17.7	17.8	17.8	13.8	13.4	13.3
19	19.4	18.3	17.8	18.7	18.8	18.8	16.5	17.7	17.7	13.8	13.4	13.3
20	19.4	18.3	17.8	18.7	18.8	18.8	15.4	17.5	17.5	13.8	13.4	13.3
21	18.9	18.1	16.7	18.7	18.8	18.8	14.6	16.5	17.3	13.8	13.4	13.3
22	18.3	17.8	15.8	18.7	18.8	18.8	13.2	12.8	17.1	13.8	13.4	13.2
23	18.3	17.2	13.9	18.7	18.8	18.8	12.5	12.3	16.1	13.8	13.3	13.2
24	17.8	15.6	11.7	18.6	18.7	18.8	12.2	12.1	13.7	13.8	13.3	13.2
25	17.2	13.3	10.6	18.6	18.7	18.8	10.8	10.4	12.2	13.8	13.3	13.2
26	17.2	12.2	8.3	18.6	18.7	18.8	10.3	8.3	11.2	13.7	13.3	13.2
27	16.7	11.7	8.1	18.6	18.7	18.8	10.2	6.3	10.0	13.7	13.3	13.2
28	15.6	11.1	7.8	18.5	18.7	18.7	9.8	5.9	6.7	13.6	13.3	13.2
29	15.0	8.9	7.8	18.4	18.7	18.4	8.5	5.9	6.6	13.4	13.3	13.2
30	14.4	8.3	7.8	18.4	18.7	18.4	8.5	5.9	6.6	13.5	13.3	13.2
31				18.4	18.7	18.3						
32												

Table G-1 (CONTD)

WEEKLY TEMPERATURE (°C) PROFILES AT THE 32-METER (100-FT) CONTOUR, NINE MILE POINT VICINITY, OCT 1977

Sample Depth (meters)	Week 1 – Oct 7			Week 2 – Oct 11			Week 3 – Oct 18			Week 4 – Oct 24		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface	14.1	14.0	14.1	12.9	13.2	12.9	11.6	11.6	11.6	11.4	11.9	11.7
1	14.1	14.0	14.0	12.9	13.2	12.9	11.6	11.6	11.6	11.4	11.9	11.6
2	14.1	14.0	14.0	12.9	13.2	12.9	11.6	11.6	11.6	11.4	11.8	11.5
3	14.1	14.0	14.0	12.9	13.1	12.9	11.6	11.6	11.6	11.4	11.7	11.4
4	14.1	14.0	14.0	12.9	13.1	12.9	11.6	11.6	11.6	11.4	11.7	11.3
5	14.0	13.9	13.9	12.9	13.1	12.9	11.6	11.6	11.6	11.4	11.7	11.3
6	14.0	13.9	13.9	12.9	13.1	12.9	11.6	11.6	11.6	11.4	11.5	11.3
7	14.0	13.9	13.9	12.9	13.1	12.9	11.6	11.6	11.6	11.4	11.4	11.3
8	14.0	13.9	13.9	12.9	13.1	12.9	11.6	11.6	11.6	11.3	11.4	11.3
9	14.0	13.9	13.9	12.9	13.0	12.9	11.6	11.6	11.6	11.3	11.4	11.3
10	14.0	13.9	13.9	12.8	13.0	12.9	11.6	11.6	11.6	11.3	11.3	11.2
11	13.9	13.9	13.9	12.8	13.0	12.9	11.6	11.6	11.6	11.2	11.3	11.2
12	13.9	13.9	13.8	12.8	13.0	12.9	11.6	11.6	11.6	11.2	11.3	11.2
13	13.9	13.9	13.8	12.9	13.0	12.9	11.6	11.5	11.6	11.2	11.2	11.2
14	13.9	13.9	13.8	12.9	13.0	12.9	11.6	11.5	11.6	11.2	11.2	11.2
15	13.9	13.8	13.8	12.9	13.0	12.9	11.6	11.5	11.6	11.2	11.2	11.2
16	13.9	13.8	13.8	12.9	13.0	12.9	11.6	11.5	11.6	11.2	11.2	11.2
17	13.9	13.8	13.7	12.9	13.0	12.9	11.6	11.5	11.6	11.2	11.2	11.2
18	13.9	13.7	13.7	12.9	13.0	12.9	11.6	11.5	11.5	11.2	11.2	11.2
19	13.9	13.7	13.7	12.8	12.9	12.9	11.5	11.5	11.5	11.2	11.2	11.2
20	13.9	13.7	13.6	12.8	12.9	12.9	11.5	11.5	11.5	11.2	11.2	11.2
21	13.9	13.7	13.6	12.8	12.9	1.29	11.5	11.5	11.5	11.2	11.2	11.2
22	13.9	13.6	13.6	12.8	12.9	12.9	11.5	11.5	11.5	11.2	11.2	11.2
23	13.9	13.6	13.6	12.8	12.9	12.9	11.5	11.4	11.5	11.2	11.2	11.2
24	13.9	13.6	13.6	12.8	12.9	12.9	11.5	11.4	11.5	11.2	11.2	11.2
25	13.9	13.5	13.6	12.8	12.9	12.9	11.5	11.4	11.5	11.2	11.2	11.2
26	13.9	13.5	13.6	12.8	12.9	12.9	11.5	11.4	11.5	11.1	11.2	11.2
27	13.9	13.5	13.5	12.8	12.9	12.9	11.5	11.4	11.5	11.1	11.2	11.2
28	13.9	13.5	13.5	12.7	12.9	12.9	11.5	11.4	11.5	11.0	11.2	11.2
29	13.9	13.5	13.5	12.6	12.9	12.9	11.5	11.4	11.5	11.0	11.1	11.1
30	13.9	13.5	13.5	12.6	12.9	12.9	11.5	11.4	11.5	11.0	11.1	11.1
31				12.5	12.9	12.9	11.5	11.4	11.5	10.9	11.1	11.1
32							11.5	11.4	11.5	10.9	11.2	11.1
33							11.5	11.4	11.5			
34							11.5	11.4	11.5			
35							11.5	11.4	11.5			

Table G-1 (CONTD)

WEEKLY TEMPERATURE (°C) PROFILES AT THE 32-METER (100-FT) CONTOUR, NINE MILE POINT VICINITY, NOV 1977

Sample Depth (meters)	Week 1 – Oct 31			Week 2 – Nov 7			Week 3 – Nov 15			Week 4 – Nov 23			Week 5 – Nov 30		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface	11.2	11.0	11.0	11.4	11.0	11.1	7.3	7.8	8.1	7.8	7.8	7.8	6.5	6.8	6.5
1	11.2	11.0	11.1	11.3	11.0	11.1	7.3	7.8	8.1	7.8	7.8	7.8	6.6	6.8	6.6
2	11.2	11.0	11.1	11.3	11.0	11.1	7.3	7.8	8.1	7.8	7.8	7.8	6.6	6.8	6.6
3	11.2	11.0	11.1	11.2	11.0	11.1	7.3	7.8	8.0	7.8	7.8	7.8	6.6	6.8	6.6
4	11.2	11.0	11.1	11.2	10.9	11.1	7.3	7.8	7.9	7.8	7.8	7.9	6.6	6.8	6.6
5	11.2	11.0	11.1	11.1	10.9	11.1	7.3	7.8	7.9	7.8	7.8	7.9	6.6	6.8	6.6
6	11.2	11.0	11.1	11.0	10.9	10.9	7.3	7.6	7.9	7.8	7.8	7.8	6.6	6.8	6.6
7	11.1	11.0	11.0	11.0	10.8	10.9	7.3	7.6	7.9	7.8	7.8	7.8	6.6	6.7	6.6
8	11.1	11.0	11.0	10.9	10.8	10.9	7.3	7.6	7.9	7.8	7.8	7.8	6.6	6.7	6.6
9	11.0	11.0	11.0	10.9	10.8	10.8	7.3	7.4	7.7	7.8	7.8	7.8	6.6	6.7	6.6
10	11.0	11.0	11.0	10.8	10.8	10.8	7.3	7.4	7.7	7.8	7.8	7.8	6.6	6.6	6.6
11	11.0	11.0	11.0	10.8	10.8	10.8	7.3	7.3	7.5	7.8	7.8	7.8	6.6	6.6	6.6
12	11.0	11.0	11.0	10.8	10.8	10.8	7.3	7.3	7.4	7.8	7.8	7.8	6.6	6.6	6.6
13	11.0	11.0	11.0	10.8	10.8	10.8	7.3	7.3	7.4	7.8	7.8	7.8	6.6	6.5	6.6
14	11.0	11.0	11.0	10.8	10.8	10.8	7.3	7.3	7.3	7.8	7.8	7.8	6.6	6.4	6.6
15	11.0	11.0	11.0	10.8	10.8	10.8	7.3	7.3	7.3	7.8	7.8	7.8	6.6	6.3	6.6
16	11.0	11.0	11.0	10.7	10.8	10.8	7.3	7.3	7.3	7.8	7.8	7.8	6.6	6.3	6.6
17	11.0	11.0	11.0	10.4	10.8	10.8	7.3	7.3	7.3	7.8	7.8	7.8	6.6	6.3	6.6
18	10.6	11.0	11.0	8.9	10.8	10.8	7.3	7.2	7.3	7.8	7.8	7.8	6.6	6.3	6.6
19	10.4	11.0	11.0	8.4	10.7	10.8	7.3	7.2	7.3	7.8	7.8	7.8	6.6	6.3	6.6
20	9.5	11.0	11.0	7.8	10.2	10.8	7.3	7.2	7.3	7.8	7.8	7.8	6.6	6.2	6.6
21	8.7	11.0	11.0	7.4	7.6	10.1	7.3	7.2	7.3	7.8	7.8	7.8	6.6	6.2	6.6
22	8.1	11.0	11.0	7.1	7.1	7.4	7.3	7.2	7.3	7.8	7.8	7.8	6.6	6.2	6.6
23	7.5	11.0	11.0	6.7	5.2	6.1	7.3	7.2	7.3	7.8	7.8	7.8	6.6	6.2	6.6
24	7.2	11.0	11.0	6.4	5.1	5.2	7.3	7.2	7.3	7.8	7.8	7.8	6.6	6.2	6.5
25	6.8	11.0	11.0	6.1	5.0	4.8	7.3	7.2	7.3	7.8	7.8	7.9	6.5	6.2	6.5
26	5.8	11.0	11.0	5.7	4.7	4.7	7.2	7.2	7.3	7.8	7.8	7.8	6.5	6.2	6.5
27	5.0	11.0	11.0	5.5	4.6	4.6	7.2	7.2	7.3	7.8	7.8	7.8	6.5	6.2	6.5
28	4.9	11.0	11.0	5.4	4.5	4.5	7.2	7.2	7.2	7.8	7.8	7.8	6.5	6.2	6.5
29	4.8	10.9	11.0	5.3	4.3	4.5	7.2	7.2	7.2	7.8	7.8	7.8	6.5	6.2	6.5
30	4.7	10.8	10.9	5.2	4.3	4.5	7.2	7.2	7.2	7.8	7.8	7.8	6.4	6.2	6.5
31	4.5	8.2	10.0	5.0		4.6							6.3	6.2	6.5
32													6.3	6.2	6.4
33													5.8	6.2	6.0

Table G-1 (CONTD)

WEEKLY TEMPERATURE (°C) PROFILES AT THE 32-METER (100-FT) CONTOUR, NINE MILE POINT VICINITY, DEC 1977

Sample Depth (meters)	Week 1 — Dec 8			Week 2 — Dec 13			Week 3 — Dec 20			Week 4 —		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Surface	5.2	5.2	5.5	3.1	3.7	2.8	3.2	2.1	3.0	No temperatures obtained due to winter weather		
1	5.3	5.2	5.5	3.1	3.8	2.8	3.2	2.1	3.0			
2	5.3	5.2	5.6	3.1	3.8	2.8	3.2	2.1	3.0			
3	5.3	5.2	5.6	3.1	3.8	2.8	3.2	2.1	3.0			
4	5.3	5.2	5.6	3.1	3.8	2.9	3.2	2.1	3.0			
5	5.3	5.2	5.6	3.1	3.8	2.9	3.2	2.1	3.0			
6	5.3	5.2	5.6	3.1	3.8	2.9	3.2	2.1	3.0			
7	5.3	5.2	5.6	3.1	3.8	2.9	3.2	2.1	3.0			
8	5.3	5.3	5.6	3.1	3.8	2.9	3.2	2.1	3.0			
9	5.3	5.3	5.6	3.1	3.8	2.9	3.2	2.1	3.0			
10	5.3	5.3	5.6	3.1	3.8	2.9	3.2	2.1	3.0			
11	5.3	5.3	5.6	3.1	3.8	2.8	3.2	2.1	3.0			
12	5.2	5.3	5.6	3.1	3.7	2.9	3.2	2.1	3.0			
13	5.2	5.3	5.5	3.1	3.6	2.9	3.2	2.1	3.0			
14	5.2	5.2	5.4	3.1	3.6	2.9	3.2	2.1	3.0			
15	5.2	5.2	5.3	3.1	3.6	2.9	3.2	2.1	3.0			
16	5.1	5.2	5.3	3.1	3.7	2.9	3.2	2.1	3.0			
17	5.1	5.2	5.2	3.1	3.6	2.9	3.2	2.2	3.0			
18	4.6	5.1	5.2	3.1	3.6	2.9	3.2	2.3	3.0			
19	4.6	5.1	5.1	3.1	3.7	2.8	3.2	2.4	3.0			
20	4.4	5.0	5.1	3.1	3.7	2.9	3.2	2.4	3.0			
21	4.3	4.9	5.0	3.1	3.6	2.8	3.2	2.4	3.0			
22	4.2	4.8	4.8	3.1	3.5	2.9	3.2	2.5	3.0			
23	4.2	4.5	4.7	3.1	3.5	2.9	3.2	2.5	3.0			
24	4.2	4.4	4.7	3.1	3.6	2.9	3.2	2.6	3.0			
25	4.2	4.3	4.6	3.1	3.6	2.9	3.2	2.6	3.0			
26	4.1	4.2	4.5	3.1	3.5	2.9	3.2	2.7	3.0			
27	4.1	4.2	4.5	3.1	3.5	2.9	3.2	2.7	3.0			
28	3.8	4.1	4.5	3.1	3.5	2.9	3.2	2.7	3.0			
29	3.6	4.1	4.4	3.1	3.5	2.9	3.3	2.8	3.0			
30	3.5	4.1	4.4	3.1	3.5	2.9	3.3	2.8	3.0			

Table G-2

MONTHLY WATER QUALITY PARAMETERS FROM SURFACE SAMPLES AT THE 20- AND 40-FOOT CONTOURS IN THE VICINITY OF NINE MILE POINT AND JAMES A. FITZPATRIC POWER PLANTS, 1977

	20-Ft Contour			40-Ft Contour		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
DO (mg/l)						
29 Apr	14.1	13.8	13.5	11.3	11.2	12.0
10 May	9.8	11.0	14.2	8.9	10.7	13.5
6 Jun	11.6	NS	11.6	11.2	11.3	11.4
18 Jul	11.6	10.7	11.2	10.8	10.9	11.1
16 Aug	9.5	9.0	9.1	9.5	9.3	9.5
19 Sep	9.0	9.1	9.5	9.1	9.7	9.7
18 Oct	10.1	10.1	10.4	10.2	9.9	10.4
11 Nov	10.1	10.2	10.4	10.4	10.4	10.5
13 Dec	12.0	12.2	13.0	12.4	12.2	13.0
Water Temperature (C^o)						
29 Apr	2.5	2.5	3.5	2.5	2.5	2.5
10 May	6.0	4.3	3.6	5.2	5.0	3.6
6 Jun	13.1	11.5	10.5	12.3	11.3	11.0
18 Jul	25.0	22.0	20.0	22.0	21.0	21.0
16 Aug	26.0	25.0	22.5	26.0	25.5	26.0
19 Sep	22.1	21.0	20.1	22.3	19.2	18.8
18 Oct	12.5	13.0	12.5	13.0	15.0	12.0
11 Nov	11.3	11.2	11.3	11.5	13.0	11.4
13 Dec	2.1	3.4	1.8	2.1	3.6	2.2
pH (Units)						
29 Apr	8.1	8.2	8.1	8.1	8.1	8.1
10 May	8.1	8.0	8.0	8.0	8.1	8.0
6 Jun	8.2	8.0	8.0	8.2	7.9	8.1
18 Jul	8.4	8.4	8.6	8.6	8.5	8.5
16 Aug	8.8	9.1	9.4	9.0	9.2	9.5
19 Sep	8.1	8.5	8.1	8.4	8.7	8.3
18 Oct	8.3	8.3	8.4	8.3	8.2	8.3
11 Nov	8.3	8.3	8.4	8.4	8.3	8.3
13 Dec	8.2	8.3	8.3	8.2	8.3	8.3

	20-Ft Contour			40-Ft Contour		
	NMPW	FITZ	NMPE	NMPW	FITZ	NMPE
Total Solids (mg/l)						
29 Apr	217	327	277	234	226	264
10 May	261	305	395	488	265	244
6 Jun	393	389	190	388	341	176
18 Jul	320	246	265	339	254	201
16 Aug	227	285	258	236	216	271
19 Sep	240	245	228	239	218	207
18 Oct	246	261	239	257	226	169
11 Nov	208	249	209	157	192	245
13 Dec	197	179	206	221	194	201
TSS (mg/l)						
29 Apr	2.4	1.6	2.4	3.0	1.4	1.2
10 May	1.4	2.0	0.2	0.2	1.0	<0.1
6 Jun	2.6	1.5	<0.1	0.7	<0.1	<0.1
18 Jul	2.8	0.8	1.8	2.5	2.3	3.0
16 Aug	1.5	1.7	1.2	1.7	1.2	1.8
19 Sep	2.6	8.0	0.6	1.8	0.8	0.4
18 Oct	1.6	1.8	2.2	0.4	1.6	1.0
11 Nov	0.8	1.2	6.4	2.4	1.0	1.0
13 Dec	3.8	2.4	1.8	3.2	3.2	3.0
Total Phos. (mg/l-P)						
29 Apr	0.014	0.013	0.017	0.015	0.015	0.025
10 May	0.018	0.018	0.018	0.017	0.025	0.021
6 Jun	0.032	0.031	0.022	0.029	0.021	0.019
18 Jul	0.047	0.023	0.025	0.043	0.030	0.030
16 Aug	0.022	0.029	0.036	0.023	0.021	0.032
19 Sep	0.061	0.039	0.018	0.022	0.014	0.014
18 Oct	0.021	0.019	0.017	0.017	0.023	0.020
11 Nov	0.008	0.011	0.012	0.011	0.018	0.011
13 Dec	0.020	0.017	0.016	0.029	0.024	0.024

NS = Not sampled, collection missed technician error

Table G-2 (CONTD)

	20-Ft Contour NMPW	20-Ft Contour FITZ	20-Ft Contour NMPE	40-Ft Contour NMPW	40-Ft Contour FITZ	40-Ft Contour NMPE
Calcium (mg/l-Ca)						
29 Apr	48.1	45.1	45.7	49.4	45.7	46.3
10 May	47.5	44.5	46.3	48.3	44.5	46.4
6 Jun	52.2	43.1	38.2	48.1	39.6	38.2
18 Jul	59.2	48.3	48.3	58.0	52.8	51.5
16 Aug	37.4	45.8	45.8	42.6	43.8	47.7
19 Sep	42.0	42.0	43.2	43.2	43.8	42.0
18 Oct	33.9	35.5	32.1	37.5	37.7	32.1
11 Nov	28.2	26.9	27.5	28.2	27.5	27.3
13 Dec	30.9	30.9	30.2	31.6	30.9	32.9
Sodium (mg/l-Na)						
29 Apr	11.9	17.0	14.4	11.6	11.6	12.1
10 May	15.9	15.8	34.3	39.4	16.1	18.1
6 Jun	45.5	33.4	30.7	44.1	29.4	28.7
18 Jul	22.2	16.0	16.3	19.0	17.0	16.5
16 Aug	10.8	12.8	12.1	10.8	9.9	14.8
19 Sep	12.2	12.2	11.8	12.0	11.4	11.8
18 Oct	13.8	14.2	10.9	13.4	15.1	10.9
11 Nov	12.9	12.5	12.7	12.7	12.6	12.6
13 Dec	19.0	14.5	13.9	16.3	14.2	14.5
Chromium (mg/l-Cr)						
29 Apr	0.001	<0.001	0.001	<0.001	<0.001	0.002
10 May	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
6 Jun	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
18 Jul	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
16 Aug	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
19 Sep	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
18 Oct	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
11 Nov	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
13 Dec	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfate (mg/l-SO_4)						
29 Apr	27.9	28.3	29.2	28.0	27.7	28.8
10 May	29.6	28.5	35.0	39.0	28.0	28.2
6 Jun	37.0	32.9	31.7	35.8	32.1	31.1
18 Jul	42.6	33.9	34.0	42.5	36.6	35.5
16 Aug	30.8	34.0	34.9	31.7	30.8	34.5
19 Sep	26.7	26.7	26.8	27.0	27.0	27.2
18 Oct	25.0	25.4	22.9	24.0	25.2	21.5
11 Nov	36.2	36.9	36.9	36.5	36.9	36.9
13 Dec	27.4	26.6	26.2	27.8	26.8	27.0

	20-Ft Contour NMPW	20-Ft Contour FITZ	20-Ft Contour NMPE	40-Ft Contour NMPW	40-Ft Contour FITZ	40-Ft Contour NMPE
Gross Alpha (pCi/l)						
29 Apr	<1.08	<1.08	<1.10	<1.06	<1.05	<1.05
10 May	<1.23	1.55	<1.01	<1.01	<0.94	<0.98
6 Jun	<1.31	<1.16	<1.06	<1.27	<1.01	<1.06
18 Jul	<1.64	<1.47	<1.49	<1.64	<1.51	<1.51
16 Aug	<0.71	<0.76	<0.78	<0.71	<1.01	<0.82
19 Sep	<1.46	<1.44	<1.43	<1.46	<1.46	<1.49
18 Oct	<1.08	<1.10	<1.02	<1.04	<1.13	<1.02
11 Nov	<1.50	<1.50	<1.50	<1.50	<1.50	<1.50
13 Dec	<1.57	<1.53	<1.51	<1.57	<1.51	<1.53
Gross Beta (pCi/l)						
29 Apr	2.62	<2.50	<2.50	3.72	2.62	<2.50
10 May	3.65	5.99	4.17	4.25	4.60	3.91
6 Jun	3.54	4.41	4.93	4.15	5.36	3.46
18 Jul	3.43	3.98	3.21	3.21	3.21	4.65
16 Aug	4.69	3.52	5.51	2.58	3.52	5.16
19 Sep	5.77	3.18	3.01	2.68	2.59	4.68
18 Oct	3.75	4.75	4.25	2.84	4.17	4.92
11 Nov	2.19	2.83	4.20	3.10	3.01	3.01
13 Dec	5.57	4.71	2.88	3.94	3.75	3.75
Gamma Spectroscopy (pCi/l)						
29 Apr	Below detection limits			Below detection limits		
10 May	Below detection limits			Below detection limits		
6 Jun	Below detection limits			Below detection limits		
18 Jul	Below detection limits			Below detection limits.		
16 Aug	Below detection limits			Below detection limits		
19 Sep	Below detection limits			Below detection limits		
18 Oct	Below detection limits			Below detection limits		
11 Nov	Below detection limits			Below detection limits		
13 Dec	Below detection limits			Below detection limits		
Tritium (pCi/Liter)						
29 Apr	410	311	297	321	298	265
10 May	<200	<200	<200	<200	<200	<200
6 Jun	222	<200	272	272	<200	<200
18 Jul	<200	347	209	233	211	321
16 Aug	381	415	415	212	480	393
19 Sep	322	460	<200	195	491	<200
18 Oct	440	279	363	376	440	291
11 Nov	134	217	231	216	306	412
13 Dec	200	<200	<200	264	216	205

Table G-3

TWICE MONTHLY WATER QUALITY PARAMETERS FROM SURFACE SAMPLES AT THE 20- AND 60-FT CONTOURS IN THE VICINITY OF NINE MILE POINT AND JAMES A FITZPATRICK POWER PLANTS, 1977

	20-Ft Contour			60-Ft Contour		
	NMPW	NMPP	NMPE	NMPW	NMPP	NMPE
DO (mg/l)						
5 Apr	15.4	15.4	15.4	15.4	15.4	15.4
19 Apr	12.7	12.4	13.8	12.0	12.4	12.4
3 May	6.9	11.6	12.1	13.4	13.6	14.4
17 May	14.1	14.2	11.9	14.4	14.2	13.9
6 Jun	11.6	11.2	11.6	10.6	11.0	11.4
22 Jun	10.8	10.8	11.6	10.7	10.9	11.8
12 Jul	11.6	11.2	10.9	10.8	11.1	9.8
28 Jul	9.7	8.9	9.4	9.6	8.9	9.3
9 Aug	MS	MS	MS	MS	MS	MS
30 Aug	9.9	10.3	10.4	10.2	10.2	10.1
12 Sep	9.4	9.8	9.6	9.5	9.8	9.9
29 Sep	10.7	10.4	10.8	11.3	11.0	10.9
11 Oct	10.5	9.7	10.2	10.1	9.8	10.0
24 Oct	10.3	10.5	10.9	10.2	10.5	10.4
31 Oct	10.8	10.8	11.2	10.8	10.8	10.6
15 Nov	11.2	11.2	11.4	11.0	11.0	11.1
7 Dec	NS	NS	NS	NS	NS	NS
Dec	12.0	12.2	13.1	12.6	12.3	12.7
Water Temperature (C°)						
5 Apr	2.2	3.3	2.6	1.9	3.3	1.6
19 Apr	2.6	2.6	3.1	3.3	2.6	2.7
3 May	10.1	10.5	10.0	10.0	9.5	NT
17 May	10.0	10.0	8.5	9.0	10.0	9.5
6 Jun	13.1	11.2	10.5	12.3	11.1	11.3
22 Jun	15.0	13.9	15.0	14.5	13.2	15.0
12 Jul	17.0	16.0	14.5	16.5	16.5	16.2
28 Jul	23.5	26.0	23.5	22.7	24.0	23.0
9 Aug	24.0	28.0	22.5	24.0	25.0	24.0
30 Aug	26.5	30.0	24.0	27.0	24.0	23.8
12 Sep	18.9	22.3	19.2	19.0	21.1	19.2
29 Sep	12.9	18.0	12.0	12.5	12.0	11.5
11 Oct	12.2	14.0	12.2	12.5	13.0	12.2
24 Oct	11.1	11.2	11.2	11.3	11.5	11.4
31 Oct	11.1	14.5	10.9	11.9	11.4	11.1
15 Nov	7.3	9.8	7.7	7.4	8.5	8.1
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	2.2	6.1	1.8	2.1	3.7	2.3
pH (Units)						
5 Apr	7.7	7.9	7.8	7.8	7.8	7.8
19 Apr	7.8	7.9	7.9	7.8	7.8	7.8
3 May	7.9	8.0	7.9	8.1	8.1	7.9
17 May	8.4	8.4	8.4	8.4	8.4	8.4
6 Jun	8.0	8.0	8.1	8.1	7.9	7.9
22 Jun	8.4	8.5	8.5	8.6	8.6	8.6
12 Jul	8.0	8.2	8.2	8.1	8.2	8.0
28 Jul	8.4	8.4	8.3	8.5	8.2	8.5
9 Aug	7.9	8.4	8.4	8.4	8.4	8.6
30 Aug	8.7	8.7	8.9	8.8	8.9	8.8
12 Sep	8.5	8.3	8.4	8.3	8.3	8.5
29 Sep	7.9	8.1	8.1	8.0	8.1	7.8
11 Oct	8.2	8.1	7.8	8.2	8.1	7.9
24 Oct	8.5	8.4	8.3	8.2	8.4	8.5
31 Oct	8.4	8.2	8.4	8.5	8.2	8.3
15 Nov	8.3	8.3	8.3	8.3	8.3	8.3
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	8.2	8.3	8.3	8.2	8.4	8.3

	20-Ft Contour			60-Ft Contour		
	NMPW	NMPP	NMPE	NMPW	NMPP	NMPE
Sp. Cond. (µmhos)						
5 Apr	365	370	330	355	365	325
19 Apr	330	320	320	340	320	320
3 May	NA	NA	NA	NA	NA	NA
17 May	340	305	320	360	360	320
6 Jun	600	470	435	540	500	415
22 Jun	420	385	325	340	345	315
12 Jul	380	330	322	370	335	300
28 Jul	390	337	342	340	340	338
9 Aug	355	340	380	350	380	320
30 Aug	385	365	305	380	319	318
12 Sep	370	365	325	339	343	330
29 Sep	540	490	360	350	360	340
11 Oct	340	350	380	320	320	350
24 Oct	350	300	340	355	335	340
31 Oct	310	310	310	320	315	315
15 Nov	310	300	310	320	310	350
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	440	395	400	430	370	400
Turbidity (NTU)						
5 Apr	2.4	3.5	3.5	2.4	2.6	1.9
19 Apr	1.0	0.7	0.9	0.9	0.9	0.8
3 May	NA	NA	NA	NA	NA	NA
16 May	1.1	1.0	1.0	1.1	1.0	1.0
6 Jun	NA	NA	NA	NA	NA	NA
22 Jun	1.7	1.5	1.3	1.1	1.2	1.2
12 Jul	1.8	1.3	1.2	1.3	0.8	0.8
28 Jul	2.0	1.6	1.9	1.8	1.5	1.6
9 Aug	1.1	0.9	1.1	0.8	1.0	1.1
30 Aug	1.7	1.7	1.3	1.8	1.4	1.4
12 Sep	1.6	2.2	2.2	1.2	2.0	1.2
29 Sep	7.8	2.6	3.4	2.7	3.2	1.7
11 Oct	3.9	3.3	2.3	2.9	1.8	3.8
24 Oct	0.8	0.6	0.9	0.7	0.7	0.6
31 Oct	1.3	1.5	2.7	1.1	2.3	2.8
15 Nov	2.0	2.6	2.9	2.8	1.5	3.4
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	2.1	1.4	1.8	1.7	1.5	1.4
Carbon Dioxide (mg/l)						
5 Apr	2.9	2.0	2.2	2.0	2.4	4.0
19 Apr	2.7	1.2	1.5	2.0	1.5	1.7
3 May	3.7	3.0	2.7	1.5	3.5	2.2
17 May	0.0	0.0	0.0	0.0	0.0	0.0
6 Jun	3.0	2.0	1.0	1.5	2.5	2.0
22 Jun	2.0	0.0	0.0	0.5	0.0	0.0
12 Jul	0.0	0.0	0.0	0.0	0.0	0.0
28 Jul	3.0	1.0	0.0	0.0	0.0	0.0
9 Aug	3.0	0.0	0.0	0.0	0.0	0.0
30 Aug	0.0	0.0	0.0	0.0	0.0	0.0
12 Sep	0.0	0.0	0.0	0.0	0.0	0.0
29 Sep	4.0	2.0	2.0	3.0	2.0	8.0
11 Oct	1.0	2.0	7.0	2.0	3.0	4.0
24 Oct	0.0	0.0	0.0	2.0	0.0	0.0
31 Oct	0.0	1.0	0.0	0.0	1.0	1.0
15 Nov	0.0	0.0	0.0	0.0	0.0	0.0
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	1.0	0.0	0.0	1.0	0.0	0.0

NS = Not sampled due to severe weather

NA = Sample not analyzed, instrument being recalibrated

MS = Samples not analyzed in lab, improper fixation

Table G-3 (CONTD)

Total Phos (mg/l-P)	20-Ft Contour NMPW	20-Ft Contour NMPP	20-Ft Contour NMPE	60-Ft Contour NMPW	60-Ft Contour NMPP	60-Ft Contour NMPE
5 Apr	0.055	0.029	0.026	0.017	0.025	0.027
19 Apr	0.010	0.024	0.034	0.024	0.022	0.012
3 May	0.034	0.034	0.029	0.026	0.019	0.011
17 May	0.026	0.021	0.021	0.023	0.024	0.027
6 Jun	0.031	0.030	0.021	0.028	0.027	0.020
22 Jun	0.028	0.037	0.027	0.026	0.028	0.028
12 Jul	0.015	0.012	0.015	0.011	0.010	0.009
18 Jul	0.014	0.012	0.014	0.014	0.022	0.017
9 Aug	0.016	0.009	0.013	0.018	0.014	0.008
30 Aug	0.011	0.009	0.010	0.015	0.003	0.013
12 Sep	0.019	0.020	0.018	0.018	0.019	0.029
29 Sep	0.068	0.050	0.030	0.026	0.027	0.024
11 Oct	0.014	0.033	0.025	0.018	0.016	0.016
24 Oct	0.018	0.061	0.030	0.019	0.016	0.020
31 Oct	0.009	0.009	0.011	0.011	0.032	0.015
15 Nov	0.020	0.021	0.019	0.028	0.023	0.026
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	0.020	0.016	0.020	0.017	0.015	0.015
Orthophosphorus (mg/l-P)						
5 Apr	0.010	0.011	0.010	0.010	0.010	0.011
19 Apr	0.005	0.009	0.008	0.008	0.008	0.007
3 May	0.007	0.008	0.004	0.003	0.003	0.009
17 May	0.002	0.002	<0.002	<0.002	<0.002	<0.002
6 Jun	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
22 Jun	0.007	0.006	0.005	0.005	0.007	0.006
12 Jul	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
28 Jul	0.004	0.003	0.002	<0.002	<0.002	<0.002
9 Aug	0.010	0.008	0.007	0.008	0.010	0.007
30 Aug	0.002	<0.002	0.004	0.002	0.002	0.003
12 Sep	0.004	0.003	0.002	0.002	0.002	0.002
29 Sep	0.031	0.024	0.010	0.008	0.006	0.004
11 Oct	0.007	0.006	0.008	0.006	0.004	0.013
24 Oct	0.004	0.003	0.003	0.004	0.003	0.006
31 Oct	0.006	0.009	0.002	<0.002	<0.002	<0.002
15 Nov	0.009	0.010	0.007	0.010	0.010	0.008
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	0.010	0.009	0.010	0.010	0.009	0.008
Silica (mg/l-SiO_2)						
5 Apr	0.52	0.63	0.60	0.56	0.65	0.48
19 Apr	0.39	0.37	0.34	0.46	0.37	0.37
3 May	1.32	1.25	0.77	0.70	0.64	0.35
17 May	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6 Jun	0.09	0.05	<0.05	0.08	0.17	0.06
22 Jun	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
12 Jul	0.15	0.13	0.22	0.18	0.14	0.22
28 Jul	0.08	0.13	0.11	0.12	0.11	0.12
9 Aug	0.17	0.15	0.14	0.16	0.14	0.14
30 Aug	0.11	0.13	0.14	0.12	0.13	0.12
12 Sep	0.13	0.10	0.16	0.10	0.09	0.15
29 Sep	1.73	1.34	0.45	0.36	0.39	0.24
11 Oct	0.52	0.41	0.67	0.44	0.41	0.52
24 Oct	0.36	0.37	0.40	0.36	0.35	0.39
31 Oct	0.22	0.20	0.22	0.20	0.20	0.21
15 Nov	0.52	0.52	0.24	0.60	0.53	0.35
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	0.34	0.37	0.36	0.31	0.25	0.39

Nitrate (mg/l-N)	20-Ft Contour NMPW	20-Ft Contour NMPP	20-Ft Contour NMPE	60-Ft Contour NMPW	60-Ft Contour NMPP	60-Ft Contour NMPE
5 Apr	0.29	0.32	0.29	0.30	0.32	0.28
19 Apr	0.18	0.21	0.22	0.19	0.21	0.21
3 May	0.53	0.53	0.40	0.36	0.35	0.29
17 May	0.19	0.19	0.18	0.19	0.19	0.18
6 Jun	0.29	0.26	0.24	0.28	0.26	0.24
22 Jun	0.14	0.13	0.11	0.11	0.11	0.11
12 Jul	0.16	0.19	0.17	0.15	0.15	0.19
28 Jul	0.05	0.04	0.04	0.05	<0.04	<0.04
9 Aug	0.06	0.05	0.05	0.06	0.05	<0.04
30 Aug	0.03	0.03	<0.02	0.02	0.03	0.03
12 Sep	0.06	0.05	0.03	0.04	0.04	0.03
29 Sep	0.43	0.36	0.21	0.19	0.20	0.16
11 Oct	0.20	0.25	0.22	0.20	0.22	0.23
24 Oct	0.23	0.20	0.19	0.20	0.20	0.20
31 Oct	0.17	0.14	0.13	0.15	0.16	0.18
15 Nov	0.30	0.30	0.24	0.31	0.30	0.26
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	0.32	0.30	0.32	0.30	0.29	0.29
Chlorophyll *a* (mg/l) ug/l						
5 Apr	5.53	7.57	6.05	4.44	5.73	3.64
19 Apr	1.92	2.08	2.52	2.48	2.20	1.92
3 May	15.82	15.14	7.61	7.81	9.53	1.72
17 May	12.01	10.01	9.41	13.02	12.22	11.21
6 Jun	11.85	5.61	7.05	9.95	8.73	5.29
22 Jun	5.93	12.01	11.93	6.49	12.18	7.17
12 Jul	4.41	3.40	3.70	3.30	2.70	0.80
28 Jul	8.71	3.20	5.71	7.51	3.90	7.41
9 Aug	3.00	3.00	5.01	4.41	3.50	5.01
30 Aug	12.12	18.72	12.92	9.81	12.12	16.22
12 Sep	12.34	9.77	19.14	2.16	8.33	<0.10
29 Sep	11.53	8.57	14.66	12.34	11.45	12.66
11 Oct	2.80	2.72	3.44	2.88	2.88	2.96
24 Oct	2.88	2.56	3.84	8.33	3.28	2.88
31 Oct	6.72	6.56	5.12	4.72	5.20	2.80
15 Nov	3.12	4.00	3.92	3.60	3.20	3.36
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	1.60	2.72	1.84	2.24	2.48	2.48
Phaeophytin *a* (mg/l) ug/l						
5 Apr	<0.10	<0.10	0.32	<0.10	<0.10	<0.10
19 Apr	0.66	0.13	0.56	0.66	0.21	0.15
3 May	1.84	3.92	5.85	2.31	2.66	0.10
17 May	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
6 Jun	1.00	0.77	0.41	1.03	1.07	0.62
22 Jun	1.85	1.07	0.32	0.91	1.00	0.54
12 Jul	2.53	1.85	1.62	2.02	0.94	<0.10
28 Jul	<0.10	<0.10	<0.10	<0.10	0.23	<0.10
9 Aug	0.71	0.36	<0.10	0.15	<0.10	<0.10
30 Aug	<0.10	<0.10	<0.10	2.10	<0.10	<0.10
12 Sep	<0.10	<0.10	1.11	<0.10	3.95	0.53
29 Sep	14.39	0.24	<0.10	<1.10	<0.10	<0.10
11 Oct	0.50	0.53	0.42	1.04	0.26	0.57
24 Oct	0.31	0.18	0.53	3.05	0.36	0.31
31 Oct	1.68	1.22	1.32	0.82	0.90	0.16
15 Nov	0.52	0.54	0.62	0.54	0.94	0.50
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	2.32	0.47	1.63	1.46	0.66	1.11

NS = Not sampled due to severe weather

Table G-3 (CONTD)

	20-Ft Contour			60-Ft Contour		
	NMPW	NMPP	NMPE	NMPW	NMPP	NMPE
Total Solids (mg/l)						
5 Apr	404	312	288	303	290	278
19 Apr	636	181	210	256	206	202
3 May	670	421	403	172	367	167
17 May	300	244	369	324	392	332
6 Jun	410	270	317	201	339	367
22 Jun	383	223	305	192	193	183
12 Jul	212	202	209	179	182	202
28 Jul	225	230	205	231	197	211
9 Aug	288	261	365	260	352	227
30 Aug	257	277	210	272	241	194
12 Sep	240	268	228	199	248	228
29 Sep	288	204	230	138	178	227
11 Oct	241	230	200	170	160	241
24 Oct	207	217	219	225	218	258
31 Oct	206	242	177	194	116	131
15 Nov	204	208	187	180	174	140
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	217	211	213	189	194	203
TSS (mg/l)						
5 Apr	3.0	1.2	4.8	4.2	5.2	3.2
19 Apr	0.8	0.2	0.6	1.2	1.0	1.0
3 May	0.8	0.6	1.0	<0.1	<0.1	<0.1
17 May	<0.1	<0.1	0.8	0.8	0.4	<0.1
6 Jun	0.6	0.8	<0.1	0.4	1.6	1.0
22 Jun	1.2	0.4	<0.1	2.2	<0.1	<0.1
12 Jul	0.3	0.3	0.3	1.0	2.0	0.2
28 Jul	1.3	0.1	1.1	1.5	0.3	0.5
9 Aug	0.5	<0.1	<0.1	0.5	0.5	<0.1
30 Aug	1.8	4.3	1.8	2.0	3.0	2.3
12 Sep	2.6	1.0	0.8	2.0	1.4	0.8
29 Sep	1.0	7.0	3.0	1.2	1.4	0.2
11 Oct	1.4	0.2	0.2	0.4	0.2	0.6
24 Oct	0.6	1.2	2.6	5.6	1.8	5.2
31 Oct	0.6	2.2	1.6	0.6	1.6	1.4
15 Nov	4.0	3.8	2.6	3.2	2.8	2.2
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	3.6	4.0	3.4	3.6	3.6	4.0
BOD-5 Day (mg/l)						
5 Apr	1.4	1.5	1.0	2.2	1.0	2.1
19 Apr	0.0	0.0	1.3	0.2	0.4	0.5
3 May	2.0	2.7	1.9	2.7	4.0	2.7
17 May	3.2	3.0	3.0	3.2	3.8	2.9
6 Jun	1.4	1.3	2.5	1.8	1.8	2.2
22 Jun	2.6	4.0	3.4	3.7	3.4	3.1
12 Jul	2.2	1.5	2.1	2.2	1.6	1.7
28 Jul	2.1	1.6	1.7	2.8	1.3	2.2
9 Aug	1.0	1.7	1.3	2.1	1.5	1.6
30 Aug	0.1	0.1	0.1	0.0	0.0	0.1
12 Sep	0.2	0.3	0.0	0.2	0.0	0.0
29 Sep	1.3	1.1	0.7	1.1	1.7	1.8
11 Oct	1.2	0.8	1.1	1.2	0.4	0.7
24 Oct	0.9	0.9	0.8	1.5	0.0	0.8
31 Oct	1.7	2.0	1.9	1.5	1.6	0.9
15 Nov	1.8	2.9	1.9	2.2	1.8	2.3
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	1.8	2.1	3.8	1.9	1.5	2.0

	20-Ft Contour			60-Ft Contour		
	NMPW	NMPP	NMPE	NMPW	NMPP	NMPE
COD (mg/l)						
5 Apr	6.1	6.5	7.0	6.2	6.9	8.0
19 Apr	5.3	7.7	7.1	8.4	7.1	6.4
3 May	16.0	16.9	13.5	11.4	10.8	4.0
17 May	6.8	6.9	6.1	6.3	7.3	6.1
6 Jun	22.8	22.0	20.5	17.7	18.6	17.7
22 Jun	9.9	10.0	8.6	6.7	8.4	8.5
12 Jul	8.4	7.7	7.9	8.3	8.0	7.7
28 Jul	8.3	8.0	8.0	8.2	8.1	7.8
9 Aug	10.7	12.6	16.6	15.7	17.7	13.8
30 Aug	8.6	7.0	6.8	6.8	5.5	5.8
12 Sep	7.3	7.9	7.0	6.2	6.7	6.5
29 Sep	10.1	9.5	7.2	6.7	6.7	5.6
11 Oct	6.8	6.3	7.0	6.8	5.9	7.1
24 Oct	6.7	6.8	7.2	7.1	7.0	7.2
31 Oct	8.2	9.0	9.9	9.0	9.2	9.5
15 Nov	10.5	10.3	9.4	10.8	10.8	9.8
7 Dec	NS	NS	NS	NS	NS	NS
Dec	4.9	4.5	4.4	4.6	4.2	4.3
TKN (mg/l-N)						
5 Apr	0.12	0.17	0.16	0.14	0.16	0.11
19 Apr	0.11	0.10	0.09	0.09	0.11	0.10
3 May	0.39	0.42	0.33	0.30	0.32	0.09
17 May	0.18	0.19	0.17	0.18	0.19	0.17
6 Jun	0.19	0.16	0.15	0.17	0.17	0.15
22 Jun	0.28	0.28	0.25	0.25	0.29	0.26
12 Jul	0.14	0.17	0.20	0.19	0.18	0.17
28 Jul	0.22	0.25	0.20	0.20	0.23	0.23
9 Aug	0.22	0.22	0.25	0.28	0.29	0.32
30 Aug	0.27	0.27	0.26	0.22	0.24	0.25
12 Sep	0.24	0.51	0.20	0.31	0.28	0.26
29 Sep	0.32	0.26	0.22	0.25	0.30	0.27
11 Oct	0.27	0.28	0.33	0.40	0.29	0.43
24 Oct	0.20	0.12	0.18	0.12	0.07	0.13
31 Oct	0.12	0.19	0.26	0.17	0.20	0.16
15 Nov	0.14	0.16	0.11	0.19	0.14	0.15
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	0.20	0.18	0.20	0.19	0.19	0.19
Ammonia (mg/l-N)						
5 Apr	0.028	0.013	0.016	0.013	0.014	0.029
19 Apr	0.022	0.029	0.033	0.021	0.025	0.034
3 May	0.480	0.372	0.336	0.316	0.264	0.055
17 May	0.040	0.043	0.044	0.043	0.047	0.044
6 Jun	0.024	0.021	0.012	0.028	0.023	0.014
22 Jun	0.064	0.070	0.056	0.068	0.078	0.076
12 Jul	0.016	0.019	0.040	0.018	0.024	0.038
28 Jul	0.026	0.048	0.032	0.048	0.035	0.030
9 Aug	0.061	0.059	0.066	0.103	0.073	0.093
30 Aug	0.011	0.008	0.004	0.012	0.006	0.022
12 Sep	0.077	0.097	0.097	0.146	0.079	0.185
29 Sep	0.088	0.084	0.065	0.066	0.084	0.068
11 Oct	0.039	0.042	0.052	0.052	0.050	0.054
24 Oct	0.016	<0.002	0.009	0.004	0.004	<0.002
31 Oct	0.019	0.017	0.027	0.017	0.015	0.024
15 Nov	0.030	0.033	0.026	0.046	0.034	0.034
7 Dec	NS	NS	NS	NS	NS	NS
13 Dec	0.087	0.144	0.095	0.115	0.106	0.118

NS = Not sampled due to severe weather

Table G-4

MONTHLY WATER QUALITY PARAMETERS AT THE 25- AND 45-FT CONTOURS ON THE NMPP/FITZ TRANSECT, NINE MILE POINT VICINITY, 1977

	25-Ft		45-Ft	
	Surface	Bottom	Surface	Bottom
Alkalinity (mg/l)				
29 Apr	95.0	95.5	94.5	94.0
17 May	96.0	96.0	96.0	94.0
23 Jun	98.0	98.0	100.0	98.0
28 Jul	93.0	90.0	91.0	91.0
29 Aug	91.0	98.0	91.0	93.0
29 Sep	92.0	92.0	95.0	92.0
24 Oct	89.0	90.0	90.0	89.0
14 Nov	104.0	104.0	105.0	104.0
15 Dec	102:0	102.0	101.0	101.0
Color (APHA units)				
29 Apr	1	1	1	1
17 May	1	1	1	1
23 Jun	1	1	1	1
28 Jul	1	1	1	1
29 Aug	1	1	1	1
29 Sep	1	1	1	1
24 Oct	1	1	1	1
14 Nov	1	1	1	1
15 Dec	1	1	1	1
Sp. Cond. (μmhos)				
29 Apr	340	365	330	345
17 May	240	285	300	280
23 Jun	325	310	360	320
28 Jul	200	320	210	225
29 Aug	298	275	310	270
29 Sep	360	280	360	360
24 Oct	340	330	280	330
14 Nov	340	370	350	370
15 Dec	350	300	360	380
Turbidity (NTU)				
29 Apr	2.8	1.6	1.3	2.8
17 May	1.0	1.1	1.0	1.0
23 Jun	1.0	0.8	1.2	0.8
28 Jul	1.7	2.3	1.3	2.0
29 Aug	1.9	1.8	2.0	2.5
29 Sep	2.4	2.6	3.1	2.7
24 Oct	2.0	0.7	1.0	7.9
14 Nov	2.1	4.1	4.1	1.7
15 Dec	2.0	2.0	1.8	2.3

	25-Ft		45-Ft	
	Surface	Bottom	Surface	Bottom
Total Solids (mg/l)				
29 Apr	193	265	144	242
17 May	212	226	296	228
23 Jun	154	141	198	227
28 Jul	238	228	253	250
29 Aug	253	222	326	219
29 Sep	239	219	188	219
24 Oct	213	194	193	191
14 Nov	222	207	175	181
15 Dec	171	197	170	173
TDS (mg/l)				
29 Apr	191	263	135	241
17 May	211	225	296	228
23 Jun	154	141	198	226
28 Jul	237	227	250	211
29 Aug	250	219	324	213
29 Sep	237	217	187	217
24 Oct	202	192	192	189
14 Nov	220	205	173	180
15 Dec	169	194	166	168
TSS (mg/l)				
29 Apr	1.6	2.4	9.4	1.4
17 May	1.4	1.0	0.2	0.4
23 Jun	0.2	0.2	<0.1	0.6
28 Jul	0.1	0.5	2.1	NS
29 Aug	3.3	3.3	1.8	6.0
29 Sep	1.6	1.8	1.2	1.6
24 Oct	11.4	1.6	1.4	2.4
14 Nov	2.2	2.0	1.8	0.6
15 Dec	2.2	2.8	4.0	5.2
TVS (mg/l)				
29 Apr	38	104	2	94
17 May	102	94	100	82
23 Jun	35	36	33	60
28 Jul	116	102	86	81
29 Aug	133	116	291	120
29 Sep	170	170	180	190
24 Oct	84	107	87	103
14 Nov	197	195	160	168
15 Dec	84	109	110	102

Table G-4 (CONTD)

		25-Ft		45-Ft	
		Surface	Bottom	Surface	Bottom
TKN (mg/l-N)					
29	Apr	0.14	0.12	0.11	0.10
17	May	0.17	0.17	0.17	0.14
23	Jun	0.25	0.18	0.19	0.17
28	Jul	0.21	0.27	0.22	0.24
29	Aug	0.26	0.24	0.22	0.22
29	Sep	0.35	0.18	0.38	0.26
24	Oct	0.16	0.18	0.13	0.22
14	Nov	0.12	0.13	0.14	0.14
15	Dec	0.23	0.27	0.20	0.21
Organic N (mg/l-N)					
29	Apr	0.09	0.08	0.07	0.07
17	May	0.13	0.12	0.12	0.11
23	Jun	0.23	0.16	0.17	0.14
28	Jul	0.16	0.21	0.14	0.16
29	Aug	0.25	0.22	0.19	0.17
29	Sep	0.25	0.10	0.31	0.20
24	Oct	0.15	0.17	0.12	0.20
14	Nov	0.07	0.10	0.09	0.11
15	Dec	0.17	0.21	0.15	0.16
Ammonia (mg/l-N)					
29	Apr	0.048	0.038	0.039	0.028
17	May	0.036	0.047	0.046	0.032
23	Jun	0.018	0.016	0.016	0.026
28	Jul	0.045	0.056	0.079	0.079
29	Aug	0.010	0.019	0.026	0.048
29	Sep	0.099	0.080	0.068	0.057
24	Oct	0.011	0.013	0.013	0.022
14	Nov	0.050	0.027	0.049	0.031
15	Dec	0.061	0.061	0.051	0.051
Nitrate (mg/l-N)					
29	Apr	0.32	0.31	0.31	0.30
17	May	0.20	0.20	0.21	0.23
23	Jun	0.16	0.17	0.17	0.18
28	Jul	0.04	0.04	0.05	0.06
29	Aug	0.03	0.04	0.02	0.07
29	Sep	0.21	0.20	0.20	0.22
24	Oct	0.20	0.20	0.19	0.20
14	Nov	0.31	0.30	0.30	0.30
15	Dec	0.30	0.30	0.30	0.30

		25-Ft		45-Ft	
		Surface	Bottom	Surface	Bottom
Total Phos. (mg/l-P)					
29	Apr	0.015	0.019	0.017	0.015
17	May	0.034	0.020	0.028	0.015
23	Jun	0.026	0.023	0.024	0.024
28	Jul	0.007	0.019	0.013	0.017
29	Aug	0.012	0.008	0.047	0.013
29	Sep	0.026	0.029	0.028	0.037
24	Oct	0.031	0.023	0.014	0.022
14	Nov	0.027	0.029	0.028	0.027
15	Dec	0.012	0.013	0.013	0.013
Silica (mg/l-SiO_2)					
29	Apr	0.36	0.35	0.35	0.35
17	May	<0.05	<0.05	<0.05	0.13
23	Jun	<0.05	0.07	0.05	0.07
28	Jul	0.19	0.22	0.12	0.34
29	Aug	0.28	0.37	0.24	0.56
29	Sep	0.54	0.44	0.45	0.52
24	Oct	0.36	0.37	0.33	0.35
14	Nov	0.52	0.52	0.51	0.52
15	Dec	0.30	0.26	0.36	0.31
Orthophosphorus (mg/l-P)					
29	Apr	0.009	0.009	0.012	0.010
17	May	0.004	0.003	0.004	0.003
23	Jun	0.010	0.004	0.005	0.003
28	Jul	<0.002	0.003	<0.002	<0.002
29	Aug	0.002	0.002	0.002	0.004
29	Sep	0.006	0.006	0.002	0.006
24	Oct	0.006	0.006	0.003	0.005
14	Nov	0.010	0.011	0.011	0.011
15	Dec	0.006	0.008	0.012	0.010

Table G-4 (CONTD)

		25-Ft		45-Ft	
Sodium (mg/l)		Surface	Bottom	Surface	Bottom
29	Apr	14.1	14.5	13.1	13.1
17	May	19.3	15.9	19.3	18.6
23	Jun	14.7	6.6	17.5	12.6
28	Jul	14.0	14.0	14.5	13.1
29	Aug	13.1	11.4	13.1	10.5
29	Sep	13.9	13.5	13.5	14.9
24	Oct	13.0	12.9	13.2	12.9
14	Nov	16.8	16.8	17.2	16.3
15	Dec	14.5	14.8	14.5	14.7
Potassium (mg/l)					
29	Apr	1.65	1.67	1.66	1.62
17	May	1.70	1.63	1.93	1.63
23	Jun	1.15	1.05	1.05	0.85
28	Jul	1.69	1.70	1.73	1.70
29	Aug	1.71	1.67	1.68	1.62
29	Sep	1.73	1.77	1.80	1.85
24	Oct	1.40	1.42	1.41	1.52
14	Nov	1.52	1.52	1.54	1.50
15	Dec	2.73	2.73	2.86	2.86
Calcium (mg/l)					
29	Apr	44.1	46.5	43.2	39.6
17	May	50.1	50.8	51.5	47.3
23	Jun	33.9	32.5	33.9	27.5
28	Jul	42.6	41.3	41.3	42.6
29	Aug	43.1	41.0	41.7	42.7
29	Sep	50.0	51.4	51.9	52.7
24	Oct	38.1	38.5	37.7	42.1
14	Nov	43.8	44.0	45.1	43.8
15	Dec	44.7	44.7	44.1	44.7
Aluminum (mg/l)					
29	Apr	0.006	0.005	0.008	0.001
17	May	0.039	0.050	0.029	0.041
23	Jun	0.023	0.017	0.020	0.015
28	Jul	0.026	0.029	0.046	0.238
29	Aug	0.050	0.129	0.216	0.079
29	Sep	0.194	0.147	0.076	0.105
24	Oct	0.116	0.094	0.069	0.061
14	Nov	0.062	0:063	0.081	0.054
15	Dec	0.088	0.091	0.189	0.122

		25-Ft		45-Ft	
Iron (mg/l)		Surface	Bottom	Surface	Bottom
29	Apr	0.005	0.008	0.009	0.003
17	May	0.096	0.163	0.019	0.109
23	Jun	0.070	0.042	0.047	0.029
28	Jul	0.167	0.251	0.177	0.613
29	Aug	0.067	0.161	0.108	0.159
29	Sep	0.207	0.173	0.108	0.150
24	Oct	0.118	0.053	0.046	0.246
14	Nov	0.086	0.087	0.085	0.083
15	Dec	0.123	0.110	0.097	0.091
Nickel (mg/l)					
29	Apr	0.002	0.003	0.004	0.002
17	May	0.007	0.005	0.004	0.004
23	Jun	0.008	0.003	0.003	0.002
28	Jul	0.050	<0.002	<0.002	<0.002
29	Aug	0.006	0.005	0.005	0.003
29	Sep	0.003	0.008	0.015	0.006
24	Oct	0.049	0.013	0.006	0.005
14	Nov	0.020	0.001	0.001	0.001
15	Dec	0.005	0.006	0.006	0.006
Manganese (mg/l)					
29	Apr	0.001	0.001	<0.001	0.001
17	May	0.010	0.022	0.008	0.007
23	Jun	0.004	0.003	0.006	0.002
28	Jul	0.006	0.023	0.017	0.092
29	Aug	0.008	0.015	0.010	0.017
29	Sep	0.010	0.010	0.009	0.013
24	Oct	0.015	0.008	0.009	0.044
14	Nov	0.007	0.008	0.008	0.007
15	Dec	<0.001	<0.001	<0.001	<0.001
Magnesium (mg/l)					
29	Apr	9.43	9.59	9.39	9.34
17	May	7.70	7.70	7.70	7.59
23	Jun	7.90	7.80	8.20	7.90
28	Jul	8.08	8.31	7.96	8.31
29	Aug	8.10	8.10	8.06	8.02
29	Sep	8.46	7.90	7.86	8.58
24	Oct	6.23	6.23	6.03	6.54
14	Nov	8.63	8.89	8.67	8.80
15	Dec	9.70	9.40	9.40	9.40

Table G-4 (CONTD)

	25-Ft Surface	25-Ft Bottom	45-Ft Surface	45-Ft Bottom
Cadmium (mg/l)				
29 Apr	0.001	<0.001	<0.001	<0.001
17 May	<0.001	<0.001	<0.001	<0.001
23 Jun	<0.001	<0.001	<0.001	<0.001
28 Jul	<0.001	<0.001	<0.001	<0.001
29 Aug	<0.001	<0.001	<0.001	<0.001
29 Sep	<0.001	<0.001	<0.001	<0.001
24 Oct	<0.001	<0.001	<0.001	<0.001
14 Nov	<0.001	<0.001	<0.001	<0.001
15 Dec	<0.001	<0.001	<0.001	<0.001
Chromium (mg/l)				
29 Apr	0.001	0.001	0.001	0.001
17 May	<0.001	<0.001	<0.001	0.001
23 Jun	0.001	0.001	0.001	0.001
28 Jul	<0.001	<0.001	<0.001	<0.001
29 Aug	<0.001	<0.001	<0.001	<0.001
29 Sep	<0.001	<0.001	<0.001	<0.001
24 Oct	<0.001	<0.001	<0.001	<0.001
14 Nov	<0.001	<0.001	<0.001	<0.001
15 Dec	<0.001	<0.001	<0.001	<0.001
Copper (mg/l)				
29 Apr	<0.001	0.001	0.005	<0.001
17 May	0.008	0.004	0.002	0.002
23 Jun	0.009	0.029	0.006	0.006
28 Jul	0.003	0.002	0.003	0.002
29 Aug	0.019	0.013	0.009	0.011
29 Sep	0.006	0.004	0.019	0.017
24 Oct	0.036	0.014	0.002	0.001
14 Nov	0.008	0.004	0.005	0.004
15 Dec	0.016	0.012	0.008	0.008
Mercury (mg/l)				
29 Apr	<0.0002	<0.0002	<0.0002	<0.0002
17 May	<0.0002	<0.0002	<0.0002	<0.0002
23 Jun	<0.0002	<0.0002	<0.0002	<0.0002
28 Jul	<0.0005	<0.0005	<0.0005	<0.0005
29 Aug	<0.0005	<0.0005	<0.0005	<0.0005
29 Sep	<0.0005	<0.0005	<0.0005	<0.0005
24 Oct	<0.0002	<0.0002	<0.0002	<0.0002
14 Nov	<0.0002	<0.0002	<0.0002	<0.0002
15 Dec	<0.0002	<0.0002	<0.0002	<0.0002

	25-Ft Surface	25-Ft Bottom	45-Ft Surface	45-Ft Bottom
Silver (mg/l)				
29 Apr	<0.001	<0.001	<0.001	<0.001
17 May	0.001	<0.001	<0.001	<0.001
23 Jun	<0.001	<0.001	<0.001	<0.001
28 Jul	<0.001	<0.001	<0.001	<0.001
29 Aug	<0.001	<0.001	<0.001	<0.001
29 Sep	<0.001	<0.001	<0.001	<0.001
24 Oct	<0.001	<0.001	<0.001	<0.001
14 Nov	0.001	0.001	0.001	0.001
15 Dec	<0.001	<0.001	<0.001	<0.001
Lead (mg/l)				
29 Apr	<0.001	0.001	0.001	<0.001
17 May	0.006	0.006	0.003	0.002
23 Jun	0.014	0.028	0.015	0.010
28 Jul	0.006	0.003	0.002	0.003
29 Aug	0.044	0.019	0.004	0.003
29 Sep	0.003	0.005	0.020	0.018
24 Oct	0.008	0.005	0.004	0.011
14 Nov	0.005	0.005	0.005	0.004
15 Dec	0.011	0.002	0.007	0.006
Zinc (mg/l)				
29 Apr	0.039	0.068	0.077	0.056
17 May	0.009	0.013	0.001	0.002
23 Jun	0.012	0.011	0.012	0.012
28 Jul	0.027	<0.001	0.015	0.024
29 Aug	0.025	0.018	0.015	0.020
29 Sep	0.013	0.013	0.022	0.017
24 Oct	0.008	0.006	0.006	0.016
14 Nov	0.015	0.012	0.008	0.007
15 Dec	0.012	0.010	0.018	0.016
Arsenic (mg/l)				
29 Apr	0.0010	0.0010	0.0006	0.0010
17 May	<0.0005	<0.0005	<0.0005	<0.0005
23 Jun	<0.0005	<0.0005	<0.0005	<0.0005
28 Jul	<0.0005	<0.0005	<0.0005	<0.0005
29 Aug	0.0060	0.0050	0.0060	0.0050
29 Sep	0.0030	0.0050	0.0050	0.0050
24 Oct	0.0020	0.0010	0.0020	0.0020
14 Nov	0.0016	0.0016	0.0020	0.0016
15 Dec	0.0210	0.0120	0.0140	0.0130

Table G-4 (CONTD)

Fluoride (mg/l-F)	25-Ft Surface	25-Ft Bottom	45-Ft Surface	45-Ft Bottom
29 Apr	0.09	0.09	0.09	0.09
17 May	0.13	0.11	0.11	0.12
23 Jun	0.20	0.16	0.18	0.16
28 Jul	0.05	0.05	0.05	0.05
29 Aug	<0.05	<0.05	<0.05	<0.05
29 Sep	<0.05	<0.05	0.05	0.08
24 Oct	0.14	0.14	0.13	0.14
14 Nov	0.12	0.12	0.12	0.12
15 Dec	0.12	0.13	0.13	0.13
Chloride (mg/l-Cl)				
29 Apr	39.6	31.4	27.7	27.5
17 May	43.6	43.6	53.2	53.2
23 Jun	31.7	26.1	39.5	25.9
28 Jul	30.0	30.8	29.6	27.6
29 Aug	33.2	28.4	33.4	27.9
29 Sep	34.7	34.3	33.0	36.9
24 Oct	27.1	26.8	27.0	27.1
14 Nov	32.5	32.7	32.7	34.2
15 Dec	29.2	28.6	30.0	31.4
Sulfate (mg/l-SO_4)				
29 Apr	30.4	30.8	29.6	29.4
17 May	30.5	28.7	32.3	28.2
23 Jun	28.3	27.2	29.5	27.5
28 Jul	35.9	36.7	36.7	35.9
29 Aug	36.4	34.8	34.2	35.9
29 Sep	28.1	28.0	28.0	28.7
24 Oct	21.2	21.5	21.9	20.8
14 Nov	20.7	20.8	20.7	20.8
15 Dec	27.2	27.2	27.4	27.4

Cyanide (mg/l)	25-Ft Surface	25-Ft Bottom	45-Ft Surface	45-Ft Bottom
29 Apr	<0.005	<0.005	<0.005	<0.005
17 May	<0.005	<0.005	<0.005	<0.005
23 Jun	<0.005	<0.005	<0.005	<0.005
28 Jul	<0.005	<0.005	<0.005	<0.005
29 Aug	<0.005	<0.005	<0.005	<0.005
29 Sep	<0.005	<0.005	<0.005	<0.005
24 Oct	<0.005	<0.005	<0.005	<0.005
14 Nov	<0.005	<0.005	<0.005	<0.005
15 Dec	<0.005	<0.005	<0.005	<0.005
Ferro CN (mg/l)				
29 Apr	NS	NS	NS	NS
17 May	<0.04	<0.04	<0.04	<0.04
23 Jun	<0.04	<0.04	<0.04	<0.04
28 Jul	<0.04	<0.04	<0.04	<0.04
29 Aug	<0.04	<0.04	<0.04	<0.04
29 Sep	<0.04	<0.04	<0.04	<0.04
24 Oct	<0.04	<0.04	<0.04	<0.04
14 Nov	<0.04	<0.04	<0.04	<0.04
15 Dec	<0.04	<0.04	<0.04	<0.04
Ferri CN (mg/l)				
29 Apr	NS	NS	NS	NS
17 May	<0.04	<0.04	<0.04	<0.04
23 Jun	<0.04	<0.04	<0.04	<0.04
28 Jul	<0.04	<0.04	<0.04	<0.04
29 Aug	<0.04	<0.04	<0.04	<0.04
29 Sep	<0.04	<0.04	<0.04	<0.04
24 Oct	<0.04	<0.04	<0.04	<0.04
14 Nov	<0.04	<0.04	<0.04	<0.04
15 Dec	<0.04	<0.04	<0.04	<0.04

NS = Not sampled, laboratory techniques were not developed for April sample analysis

Table G-4 (CONTD)

	25-Ft Surface	25-Ft Bottom	45-Ft Surface	45-Ft Bottom
Beryllium (mg/l)				
29 Apr	<0.001	<0.001	<0.001	<0.001
17 May	<0.001	<0.001	<0.001	<0.001
23 Jun	<0.001	<0.001	<0.001	<0.001
28 Jul	<0.001	<0.001	<0.001	<0.001
29 Aug	<0.001	<0.001	<0.001	<0.001
29 Sep	<0.001	<0.001	<0.001	<0.001
24 Oct	<0.001	<0.001	<0.001	<0.001
14 Nov	<0.001	<0.001	<0.001	<0.001
15 Dec	<0.001	<0.001	<0.001	<0.001
Barium (mg/l)				
29 Apr	0.025	0.023	0.026	0.029
17 May	0.004	0.006	0.004	0.005
23 Jun	0.010	0.011	0.012	0.012
28 Jul	0.037	0.012	0.026	0.028
29 Aug	0.037	0.040	0.034	0.028
29 Sep	0.043	0.044	0.044	0.039
24 Oct	0.044	0.047	0.046	0.051
14 Nov	0.051	0.053	0.044	0.046
15 Dec	0.018	0.011	0.008	0.008
Vanadium (mg/l)				
29 Apr	<0.001	<0.001	<0.001	<0.001
17 May	<0.002	<0.002	<0.002	<0.002
23 Jun	<0.002	<0.002	<0.002	<0.002
28 Jul	<0.002	<0.002	<0.002	<0.002
29 Aug	<0.002	<0.002	<0.002	<0.002
29 Sep	<0.002	<0.002	<0.002	<0.002
24 Oct	<0.001	<0.001	0.002	<0.001
14 Nov	<0.001	<0.001	<0.001	<0.001
15 Dec	0.001	0.002	0.002	0.001
Selenium (mg/l)				
29 Apr	<0.0005	<0.0005	<0.0005	<0.0005
17 May	<0.0005	<0.0005	<0.0005	<0.0005
23 Jun	<0.0005	<0.0005	<0.0005	<0.0005
28 Jul	<0.0003	<0.0003	<0.0003	<0.0003
29 Aug	0.0035	0.0026	0.0041	0.0032
29 Sep	0.0012	0.0032	0.0026	0.0026
24 Oct	<0.0010	<0.0010	<0.0010	<0.0010
14 Nov	<0.0010	<0.0010	<0.0010	<0.0010
15 Dec	0.0031	0.0033	0.0037	0.0035

	25-Ft Surface	25-Ft Bottom	45-Ft Surface	45-Ft Bottom
Gross Alpha (pCi/l)				
29 Apr	<1.13	<1.17	<1.08	<1.08
16 May	<1.16	<1.13	<1.16	<1.13
23 Jun	1.85	1.59	1.59	1.28
29 Jul	<1.13	<1.26	<1.47	<2.66
29 Aug	3.53	<0.89	<0.93	<0.92
29 Sep	<0.21	<0.20	<0.20	<0.21
24 Oct	<1.01	<1.01	<1.01	<1.13
14 Nov	<1.50	<1.50	<1.50	<1.50
15 Dec	<1.50	<1.50	2.45	<1.50
Gross Beta (pCi/l)				
29 Apr	2.73	<2.50	3.17	<2.50
16 May	3.59	2.50	2.72	9.25
23 Jun	2.80	<2.01	2.47	2.58
29 Jul	<2.39	<2.39	<2.39	5.66
29 Aug	<2.63	<2.63	<2.63	3.10
29 Sep	4.63	3.20	2.19	<1.94
24 Oct	5.34	4.84	3.25	7.34
14 Nov	2.90	3.58	3.15	<3.00
15 Dec	3.58	2.88	2.84	2.93
Gamma Spectroscopy (pCi/l)				
29 Apr	Below Detection		Below Detection	
17 May	Below Detection		Below Detection	
23 Jun	Below Detection		Below Detection	
28 Jul	Below Detection		Below Detection	
29 Aug	Below Detection		Below Detection	
29 Sep	Below Detection		Below Detection	
24 Oct	Below Detection		Below Detection	
14 Nov	Below Detection		Below Detection	
15 Dec	Below Detection		Below Detection	
Tritium (pCi/l)				
29 Apr	395	321	326	347
16 May	386	206	264	225
23 Jun	435	362	319	453
29 Jul	594	697	515	527
29 Aug	277	<200	290	295
29 Sep	367	252	296	347
24 Oct	391	549	605	431
14 Nov	109	133	218	235
15 Dec	183	207	320	260

Table G-4 (CONTD)

	25-Ft		45-Ft	
BOD - 5 Day (mg/l)	Surface	Bottom	Surface	Bottom
29 Apr	3.1	0.7	0.1	0.0
17 May	3.0	3.2	3.6	3.2
23 Jun	2.2	2.4	3.0	2.0
28 Jul	0.3	2.4	1.5	1.0
29 Aug	0.1	0.0	0.0	0.0
29 Sep	1.8	2.1	1.5	1.7
24 Oct	1.1	1.1	0.7	1.0
14 Nov	2.1	1.6	1.7	1.7
15 Dec	1.9	2.3	2.4	2.0
COD (mg/l)				
29 Apr	9.3	9.2	6.9	6.5
17 May	6.8	5.8	7.0	6.3
23 Jun	8.5	8.3	8.5	8.4
28 Jul	7.3	7.7	7.4	7.3
29 Aug	4.6	3.8	2.6	<2.0
29 Sep	6.5	6.8	6.6	6.8
24 Oct	7.0	7.1	7.0	7.0
14 Nov	10.0	9.8	10.6	10.8
15 Dec	4.0	3.5	3.8	3.7
T. Colif. (#/100ml)				
2 May	2400	38	38	38
26 May	240	38	38	38
23 Jun	2.2	2.2	15	8.8
28 Jul	8.8	7.6	8.8	5.0
29 Aug	8.8	38	21	2.2
29 Sep	2.2	5	8.8	5.0
24 Oct	13	13	5	33
14 Nov	348	33	109	172
15 Dec	172	348	>542	109
F. Colif. (#/100ml)*				
2 May	<30	<30	<30	<30
26 May	42	<30	<30	<30
23 Jun	<30	<30	<30	<30
28 Jul	86	169	114	>300
29 Aug	94	170	42	117
29 Sep	<2.2	<2.2	<2.2	<2.2
24 Oct	2	5	<2	<2
14 Nov	11	<2	2	5
15 Dec	17	5	8	17

	25-Ft		45-Ft	
Phenols (mg/l)	Surface	Bottom	Surface	Bottom
29 Apr	<0.005	0.005	0.005	<0.005
17 May	<0.005	<0.005	<0.005	<0.005
23 Jun	<0.005	<0.005	<0.005	<0.005
28 Jul	<0.005	<0.005	<0.005	<0.005
29 Aug	<0.005	<0.005	<0.005	<0.005
29 Sep	<0.005	<0.005	<0.005	<0.005
24 Oct	<0.005	<0.005	<0.005	<0.005
14 Nov	<0.005	<0.005	<0.005	<0.005>
15 Dec	<0.005	<0.005	<0.005	<0.005
MBAS (mg/l-LAS)				
29 Apr	<0.02	<0.02	<0.02	<0.02
17 May	<0.02	<0.02	<0.02	<0.02
23 Jun	<0.02	<0.02	<0.02	<0.02
28 Jul	<0.02	<0.02	<0.02	<0.02
29 Aug	<0.02	<0.02	<0.02	<0.02
29 Sep	<0.02	<0.02	<0.02	<0.02
24 Oct	<0.02	<0.02	<0.02	<0.02
14 Nov	<0.02	<0.02	<0.02	<0.02
15 Dec	<0.02	<0.02	<0.02	<0.02
TOC (mg/l)				
29 Apr	13.4	13.8	12.2	19.5
17 May	10.0	9.0	11.6	10.5
23 Jun	11.5	7.3	9.0	9.5
28 Jul	12.1	10.6	6.6	8.7
Aug	TOC superseded by CCE			
Sep				
Oct				
Nov				
Dec				
CCE (mg/l)				
29 Apr	See TOC above			
17 May				
23 Jun				
29 Jul	0.5	1.0	2.4	1.3
29 Aug	1.8	1.5	0.3	0.3
29 Sep	0.7	0.7	1.2	1.4
24 Oct	1.0	1.3	1.5	1.1
14 Nov	3.0	1.9	1.6	2.4
15 Dec	1.5	3.1	1.7	2.6

*Apr-Aug data represents total bacteria

APPENDIX H

IMPINGEMENT

- Nine Mile Point
- James A. FitzPatrick

Table H-1

PLANT OPERATING CONDITIONS AT NINE MILE POINT NUCLEAR STATION UNIT 1 DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[3] (°C) Discharge	Intake	Δ
1 Jan	2	1	1,270,077	581	19.5	3.4	16.1
2 Jan	2	1	1,270,077	584	19.5	3.4	16.1
3 Jan	2	1	1,270,077	583	19.5	3.3	16.2
4 Jan	2	1	1,270,077	579	20.1	4.1	16.0
5 Jan	2	1	1,270,077	577	19.8	3.7	16.1
6 Jan	2	1	1,270,077	575	21.4	5.1	16.3
7 Jan	2	1	1,270,077	573	21.1	4.6	16.5
8 Jan	2	1	1,270,077	493	17.5	3.5	14.0
9 Jan	2	1	1,280,979	524	18.3	3.4	14.9
10 Jan	2	1	1,270,077	579	19.9	3.6	16.3
11 Jan	2	1	1,270,077	583	19.5	3.1	16.4
12 Jan	2	1	1,270,077	581	19.5	2.9	16.6
13 Jan	2	1	1,270,077	583	19.9	3.9	16.0
14 Jan	2	1	1,270,077	582	20.2	3.9	16.3
15 Jan	2	1	1,280,979	585	20.2	3.9	16.3
16 Jan	2	1	1,270,077	582	19.5	3.3	16.2
17 Jan	2	1	1,270,077	573	19.5	3.3	16.2
18 Jan	2	1	1,253,724	577	20.4	4.4	16.0
19 Jan	2	1	1,291,881	582	20.1	4.0	16.1
20 Jan	2	1	1,291,881	583	20.3	4.2	16.1
21 Jan	2	1	1,291,881	584	20.2	4.0	16.2
22 Jan	2	1	1,291,881	582	20.4	4.4	16.0
23 Jan	2	1	1,291,881	584	20.1	4.2	15.9
24 Jan	2	1	1,291,881	584	20.6	4.4	16.2
25 Jan	2	1	1,291,881	582	20.0	3.8	16.2
26 Jan	2	1	1,291,881	582	19.5	3.3	16.2
27 Jan	2	1	1,291,881	582	19.6	3.4	16.2
28 Jan	2	1	1,253,724	582	19.6	3.4	16.2
29 Jan	2	1	1,270,077	582	19.4	3.3	16.1
30 Jan	2	1	1,270,077	578	19.3	3.3	16.1
31 Jan	2	1	1,270,077	575	19.2	3.3	16.1
1 Feb	2	1	1,270,077	574	19.2	3.3	15.9
2 Feb	2	1	1,270,077	571	19.9	4.0	15.9
3 Feb	2	1	1,280,979	568	19.6	3.9	15.7
4 Feb	2	1	1,270,077	566	19.2	3.4	15.8
5 Feb	2	1	1,270,077	460	16.8	3.5	13.3
6 Feb	2	1	1,270,077	528	18.1	3.5	14.6
7 Feb	2	1	1,270,077	564	20.5	4.4	16.1
8 Feb	2	1	1,270,077	587	20.2	4.1	16.1
9 Feb	2	1	1,270,077	587	20.3	4.1	16.2
10 Feb	2	1	1,270,077	585	20.0	3.8	16.2
11 Feb	2	1	1,280,979	586	20.3	4.0	16.3
12 Feb	2	1	1,280,979	583	19.9	3.6	16.3
13 Feb	2	1	1,270,077	584	20.0	3.7	16.3
14 Feb	2	1	1,270,077	582	19.5	3.4	16.1
15 Feb	2	1	1,270,077	583	19.6	3.7	15.9
16 Feb	2	1	1,270,077	582	19.9	3.7	16.2
17 Feb	2	1	1,270,077	582	19.8	3.6	16.2
18 Feb	2	1	1,270,077	573	19.8	3.7	16.1
19 Feb	2	1	1,280,979	584	19.7	3.6	16.1
20 Feb	2	1	1,270,077	584	19.7	3.7	16.0
21 Feb	2	1	1,280,979	582	19.7	3.7	16.0
22 Feb	2	1	1,280,979	579	19.7	3.7	16.0
23 Feb	2	1	1,280,979	114	NA	NA	NA
24 Feb	2	1	1,313,685	118	9.1	2.1	7.0
25 Feb	2	1	1,297,332	438	15.9	3.1	12.8
26 Feb	2	1	1,297,332	467	16.3	2.9	13.4
27 Feb	2	1	1,297,332	526	18.2	3.6	14.6
28 Feb	2	1	1,297,332	576	19.6	3.6	16.0

Table H-1 (CONTD)

PLANT OPERATING CONDITIONS AT NINE MILE POINT NUCLEAR STATION UNIT 1 DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[3] (°C) Discharge	Intake	Δ
1 Mar	2	1	1,297,332	581	20.0	3.7	16.3
2 Mar	2	1	1,297,332	581	21.1	4.2	16.9
3 Mar	2	1	1,297,332	584	21.0	4.3	16.7
4 Mar	2	1	1,297,332	551	19.4	3.8	15.6
5 Mar	2	1	1,477,214	12	2.3	0.6	1.7
6 Mar	2	1	1,477,214	0	0.2	0.0	0.2
7 Mar	2	1	1,477,214	0	0.3	0.1	0.2
8 Mar	2	1	1,477,214	0	0.6	0.3	0.3
9 Mar	2	1	1,477,214	0	0.6	0.3	0.3
10 Mar	2	1	1,477,214	0	0.4	0.2	0.2
11 Mar	2	1	1,477,214	0	0.6	0.3	0.3
12 Mar	2	1	1,477,214	0	0.9	0.7	0.2
13 Mar	2	1	1,477,214	0	1.1	0.8	0.3
14 Mar	2	1	1,477,214	0	1.1	0.8	0.3
15 Mar	2	1	1,477,214	0	0.9	0.7	0.2
16 Mar	2	1	1,477,214	0	1.4	1.1	0.3
17 Mar	2	1	1,477,214	0	2.9	2.7	0.2
18 Mar	2	1	1,477,214	0	0.9	0.6	0.3
19 Mar	2	1	1,477,214	0	0.3	0.2	0.1
20 Mar	2	1	1,477,214	0	0.5	0.3	0.2
21 Mar	2	1	1,477,214	0	0.2	0.0	0.2
22 Mar	2	1	1,477,214	0	0.4	0.2	0.2
23 Mar	2	1	1,477,214	0	0.2	0.0	0.2
24 Mar	2	1	1,477,214	0	0.0	0.0	0.0
25 Mar	2	1	1,477,214	0	0.1	0.0	0.1
26 Mar	2	1	1,477,214	0	0.1	-0.1	0.2
27 Mar	2	1	1,477,214	0	0.3	0.1	0.2
28 Mar	2	1	1,477,214	0	0.3	0.1	0.2
29 Mar	2	1	1,477,214	0	0.9	0.7	0.2
30 Mar	1	1	812,195	0	1.4	1.2	0.2
31 Mar	1	1	812,195	0	1.0	2.7	-1.7
1 Apr	1	1	812,195	0		4.3	
2 Apr	1	1	812,195	0		3.4	
3 Apr	1	1	812,195	0		4.7	
4 Apr	1	1	812,195	0		4.1	
5 Apr	1	1	812,195	0		4.7	
6 Apr	1	1	812,195	0		4.9	
7 Apr	1	1	812,195	0		5.1	
8 Apr	1	1	812,195	0		5.6	
9 Apr	1	1	812,195	0		5.7	
10 Apr	1	1	812,195	0		5.4	
11 Apr	1	1	812,195	0		5.8	
12 Apr	1	1	812,195	0		6.2	
13 Apr	1	1	812,195	0		5.2	
14 Apr	1	1	812,195	0		6.6	
15 Apr	1	1	812,195	0		6.4	
16 Apr	1	1	812,195	0		NA	
17 Apr	1	1	812,195	0		7.4	
18 Apr	1	1	812,195	0		6.2	
19 Apr	1	1	812,195	0		6.4	
20 Apr	1	1	812,195	0		6.6	
21 Apr	1	1	812,195	0		6.1	
22 Apr	1	1	812,195	0		8.6	
23 Apr	1	1	812,195	0		7.3	
24 Apr	1	1	812,195	0		7.6	
25 Apr	1	1	812,195	0		7.2	
26 Apr	1	1	812,195	0		7.3	
27 Apr	1	1	812,195	0		6.3	
28 Apr	1	1	812,195	0		8.0	
29 Apr	1	1	812,195	0		8.6	
30 Apr	1	1	812,195	0		8.8	

Table H-1 (CONTD)

PLANT OPERATING CONDITIONS AT NINE MILE POINT NUCLEAR STATION UNIT 1 DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[3] (°C) Discharge	Intake	Δ
1 May	1	1	812,195	0		9.3	
2 May	1	1	812,195	0		10.3	
3 May	1	1	812,195	0		10.7	
4 May	1	1	812,195	0		9.4	
5 May	1	1	812,195	0		8.5	
6 May	1	1	812,195	0		8.5	
7 May	1	1	812,195	0		9.1	
8 May	1	1	812,195	0		9.6	
9 May	1	1	812,195	0		9.6	
10 May	1	1	812,195	0		9.1	
11 May	1	1	812,195	0		9.6	
12 May	1	1	812,195	0		10.2	
13 May	1	1	812,195	0		10.1	
14 May	1	1	812,195	0		10.0	
15 May	1	1	812,195	0		10.5	
16 May	2	1	1,237,372	0		8.7	
17 May	2	1	1,567,701	0		8.6	
18 May	2/1[a]	1	1,221,019	0		8.8	
19 May	1	1	755,505	0		11.0	
20 May	1	1	755,505	0		11.5	
21 May	1	1	755,505	0		11.7	
22 May	1	1	755,505	0		11.7	
23 May	1	1	755,505	0		11.0	
24 May	1	1	755,505	0		13.0	
25 May	1	1	755,505	0		13.1	
26 May	1	1	755,505	0		13.4	
27 May	1	1	755,505	0		12.8	
28 May	1	1	755,505	0		13.6	
29 May	1	1	755,505	0		12.1	
30 May	1	1	755,505	0		10.8	
31 May	1	1	755,505	0		10.8	
1 Jun	1	1	763,137	0		10.3	
2 Jun	1/2[b]	1	1,030,234	0		9.7	
3 Jun	2	1	1,482,665	0		7.7	
4 Jun	2	1	1,389,999	0		8.2	
5 Jun	2	1	1,482,665	0		9.3	
6 Jun	2/1/2[c]	1	1,433,607	0		9.5	
7 Jun	2	1	1,482,665	0		10.3	
8 Jun	2	1	1,482,665	0		9.6	
9 Jun	2	1	1,482,665	0		8.1	
10 Jun	2	1	1,482,665	0		7.2	
11 Jun	2	1	1,482,665	0		8.4	
12 Jun	2	1	1,482,665	0		9.5	
13 Jun	2	1	1,482,665	0		9.7	
14 Jun	2	1	1,482,665	0		9.7	
15 Jun	2	1	1,482,665	0		11.0	
16 Jun	2	1	1,482,665	0		12.4	
17 Jun	2	1	1,482,665	0		10.8	
18 Jun	2	1	1,482,665	0		11.5	
19 Jun	2	1	1,482,665	0		12.2	
20 Jun	2	1	1,482,665	0		12.8	
21 Jun	2	1	1,482,665	0		13.6	
22 Jun	2	1	1,482,665	0		14.2	
23 Jun	2	1	1,482,665	0		12.9	
24 Jun	2	1	1,482,665	0		13.5	
25 Jun	2	1	1,482,665	0		13.8	
26 Jun	2	1	1,482,665	0		15.1	
27 Jun	2	1	1,482,665	0		15.5	
28 Jun	2	1	1,482,665	0		14.6	
29 Jun	2	1	1,482,665	0		16.6	
30 Jun	2	1	1,482,665	0		16.3	

Table H-1 (CONTD)

PLANT OPERATING CONDITIONS AT NINE MILE POINT NUCLEAR STATION UNIT 1 DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[3] (°C) Discharge	Intake[4]	Δ
1 Jul	2	1	1,531,724	0		16.5	
2 Jul	2	1	1,411,803	0		16.5	
3 Jul	2	1	1,531,724	0		NA	
4 Jul	2	1	1,531,724	0		14.5	
5 Jul	2/1[d]	1	1,531,724	0		18.0	
6 Jul	2	1	1,531,724	0		17.4	
7 Jul	2	1	1,531,724	0		15.0	
8 Jul	2	1	1,531,724	0		13.5	
9 Jul	2	1	1,531,724	0		15.5	
10 Jul	2	1	1,531,724	0		NA	
11 Jul	2	1	1,531,724	0		13.4	
12 Jul	2	1	1,531,724	0		13.9	
13 Jul	2/1[e]	1	1,171,960	0		14.0	
14 Jul	1/2[f]	1	1,411,803	0		18.0	
15 Jul	2	1	1,569,881	0		21.5	
16 Jul	2/1[g]	1	1,177,411	0		20.5	
17 Jul	1/2[i]	1	1,084,744	0		NA	
18 Jul	2	1	1,531,724	100	23.7	22.7	1.0
19 Jul	2	1	1,569,881	207	23.8	22.8	1.0
20 Jul	2	2	1,608,038	285	34.5	23.6	10.9
21 Jul	2	2	1,608,038	415	37.5	24.7	12.8
22 Jul	2	2	1,608.038	497	38.4	23.0	15.4
23 Jul	2	2	1,608,038	530	39.0	22.9	16.1
24 Jul	2	2	1,608,038	542	39.0	22.9	16.1
25 Jul	2	2	1,608,038	554	39.8	23.3	16.5
26 Jul	2	2	1,608,038	554	39.9	23.3	16.6
27 Jul	2	2	1,608,038	560	38.8	22.2	16.6
28 Jul	2	2	1,608,038	572	38.9	22.1	16.8
29 Jul	2	2	1,608,038	568	38.6	21.9	16.7
30 Jul	2	2	1,608,038	543	38.1	21.9	16.2
31 Jul	2	2	1,608,038	578	39.1	22.6	16.5
1 Aug	2	2	1,580,783	576	39.0	22.1	16.9
2 Aug	2	2	1,580,783	575	39.1	22.4	16.7
3 Aug	2	2	1,580,783	577	38.5	21.7	16.8
4 Aug	2	2	1,580,783	573	38.5	21.7	16.8
5 Aug	2	2	1,580,783	574	38.8	22.1	16.7
6 Aug	2	2	1,580,783	578	38.9	22.2	16.7
7 Aug	2	2	1,580,783	577	38.7	22.1	16.6
8 Aug	2	2	1,580,783	580	39.1	22.5	16.6
9 Aug	2	2	1,580,783	580	38.7	22.1	16.6
10 Aug	2	2	1,580,783	583	38.0	21.4	16.6
11 Aug	2	2	1,580,783	582	38.8	22.1	16.7
12 Aug	2	2	1,580,783	578	39.7	23.0	16.7
13 Aug	2	2	1,580,783	536	38.4	22.8	15.6
14 Aug	2	2	1,580,783	584	39.6	23.0	16.6
15 Aug	2	2	1,580,783	582	39.5	22.8	16.7
16 Aug	2	2	1,580,783	580	38.8	22.1	16.7
17 Aug	2	2	1,580,783	582	38.7	22.1	16.6
18 Aug	2	2	1,580,783	582	38.1	21.5	16.6
19 Aug	2	2	1,580,783	581	37.4	20.9	16.5
20 Aug	2	2	1,580,783	579	36.9	20.5	16.4
21 Aug	2	2	1,580,783	584	36.8	20.4	16.4
22 Aug	2	2	1,580,783	582	36.5	20.0	16.5
23 Aug	2	2	1,580,783	584	36.3	19.8	16.5
24 Aug	2	2	1,580,783	587	36.4	19.9	16.5
25 Aug	2	2	1,580,783	586	36.1	19.7	16.4
26 Aug	2	2	1,580,783	588	36.2	19.6	16.6
27 Aug	2	2	1,580,783	591	36.4	19.8	16.6
28 Aug	2	2	1,580,783	588	37.5	20.9	16.6
29 Aug	2	2	1,580,783	585	37.9	21.2	16.7
30 Aug	2	2	1,580,783	582	38.3	21.6	16.7
31 Aug	2	2	1,580,783	587	37.9	21.1	16.8

Table H-1 (CONTD)

PLANT OPERATIONG CONDITIONS AT NINE MILE POINT NUCLEAR STATION UNIT 1 DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[3] (°C) Discharge	Intake	Δ
1 Sep	2	2	1,586,234	590	37.6	20.9	16.7
2 Sep	2	2	1,586,234	587	38.3	21.5	16.8
3 Sep	2	2	1,586,234	584	38.6	21.7	16.9
4 Sep	2	2	1,586,234	581	38.5	21.7	16.8
5 Sep	2	2	1,586,234	586	38.3	21.4	16.9
6 Sep	2	2	1,586,234	587	38.3	21.5	16.8
7 Sep	2	2	1,586,234	587	38.4	20.9	17.5
8 Sep	2	2	1,586,234	589	36.5	19.8	16.7
9 Sep	2	2	1,586,234	596	34.9	18.0	16.9
10 Sep	2	2	1,586,234	592	36.0	19.2	16.8
11 Sep	2	2	1,586,234	592	36.4	19.3	17.1
12 Sep	2	2	1,586,234	592	36.1	19.3	16.8
13 Sep	2	2	1,586,234	589	35.9	19.1	16.8
14 Sep	2	2	1,586,234	588	35.9	19.1	16.8
15 Sep	2	2	1,586,234	590	35.8	19.1	16.7
16 Sep	2	2	1,586,234	592	34.7	18.0	16.7
17 Sep	2	2	1,586,234	591	35.3	18.6	16.7
18 Sep	2	2	1,586,234	588	36.0	19.2	16.8
19 Sep	2	2	1,586,234	590	35.9	19.1	16.8
20 Sep	2	2	1,586,234	593	35.1	18.3	16.8
21 Sep	2	2	1,586,234	588	34.8	17.3	17.5
22 Sep	2	2	1,586,234	595	34.5	17.6	16.9
23 Sep	2	2	1,586,234	593	32.6	15.2	17.4
24 Sep	2	2	1,586,234	603	28.8	12.0	16.8
25 Sep	2	2	1,586,234	608	23.4	6.6	16.8
26 Sep	2	2/1[h]	1,586,234	607	23.3	6.5	16.8
27 Sep	2	1	1,586,234	603	27.2	10.3	16.9
28 Sep	2	1	1,586,234	602	29.8	13.0	16.8
29 Sep	2	1	1,586,234	602	30.2	13.0	17.2
30 Sep	2	1	1,586,234	570	30.0	13.9	16.1
1 Oct	2	1	1,444,509	267	23.5	14.7	8.8
2 Oct	2	1	1,444,509	378	25.9	14.4	11.5
3 Oct	2	1	1,444,509	446	27.2	14.1	13.1
4 Oct	2	1	1,444,509	521	29.0	13.8	15.2
5 Oct	2	1	1,444,509	580	30.9	14.4	16.5
6 Oct	2	1	1,444,509	590	31.1	14.4	16.7
7 Oct	2	1	1,444,509	594	31.3	14.6	16.7
8 Oct	2	1	1,444,509	595	30.1	13.5	16.6
9 Oct	2	1	1,444,509	594	30.2	13.6	16.6
10 Oct	2	1	1,444,509	595	29.9	13.2	16.7
11 Oct	2	1	1,444,509	595	30.0	13.1	16.9
12 Oct	2	1	1,444,509	596	29.4	12.7	16.7
13 Oct	2	1	1,444,509	595	29.4	13.8	15.6
14 Oct	2	1	1,444,509	600	29.8	13.1	16.7
15 Oct	2	1	1,444,509	599	29.9	13.1	16.8
16 Oct	2	1	1,444,509	601	30.0	13.1	16.9
17 Oct	2	1	1,444,509	596	29.1	12.2	16.9
18 Oct	2	1	1,444,509	601	28.6	11.8	16.8
19 Oct	2	1	1,444,509	601	29.1	12.2	16.9
20 Oct	2	1	1,444,509	603	29.4	12.6	16.8
21 Oct	2	1	1,444,509	519	26.5	12.0	14.5
22 Oct	2	1	1,264,626	0[k]	11.4	10.9	0.5
23 Oct	2	1	1,264,626	0	11.6	11.3	0.3
24 Oct	2	1	1,444,509	0	11.5	11.2	0.3
25 Oct	2	1	1,444,509	0	11.3	11.1	0.2
26 Oct	2	1	1,444,509	0	11.7	11.2	0.5
27 Oct	2	1	1,444,509	0	11.6	11.3	0.3
28 Oct	2	1	1,444,509	283	21.2	10.9	10.3
29 Oct	2	1	1,444,509	420	24.4	11.9	12.5
30 Oct	2	1	1,444,509	558	27.7	12.0	15.7
31 Oct	2	1	1,444,509	588	28.0	11.5	16.5

Table H-1 (CONTD)

PLANT OPERATING CONDITIONS AT NINE MILE POINT NUCLEAR STATION UNIT 1 DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[3] (°C) Discharge	Intake	Δ
1 Nov	2	1	1,433,607	598	28.3	11.4	16.9
2 Nov	2	1	1,433,607	601	28.2	12.6	15.6
3 Nov	2	1	1,433,607	602	28.1	11.2	16.9
4 Nov	2	1	1,433,607	602	28.4	11.4	17.0
5 Nov	2	1	1,433,607	601	28.5	11.6	16.9
6 Nov	2	1	1,433,607	447	16.1	9.7	6.4
7 Nov	NA	NA	NA	0[m]	9.0	8.7	0.3
8 Nov	NA	NA	NA	0	6.1	5.9	0.2
9 Nov	NA	NA	NA	0	6.1	5.9	0.2
10 Nov	NA	NA	NA	0	6.6	6.4	0.2
11 Nov	NA	NA	NA	0	8.7	8.3	0.4
12 Nov	2	1	1,433,607	351	19.4	9.0	10.4
13 Nov	2	1	1,433,607	492	23.1	9.2	13.9
14 Nov	2	1	1,433,607	596	23.7	8.8	14.9
15 Nov	2	1	1,433,607	603	24.6	7.8	16.8
16 Nov	2	1	1,433,607	593	24.2	7.7	16.5
17 Nov	2	1	1,433,607	600	24.4	7.6	16.8
18 Nov	2	1	1,433,607	606	24.0	7.2	16.8
19 Nov	2	1	1,433,607	608	23.7	6.8	16.9
20 Nov	2	1	1,433,607	607	25.0	8.2	16.8
21 Nov	2	1	1,433,607	605	24.7	8.3	16.4
22 Nov	2	1	1,433,607	606	24.4	7.5	16.9
23 Nov	2	1	1,433,607	608	25.1	8.2	16.9
24 Nov	2	1	1,433,607	610	24.2	7.3	16.9
25 Nov	2	1	1,433,607	608	24.4	7.6	16.8
26 Nov	2	1	1,433,607	606	23.9	7.1	16.8
27 Nov	2	1	1,433,607	587	22.7	5.9	16.8
28 Nov	2	1	1,433,607	57	8.8	5.9	2.9
29 Nov	2	1	1,433,607	434	18.6	5.8	12.8
30 Nov	2	1	1,433,607	517	21.5	6.7	14.8
1 Dec	2	1	1,482,665	599	23.8	7.2	16.6
2 Dec	2	1	1,482,665	607	21.7	4.9	16.8
3 Dec	2	1	1,482,665	610	22.1	6.0	16.1
4 Dec	2	1	1,482,665	610	20.5	4.3	16.2
5 Dec	2	1	1,482,665	608	22.5	5.7	16.8
6 Dec	2	1	1,482,665	608	21.9	4.6	17.3
7 Dec	2	1	1,482,665	606	20.8	3.7	17.1
8 Dec	2	1	1,482,665	606	21.6	4.8	16.8
9 Dec	2	1	1,379,097	605	22.1	5.2	16.9
10 Dec	2	1	1,264,626	606	19.8	3.8	16.0
11 Dec	2	1	1,264,626	607	22.1	6.1	16.0
12 Dec	2	1	1,264,626	607	22.6	6.1	16.5
13 Dec	2	1	1,264,626	608	24.2	7.6	16.6
14 Dec	2	1	1,264,626	608	23.8	7.3	16.5
15 Dec	2	1	1,264,626	608	23.7	7.1	16.6
16 Dec	2	1	1,264,626	599	24.1	7.7	16.4
17 Dec	2	1	1,264,626	596	23.3	7.0	16.3
18 Dec	2	1	1,264,626	609	23.0	6.4	16.6
19 Dec	2	1	1,264,626	609	23.5	7.0	16.5
20 Dec	2	1	1,264,626	608	23.7	7.2	16.5
21 Dec	2	1	1,264,626	612	23.1	6.7	16.4
22 Dec	2	1	1,264,626	612	22.2	5.7	16.5
23 Dec	2	1	1,264,626	598	21.5	4.4	17.1
24 Dec	2	1	1,264,626	580	23.7	7.1	16.6
25 Dec	2	1	1,264,626	553	20.4	5.3	15.1
26 Dec	2	1	1,264,626	602	20.1	3.8	16.3
27 Dec	2	1	1,264,626	610	20.6	4.1	16.5
28 Dec	2	1	1,264,626	610	20.4	3.8	16.6
29 Dec	2	1	1,264,626	611	20.4	3.8	16.6
30 Dec	2	1	1,264,626	597	19.8	2.1	17.7
31 Dec	2	1	1,264,626	342	12.9	1.4	11.5

Table H-1 (CONTD)

PLANT OPERATING CONDITIONS AT NINE MILE POINT NUCLEAR STATION UNIT 1 DURING 1977

FOOTNOTES: Plant Operating Conditions at Nine Mile Point Nuclear Station, Unit 1, during 1977

[1]Number of pumps operating during Jan-Mar based on water flows given in "401" monthly reports. After March, pump data were collected daily from the control room at Nine Mile Point Station

[2]Volume of water pumped each day derived from average net discharge flow data in Nine Mile Point Unit 1 "401" monthly reports.

[3]Power production and water temperatures from Nine Mile Point Unit 1 "401" monthly reports.

[4]Inlet temperatures on computer printout erroneous from 7/8/78 to 7/17/78. Temperatures recorded for this period are down current temperatures taken in front of the trash racks at beginning of sampling period.

[a]Two pumps operating from 0000 to 1305, 18 May; one pump operating from 1305 to 2359, 18 May.

[b]Pump change outside sampling period - data not collected.

[c]Two pumps operating from 0000 to 1037, 6 Jun; one pump operating from 1037 to 1437, 6 Jun; two pumps operating from 1437 to 2359, 6 Jun.

[d]Two pumps operating from 0000 to 0930, 5 Jul; one pump operating from 0930 to 2359, 5 Jul.

[e]Two pumps operating from 0000 to 1150, 13 Jul; one pump operating from 1150 to 2359, 13 Jul.

[f]One pump operating from 0000 to 0415, 14 Jul; two pumps operating from 0415 to 2359, 14 Jul.

[g]Two pumps operating from 0000 to 0820, 16 Jul; one pump operating from 0820 to 2359, 16 Jul.

[h]Two pumps operating from 0000 to 2000, 26 Sep; one pump operating from 2000 to 2359, 26 Sep.

[i]Pump data not available.

[j]Unit down at ≈2200, 4 Mar to ≈1200, 18 Jul.

[k]Unit down at ≈2300, 21 Oct to 0500, 28 Oct.

[m]Unit down at ≈1300, 6 Nov to ≈0100, 12 Nov.

NA - Not available.

Table H-2

PLANT OPERATING CONDITIONS AT JAMES A. FITZPATRICK NUCLEAR STATION DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[4] (°C) Discharge	Intake	Δ
1 Jan	3	1	2,060,469	734	22.3	6.4	15.9
2 Jan	3	1	2,060,469	736	22.5	6.4	16.1
3 Jan	3	1	2,060,469	740	22.8	6.7	16.1
4 Jan	3	1	2,060,469	737	22.7	6.6	16.1
5 Jan	3	1	2,060,469	738	22.5	6.5	16.0
6 Jan	3	1	2,060,469	740	23.1	7.2	15.9
7 Jan	3	1	2,060,469	703	19.8	4.0	15.8
8 Jan	3	1	2,060,469	538	15.2	2.4	12.8
9 Jan	3	1	2,060,469	609	16.7	2.6	14.1
10 Jan	3	1	2,060,469	695	18.5	2.8	15.7
11 Jan	3	1	2,060,469	741	20.7	4.5	16.2
12 Jan	3	1	2,060,469	738	20.9	4.7	16.2
13 Jan	3	1	2,060,469	738	21.1	NA	NA
14 Jan	3	1	2,060,469	729	20.9	NA	NA
15 Jan	3	1	2,060,469	739	21.4	NA	NA
16 Jan	3	1	2,060,469	740	21.0	NA	NA
17 Jan	3	1	2,060,469	741	21.0	NA	NA
18 Jan	3	1	2,060,469	741	21.1	NA	NA
19 Jan	3	1	2,060,469	738	21.0	4.6	16.4
20 Jan	3	1	2,060,469	738	21.0	4.7	16.3
21 Jan	3	1	2,060,469	700	20.1	4.4	15.7
22 Jan	NA	NA	1,776,564	231	8.5	1.8	6.7
23 Jan	NA	NA	1,406,352	243	10.6	2.4	8.2
24 Jan	NA	NA	1,752,489	626	20.3	4.7	15.6
25 Jan	3	1	2,060,469	712	21.0	5.3	15.7
26 Jan	3	1	2,060,469	738	21.0	4.7	16.3
27 Jan	3	1	2,060,469	738	22.1	6.1	16.0
28 Jan	3	1	2,060,469	740	22.0	6.0	16.0
29 Jan	3	1	2,060,469	735	22.7	6.6	16.1
30 Jan	3	1	2,060,469	735	NA	NA	NA
31 Jan	3	1	2,060,469	737	22.4	6.2	16.2
1 Feb	NA	NA	1,896,940	553	17.0	4.5	12.5
2 Feb	NA	NA	1,422,790	0[n]	1.5	0.4	1.1
3 Feb	NA	NA	1,429,518	0	1.8	0.7	1.1
4 Feb	NA	NA	1,406,674	75	5.7	1.5	4.2
5 Feb	NA	NA	1,406,352	134	10.7	3.0	7.7
6 Feb	NA	NA	1,406,352	394	23.5	11.9	11.6
7 Feb	NA	NA	1,406,352	491	24.4	10.4	14.0
8 Feb	NA	NA	1,406,352	499	21.3	7.1	14.2
9 Feb	NA	NA	1,406,352	501	21.4	7.2	14.2
10 Feb	NA	NA	1,406,352	503	21.4	7.3	14.1
11 Feb	NA	NA	1,406,352	479	20.7	7.1	13.6
12 Feb	NA	NA	1,406,352	410	18.5	6.2	12.3
13 Feb	NA	NA	1,406,352	537	22.5	7.8	14.7
14 Feb	NA	NA	1,831,498	613	22.6	8.0	14.6
15 Feb	3	1	2,060,469	681	22.1	7.6	14.5
16 Feb	3	1	2,060,469	738	23.7	8.1	15.6
17 Feb	3	1	2,060,469	740	24.0	8.1	15.9
18 Feb	3	1	2,060,469	703	21.1	7.2	13.9
19 Feb	3	1	2,060,469	683	16.5	5.5	11.0
20 Feb	3	1	2,060,469	569	18.7	6.3	12.4
21 Feb	3	1	2,060,469	642	21.6	8.0	13.6
22 Feb	3	1	2,060,469	713	23.2	8.1	15.1
23 Feb	3	1	2,060,469	737	23.7	8.1	15.6
24 Feb	3	1	2,060,469	738	24.0	8.3	15.7
25 Feb	3	1	2,060,469	707	23.8	8.5	15.3
26 Feb	3	1	2,060,469	684	23.0	8.0	15.0
27 Feb	3	1	2,060,469	738	24.0	8.4	15.6
28 Feb	NA	NA	2.027.886	687	23.0	8.2	14.8

Table H-2 (CONTD)

PLANT OPERATING CONDITIONS AT JAMES A. FITZPATRICK NUCLEAR STATION DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[4] (°C) Discharge	Intake	Δ
1 Mar	NA	NA	1,406,352	76	6.6	2.8	3.8
2 Mar	NA	NA	1,406,352	483	22.7	8.8	13.9
3 Mar	NA	NA	1,506,286	512	22.8	8.6	14.2
4 Mar	NA	NA	1,406,352	499	22.2	8.3	13.9
5 Mar	NA	NA	1,406,352	573	24.5	8.8	15.7
6 Mar	NA	NA	1,899,211	645	22.2	7.8	14.4
7 Mar	NA	NA	1,787,920	410	14.0	4.9	9.1
8 Mar	NA	NA	1,406,352	79	11.5	3.7	7.8
9 Mar	NA	NA	1,406,352	470	21.6	7.9	13.7
10 Mar	NA	NA	1,862,871	643	23.2	8.4	14.8
11 Mar	NA	NA	1,432,244	64	4.8	2.0	2.8
12 Mar	NA	NA	1,406,352	473	21.9	8.4	13.5
13 Mar	NA	NA	1,958,717	633	23.0	8.9	14.1
14 Mar	3	1	2,060,469	701	23.9	8.8	15.1
15 Mar	3	1	2,060,469	740	22.7	6.6	16.1
16 Mar	3	1	2,060,469	740	22.9	6.7	16.2
17 Mar	3	1	2,060,469	740	NA	NA	NA
18 Mar	3	1	2,060,469	725	21.3	5.2	16.1
19 Mar	3	1	2,060,469	737	21.1	4.9	16.2
20 Mar	3	1	2,060,469	740	21.6	5.4	16.2
21 Mar	3	1	2,060,469	742	21.1	4.9	16.2
22 Mar	3	1	2,060,469	741	21.1	4.9	16.2
23 Mar	3	1	2,060,469	741	21.1	4.8	16.3
24 Mar	3	1	2,060,469	711	20.3	4.6	15.7
25 Mar	3	1	2,060,469	589	17.2	3.8	13.4
26 Mar	3	1	2,060,469	717	20.5	4.7	15.8
27 Mar	3	1	2,060,469	740	21.3	5.0	16.3
28 Mar	3	1	2,060,469	741	21.6	5.4	16.2
29 Mar	3	1	2,060,469	743	22.0	5.8	16.2
30 Mar	3	1	2,060,469	743	22.2	6.1	16.1
31 Mar	3	1	2,060,469	742	21.6	5.4	16.2
1 Apr	3	1	2,060,469	735	21.6	5.5	16.1
2 Apr	3	1	2,060,469	734	21.8	5.6	16.2
3 Apr	3	1	2,060,469	742	22.8	6.5	16.3
4 Apr	3	1	2,060,469	741	19.7	2.9	16.8
5 Apr	3	1	2,060,469	742	22.2	5.9	16.3
6 Apr	3	1	2,060,469	743	23.0	6.5	16.5
7 Apr	3	1	2,060,469	700	22.0	6.1	15.9
8 Apr	3	1	2,060,469	323	15.1	4.8	10.3
9 Apr	3	1	2,060,469	444	16.3	5.2	11.1
10 Apr	3	1	2,060,469	505	17.3	5.2	12.1
11 Apr	3	1	2,060,469	581	19.3	5.9	13.4
12 Apr	3	1	2,060,469	654	21.5	6.8	14.7
13 Apr	3	1	2,060,469	740	23.2	6.9	16.3
14 Apr	3	1	2,060,469	728	22.5	5.9	16.6
15 Apr	3/2[a]	1	2,060,469	451	14.1	2.8	11.3
16 Apr	2	1	1,421,382	0[p]	3.2	2.7	0.5
17 Apr	2	1	1,406,352	161	10.3	3.2	7.1
18 Apr	2/3[b]	1	1,531,261	427	17.0	3.2	13.8
19 Apr	3	1	2,060,469	523	15.6	2.8	12.8
20 Apr	3	1	2,072,438	601	17.5	3.5	14.0
21 Apr	3	1	2,060,469	677	18.9	3.4	15.5
22 Apr	3	1	2,060,469	725	22.0	5.5	16.5
23 Apr	3	1	2,060,469	739	21.3	4.6	16.7
24 Apr	3	1	2,060,469	739	21.6	4.9	16.7
25 Apr	3	1	2,060,469	738	21.1	4.4	16.7
26 Apr	3	1	2,060,469	738	20.5	3.6	16.9
27 Apr	3	1	2,060,469	739	20.1	3.2	16.9
28 Apr	3	1	2,060,469	738	21.0	4.1	16.9
29 Apr	3	1	2,060,469	701	21.1	5.0	16.1
30 Apr	3	1	2,060,469	492	18.6	7.2	11.4

Table H-2 (CONTD)

PLANT OPERATING CONDITIONS AT JAMES A. FITZPATRICK NUCLEAR STATION DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[4] (°C) Discharge	Intake	Δ
1 May	3	1	2,060,469	552	18.6	5.9	12.7
2 May	3	1	2,060,469	624	21.5	7.5	14.0
3 May	3	1	2,060,469	697	23.0	7.4	15.6
4 May	3	1	2,060,469	512	17.5	5.4	12.1
5 May	3/2[c]	1	1,551,711	87	7.7	4.6	3.1
6 May	2	1	1,406,352	0[q]	5.7	4.8	0.9
7 May	2	1	1,406,352	26	7.6	5.4	2.2
8 May	2	1	1,406,352	470	20.7	6.9	13.8
9 May	2/3[c]	1	2,033,214	650	21.0	6.5	14.5
10 May	3	1	2,060,469	706	20.7	4.9	15.8
11 May	3	1	2,060,469	741	23.1	6.7	16.4
12 May	3	1	2,060,469	740	24.0	7.7	16.3
13 May	3	1	2,060,469	741	23.5	7.1	16.4
14 May	3	1	2,060,469	744	23.0	6.6	16.4
15 May	3	1	2,060,469	743	23.5	7.1	16.4
16 May	3	1	2,060,469	743	23.6	7.3	16.3
17 May	3	1	2,060,469	745	24.6	8.2	16.4
18 May	3	1	2,060,469	744	24.6	8.3	16.3
19 May	3	1	2,060,469	745	24.5	8.2	16.3
20 May	3/2[c]	1	1,516,734	127	12.5	8.4	4.1
21 May	2	1	1,406,448	353	20.6	9.4	11.2
22 May	2/3[c]	1	1,931,917	600	22.9	8.8	14.1
23 May	3	1	2,060,469	680	24.2	8.9	15.3
24 May	3	1	2,060,469	735	26.9	10.4	16.5
25 May	3	1	2,065,617	739	26.3	9.4	16.9
26 May	3	1	2,060,469	742	27.6	10.7	16.9
27 May	3	1	2,060,469	744	26.7	9.7	17.0
28 May	3	1	2,060,469	739	27.0	10.1	16.9
29 May	3	1	2,060,469	739	25.7	8.8	16.9
30 May	3	1	2,060,469	736	24.4	7.5	16.9
31 May	3	1	2,060,469	733	23.5	6.6	16.9
1 Jun	3	1	2,061,131	731	23.2	6.4	16.8
2 Jun	3	1	2,060,469	727	24.3	7.7	16.6
3 Jun	3	1	2,060,469	690	23.6	7.7	15.9
4 Jun	3	1	2,060,469	561	21.3	8.4	12.9
5 Jun	3	1	2,060,469	630	23.7	9.3	14.4
6 Jun	3	1	2,060,469	690	25.9	10.1	15.8
7 Jun	3	1	2,060,469	721	26.7	10.4	16.3
8 Jun	3	1	2,060,469	713	25.7	9.5	16.2
9 Jun	3	1	2,060,469	710	24.8	8.6	16.2
10 Jun	3	1	2,060,469	709	24.6	8.3	16.3
11 Jun	3	1	2,060,469	708	25.0	8.9	16.1
12 Jun	3	1	2,060,469	710	25.9	9.8	16.1
13 Jun	3	1	2,060,469	706	26.4	10.4	16.0
14 Jun	3	1	2,060,469	703	26.7	10.8	15.9
15 Jun	3	1	2,060,469	698	27.2	11.4	15.8
16 Jun	3	1	2,060,469	692	29.0	13.4	15.6
17 Jun	3	1	2,060,469	691	27.4	11.8	15.6
18 Jun	3	1	2,060,469	687	27.8	12.3	15.5
19 Jun	3	1	2,060,469	685	28.2	12.8	15.4
20 Jun	3	1	2,033,214	643	28.0	13.3	14.7
21 Jun	3/2[d]	1	654,117	30	15.9	13.8	2.1
22 Jun	2/1[c]	1	654.117	0[r]	14.2	14.0	0.2
23 Jun	1	1	654.117	0	13.9	13.7	0.2
24 Jun	1	1	654,117	0	14.1	13.9	0.2
25 Jun	1	1	654,117	0	14.5	14.3	0.2
26 Jun	1	1	654,117	0	15.9	15.7	0.2
27 Jun	1	1	654,117	0	16.6	16.5	0.1
28 Jun	1	1	654,117	0	15.1	14.9	0.2
29 Jun	1	1	654,117	0	17.8	17.6	0.2
30 Jun	1	1	654,117	0	18.0	17.7	0.3

Table H-2 (CONTD)

PLANT OPERATING CONDITIONS AT JAMES A. FITZPATRICK NUCLEAR STATION DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[4] (°C) Discharge	Intake	Δ
1 Jul	1	1	654,117	0	17.1	16.9	0.2
2 Jul	1	1	654,117	0	17.8	17.8	0.0
3 Jul	1	1	654,117	0	17.6	17.8	-0.2
4 Jul	1	1	654,117	0	16.8	16.7	0.1
5 Jul	1	1	654,117	0	17.7	17.6	0.1
6 Jul	1	1	654,117	0	17.3	17.3	0.0
7 Jul	1	1	654,117	0	15.1	15.2	-0.1
8 Jul	1	1	654,117	0	15.3	15.4	0.1
9 Jul	1	1	654,117	0	18.0	16.7	1.3
10 Jul	1	1	654,117	0	17.7	16.9	0.8
11 Jul	1	1	654,117	0	15.0	15.1	-0.1
12 Jul	1	1	654,117	0	14.9	15.1	-0.2
13 Jul	0	1	NA	0	19.4	18.9	0.5
14 Jul	0	1	NA	0	24.5	21.7	2.8
15 Jul	0/1[e]	1	NA	0	22.4	22.0	0.4
16 Jul	1	1	NA	0	21.5	20.3	1.2
17 Jul	1	1	NA	0	22.1	21.2	0.9
18 Jul	1	2	NA	0	23.5	23.1	0.4
19 Jul	1	2	NA	0	24.0	23.3	0.7
20 Jul	1	2	NA	0	24.8	24.0	0.8
21 Jul	1	2	NA	0	25.4	24.5	0.9
22 Jul	1	2	NA	0	25.8	24.9	0.9
23 Jul	1	2	NA	0	25.5	24.4	1.1
24 Jul	1	2	NA	0	NA	NA	NA
25 Jul	1	2	NA	0	24.9	24.4	0.5
26 Jul	1	2	NA	0	24.2	24.1	0.1
27 Jul	1	2	NA	0	23.1	23.1	0.0
28 Jul	1	2	NA	0	22.8	22.3	0.5
29 Jul	1	2	NA	0	22.9	22.8	0.1
30 Jul	1	2	NA	0	22.7	22.6	0.1
31 Jul	1	2	NA	0	23.0	22.9	0.1
1 Aug	1	2	654,117	0	23.6	23.4	0.2
2 Aug	1	2/1[c]	654,117	0	23.3	23.2	0.1
3 Aug	1	1	654,117	0	22.8	22.7	0.1
4 Aug	1	1	654,117	0	23.0	22.9	0.1
5 Aug	1	1	654,117	0	23.2	23.2	0.0
6 Aug	1	1	654,117	0	23.0	22.8	0.2
7 Aug	1	1	654,117	0	22.9	22.8	0.1
8 Aug	1	1	654,117	0	23.2	23.1	0.1
9 Aug	1	1	654,117	0	23.1	23.0	0.1
10 Aug	1	1	654,117	0	22.2	22.0	0.2
11 Aug	1	1	654,117	0	22.8	22.7	0.1
12 Aug	1	1	654,117	0	23.7	23.5	0.2
13 Aug	1	1	654,117	0	23.3	23.0	0.3
14 Aug	1	1/2[c]	654,117	0	23.7	23.3	0.4
15 Aug	1	2	654,117	0	25.1	25.1	0.0
16 Aug	1	2	654,117	0	22.5	22.5	0.0
17 Aug	1	2	654,117	0	22.5	22.2	0.3
18 Aug	1	2	654,117	0	22.3	22.1	0.2
19 Aug	1	2	654,117	0	21.9	21.4	0.5
20 Aug	1	2	654,117	0	21.9	20.9	1.0
21 Aug	1	2	654,117	0	21.0	20.9	0.1
22 Aug	1	2	654,117	0	20.9	20.9	0.0
23 Aug	1	2	654,117	0	20.7	20.7	0.0
24 Aug	1	2	654,117	0	20.7	20.6	0.1
25 Aug	1	2	654,117	0	24.6	24.2	0.4
26 Aug	1	2	654,117	0	24.1	22.9	1.2
27 Aug	1	2	654,117	0	NA	NA	NA
28 Aug	1	2	654,117	0	NA	NA	NA
29 Aug	1	2	654,117	0	NA	NA	NA
30 Aug	1	2	654,117	0	NA	NA	NA
31 Aug	1	2	654,117	0	NA	NA	NA

Table H-2 (CONTD)

PLANT OPERATING CONDITIONS AT JAMES A. FITZPATRICK NUCLEAR STATION DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[4] (°C) Discharge	Intake	Δ
1 Sep	1	2	654,117	0	22.1	NA	NA
2 Sep	1	2	654,117	0	NA	NA	NA
3 Sep	1	2	654,117	0	NA	NA	NA
4 Sep	1	2	654,117	0	22.5	22.1	0.4
5 Sep	1	2	654,117	0	22.1	21.7	0.4
6 Sep	1	2	654,117	0	22.2	21.7	0.5
7 Sep	1	2	654,117	0	NA	NA	NA
8 Sep	1	2/1[c]	654,117	0	21.0	20.2	0.8
9 Sep	1	1	654,117	0	18.5	18.1	0.4
10 Sep	1	1	654,117	0	20.0	19.5	0.5
11 Sep	1	1	654,117	0	20.6	19.7	0.9
12 Sep	1	1	654,117	0	19.8	19.5	0.3
13 Sep	1	1	654,117	0	19.7	19.4	0.3
14 Sep	1	1	654,117	0	19.5	19.1	0.4
15 Sep	1	1	654,117	0	19.5	18.7	0.8
16 Sep	1	1	654,117	0	NA	NA	NA
17 Sep	1	1	654,117	0	NA	NA	NA
18 Sep	1	1	654,117	0	NA	NA	NA
19 Sep	1	1	654,117	0	NA	NA	NA
20 Sep	1	1	654,117	0	NA	NA	NA
21 Sep	1	1	654,117	0	18.3	17.7	0.6
22 Sep	1	1	654,117	0	17.9	17.4	0.5
23 Sep	1/2[f]	1	654,117	0	18.5	16.9	1.6
24 Sep	2	1	654,117	0	16.1	13.7	2.4
25 Sep	2	1	2,060,469	5	10.0	6.8	3.2
26 Sep	2	1	2,060,469	8	8.3	6.3	2.0
27 Sep	2	1	2,060,469	83	14.7	9.5	5.2
28 Sep	2	1	2,060,469	178	20.5	13.0	7.5
29 Sep	2	1	2,060,469	201	NA	NA	NA
30 Sep	2	1	2,060,469	377	NA	NA	NA
1 Oct	2	1	1,315,502	372	NA	NA	NA
2 Oct	2	1	1,315,502	430	NA	NA	NA
3 Oct	2	1	1,315,502	NA	NA	NA	NA
4 Oct	2/3[g]	1	1,687,986	618	NA	NA	NA
5 Oct	3	1	2,060,469	550	NA	NA	NA
6 Oct	3/2[c]	1	2,060,469	545	NA	NA	NA
7 Oct	2	1	1,315,502	72	19.7	14.9	4.8
8 Oct	2	1	1,315,502	289	NA	NA	NA
9 Oct	2/3[c]	1	1,315,502	376	25.7	13.7	12.0
10 Oct	3	1	1,687,986	457	26.2	13.4	12.8
11 Oct	3	1	2,060,469	527	25.3	13.2	12.1
12 Oct	3	1	2,060,469	599	26.6	13.1	13.5
13 Oct	3	1	2,060,469	597	26.6	12.8	13.8
14 Oct	3	1	2,109,528	463	23.7	12.7	11.0
15 Oct	3	1	2,158,586	549	25.1	12.6	12.5
16 Oct	3	1	2,158,586	613	27.0	13.1	13.9
17 Oct	3	1	2,158,586	671	27.1	11.7	15.4
18 Oct	3	1	2,158,586	736	28.7	12.1	16.6
19 Oct	3	1	2,158,586	753	29.3	12.2	17.1
20 Oct	3	1	2,158,586	783	30.2	12.2	18.0
21 Oct	3	1	2,158,586	755	29.5	12.3	17.2
22 Oct	3	1	2,158,586	608	25.6	11.7	13.9
23 Oct	3	1	2,158,586	669	27.0	11.7	15.3
24 Oct	3	1	2,158,586	737	28.3	11.7	16.6
25 Oct	3	1	2,158,586	800	30.0	11.8	18.2
26 Oct	3	1	2,158,586	805	30.3	12.0	18.3
27 Oct	3	1	2,158,586	808	NA	NA	NA
28 Oct	3	1	2,158,586	703	28.4	12.5	15.9
29 Oct	3	1	2,158,586	643	26.6	12.0	14.6
30 Oct	3	1	2,158,586	716	28.0	11.8	16.2
31 Oct	3	1	2,158,586	792	29.4	11.6	17.8

Table H-2 (CONTD)

PLANT OPERATING CONDITIONS AT JAMES A. FITZPATRICK NUCLEAR STATION DURING 1977

Date	No. of Circulating Water Pumps[1]	No. of Service Water Pumps[1]	Total Volume of Water Pumped[2] (m^3)	Mean Electrical Output[3] (MWe)	Temperature[4] (°C) Discharge	Intake	Δ
1 Nov	3	1	2,158,586	819	29.7	11.2	18.4
2 Nov	3	1	2,158,586	818	29.9	11.3	18.6
3 Nov	3	1	2,158,586	818	29.9	11.3	18.6
4 Nov	3	1	2,158,586	814	30.0	11.7	18.3
5 Nov	3	1	2,158,586	815	30.0	11.7	18.3
6 Nov	3	1	2,158,586	822	29.9	11.3	18.6
7 Nov	3	1	2,158,586	823	28.9	10.3	18.6
8 Nov	3/2[c]	1	1,455,411	74	14.0	8.2	5.8
9 Nov	2	1	1,315,502	0[s]	10.3	9.6	0.7
10 Nov	2/1[c]	1	1,315,502	0	8.8	8.1	0.7
11 Nov	1	1	1,315,502	0	11.1	10.1	1.0
12 Nov	1/2[h]	1	1,315,502	82	18.2	9.2	9.0
13 Nov	2	1	1,315,502	440	22.6	8.8	13.8
14 Nov	2	1	1,315,502	501	25.0	9.7	15.3
15 Nov	2/3[c]	1	1,315,502	564	24.7	8.0	16.7
16 Nov	3	1	1,687,986	675	23.9	8.0	15.9
17 Nov	3	1	2,060,469	688	23.9	7.9	16.0
18 Nov	3	1	2,060,469	722	24.2	7.5	16.7
19 Nov	3	1	2,060,469	777	25.0	7.2	17.8
20 Nov	3	1	2,060,469	815	27.0	8.4	18.6
21 Nov	3	1/2[i]	2,109,528	820	27.4	8.6	18.8
22 Nov	3	2	2,158,586	826	27.0	8.1	18.9
23 Nov	3	2	2,158,586	828	NA	NA	NA
24 Nov	3	2	2,158,586	826	27.1	8.1	19.0
25 Nov	3	2	2,158,586	823	26.5	7.6	18.9
26 Nov	3	2	2,158,586	828	26.5	7.5	19.0
27 Nov	3	2	2,158,586	828	25.2	5.9	19.3
28 Nov	3	2	2,158,586	828	25.6	6.4	19.2
29 Nov	3	2	2,158,586	827	25.4	6.2	19.2
30 Nov	3	2	2,158,586	826	25.6	6.7	18.9
1 Dec	3	2	2,158,586	827	25.6	6.7	18.9
2 Dec	3/2[j]	2	1,831,528	774	23.4	5.0	18.4
3 Dec	2	2	1,504,469	379	18.9	6.1	12.8
4 Dec	2	2	1,504,469	487	20.0	5.0	15.0
5 Dec	2	2	2,158,586	550	NA	NA	NA
6 Dec	2/3[k]	2	2,158,586	600	17.8	3.1	14.7
7 Dec	3	2	2,158,586	670	16.7	NA	NA
8 Dec	3	2	2,158,586	730	18.3	5.6	12.7
9 Dec	3	2	2,158,586	770	17.8	5.6	12.2
10 Dec	3	2/1[m]	2,109,528	760	15.6	1.7	13.9
11 Dec	3	1	2,060,469	770	NA	NA	NA
12 Dec	3	1	2,060,469	780	16.7	3.3	13.4
13 Dec	3	1	2,060,469	776	21.7	3.9	17.8
14 Dec	3	1	2,060,469	780	21.7	3.3	18.4
15 Dec	3	1	2,060,469	780	21.7	3.9	17.8
16 Dec	3	1	2,060,469	745	22.2	5.0	17.2
17 Dec	3	1	2,060,469	624	18.3	3.3	15.0
18 Dec	3	1	2,060,469	702	18.9	2.2	16.7
19 Dec	3	1	2,060,469	773	20.6	2.8	17.8
20 Dec	3	1	2,060,469	817	22.1	0.0	22.1
21 Dec	3	1	2,060,469	823	22.2	2.8	19.4
22 Dec	3	1	2,060,469	822	22.8	3.9	18.9
23 Dec	3	1	2,060,469	820	22.2	2.8	19.4
24 Dec	3	1	2,060,469	824	22.2	2.8	19.4
25 Dec	3	1	2,060,469	822	22.2	2.2	20.0
26 Dec	3	1	2,060,469	822	21.7	2.2	19.5
27 Dec	3	1	2,060,469	821	23.4	4.4	19.0
28 Dec	3	1	2,060,469	820	23.4	4.4	19.0
29 Dec	3	1	2,060,469	819	22.8	4.4	18.4
30 Dec	3	1	2,060,469	817	22.8	3.9	18.9
31 Dec	3	1	2,060,469	819	23.4	3.9	19.5

Table H-2 (CONTD)

PLANT OPERATING CONDITIONS AT JAMES A. FITZPATRICK NUCLEAR STATION DURING 1977

FOOTNOTES: Plant Operating Conditions at James a FitzPatrick Nuclear Station, 1977

[1]Number of pumps operating during Jan-Mar based on water flows given in "401" monthly reports. After March, pump data were collected daily from the control room at James A. FitzPatrick Station.

[2]Volume of water pumped each day derived from average circulating water flow rate data in James A. FitzPatrick "401" monthly reports.

[3]Power production data from James A. FitzPatrick "401" monthly reports.

[4]Temperature data from James A. FitzPatrick plant operations computer printouts, except for December when average temperatures were obtained from the "401" report.

[a]Three pumps operating from 0000 to 1450, 15 Apr; two pumps operating from 1450 to 2359, 15 Apr.

[b]Two pumps operating from 0000 to 1925, 18 Apr; three pumps operating from 1925 to 2359, 18 Apr.

[c]Pump change outside sampling period (data not collected).

[d]Three pumps operating from 0000 to 0300, 21 Jun; two pumps operating from 0300 to 2359, 21 Jun.

[e]Zero pumps operating from 0000 to 2240, 15 Jul; one pump operating from 2240 to 2359, 15 Jul.

[f]One pump operating from 0000 to 2300, 23 Sep; two pumps operating from 2300 to 2359, 23 Sep.

[g]Two pumps operating from 0000 to 0635, 4 Oct; three pumps operating from 0635 to 2359, 4 Oct.

[h]One pump operating from 0000 to 0735, 12 Nov; two pumps operating from 0735 to 2359, 12 Nov.

[i]One pump operating from 0000 to 1800, 21 Nov; two pumps operating from 1800 to 2359, 21 Nov.

[j]Three pumps operating from 0000 to 2335, 2 Dec; two pumps operating from 2335 to 2359, 2 Dec.

[k]Two pumps operating from 0000 to 0932, 6 Dec; three pumps operating from 0932 to 2359, 6 Dec.

[m]Two pumps operating from 0000 to 0200, 10 Dec; one pump operating from 0200 to 2359, 10 Dec.

[n]Unit down from 1900, 1 Feb to ≈1300, 4 Feb.

[p]Unit down from 1450, 15 Apr to ≈1200, 17 Apr.

[q]Unit down from ≈0800, 5 May to ≈2200, 7 May.

[r]Unit down from ≈0600, 21 Jun to ≈2000, 27 Sep.

[s]Unit down from ≈1300, 8 Nov to ≈1500, 12 Nov.

NA = Data not available.

Table H-3

NUMERICAL ABUNDANCE AND PERCENT COMPOSITION OF IMPINGED FISH COLLECTED AT NINE MILE POINT NUCLEAR STATION UNIT 1, JAN-DEC 1977

Species	Jan*		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct**		Nov		Dec		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Alewife	6	T	6	0.4	2,917	41.3	4,499	71.3	7,396	89.3	1,875	49.9	73	22.5	8,730	79.8	846	41.1	325	43.2	1,518	22.1	32	0.6	28,213	48.7
American eel	3	T	10	0.6	42	0.6	14	0.2	26	0.3	26	0.7	6	1.9	20	0.2	5	0.2	6	0.8			3	T	161	0.3
Black crappie																			1	0.1	4	T	4	T	9	T
Bluegill																					29	0.4	4	T	33	T
Bluntnose minnow							21	0.3	5	T															26	T
Bowfin					1	T																			1	T
Brook stickleback					29	0.4	82	1.3	1	T															112	0.2
Brown bullhead	1	T			2	T	2	T	15	0.2	8	0.2					4	0.2	4	0.5			4	T	40	T
Brown trout	3	T											1	0.3							1	T	2	T	7	T
Burbot	1	T	1	T	1	T	3	T			1	T	16	4.9	8	T	5	0.2	1	T			2	T	39	T
Carp							1	T													1	T			2	T
Channel catfish					2	T																			2	T
Cisco (Lake Herring)																					1	T			1	T
Coho salmon	1	T																							1	T
Creek chub					2	T																			2	T
Cyprinidae	1	T																							1	T
Emerald shiner	166	3.9	38	2.4	92	1.3	2	T	3	T					1	T							12	0.2	314	0.5
Freshwater drum	1	T			1	T																			2	T
Gizzard shad	178	4.1	290	18.5	145	2.1	13	0.2			2	T			36	0.3			41	5.5	968	14.1	1,451	25.4	3,124	5.4
Golden shiner					1	T	2	T															1	T	4	T
Goldfish	1	T	1	T			2	T															1	T	5	T
Johnny darter	4	T					1	T	28	0.3	250	6.7	3	0.9	285	2.6	55	2.7	2	0.3	1	T			629	1.1
Lake chub	13	0.3	3	0.2	4	T	3	T	14	0.1	4	T									1	T	3	T	45	T
Lake trout							1	T					1	0.3							2	T	6	T	10	T
Largemouth bass											1	T									1	T			2	T
Logperch																					1	T			1	T
Longnose dace					2	T	1	T																	3	T
Mottled sculpin	320	7.4	112	7.1	147	2.1	89	1.4	59	0.7	38	1.0	19	5.9	112	1.0	42	2.0	24	3.2	101	1.5	154	2.7	1,217	2.1
Mudminnow					11	0.2	10	0.2									1	T			9	T	2	T	33	T
Northern hogsucker									1	T															1	T
Northern pike	2	T			1	T																			3	T
Pumpkinseed					1	T											2	T	3	0.4	4	T	19	0.3	29	T
Rainbow smelt	2,605	60.5	931	59.2	3,042	43.1	1,430	22.7	469	5.7	1,032	27.5	38	11.7	1,028	9.4	869	42.2	185	24.6	1,398	20.4	2,587	45.3	15,614	27.0
Rainbow trout			1	T	1	T																			2	T
Rock bass	120	2.8	25	1.6	59	0.8	10	0.2	32	0.4	56	1.5	40	12.4	14	T	6	0.3	5	0.7	3	T	41	0.7	411	T
Salmon	1	T																							1	T
Salvelinus sp.	8	0.2																							8	T
Sculpin (unidentified)													1	0.3											1	T
Sea lamprey	3	T			3	T	1	T	3	T	10	0.3	13	4.0					1	T	1	T	3	T	38	T
Smallmouth bass	7	0.2	3	0.2	15	0.2	2	T	24	0.3	51	1.4	6	1.9			1	T	2	0.3	4	T	11	0.2	126	0.2
Splake	2	T			2	T			2	T									1	T	1	T			8	T
Spottail shiner	83	1.9	9	0.6	66	0.9	19	0.3	5	T	78	2.1	8	2.5	51	0.5	42	2.0	17	2.3	202	2.9	162	2.8	742	1.3
Stonecat	3	T			3	T	4	T	3	T	10	0.3	28	8.6	2	T			7	0.9	10	T			70	T
Tadpole madtom																					2	T			2	T
Threespine stickleback	240	5.6	80	5.1	83	1.2	31	0.5	71	0.9	184	4.9	35	10.8					5	0.7	51	0.7	99	1.7	879	1.5
Trout-perch	23	0.5	2	T	30	0.4	23	0.4	82	1.0	83	2.2	7	2.2	2	T			2	0.3	9	T	17	0.3	280	0.5
White bass	279	6.5	9	0.6	34	0.5	7	T	4	T					7	T	10	0.5	30	4.0	701	10.2	347	6.1	1,428	2.5
White perch	149	3.5	46	2.9	297	4.2	27	0.4	27	0.3	28	0.7	7	2.7	561	5.1	159	7.7	37	4.9	1,733	25.2	635	11.1	3,706	6.4
White sucker	1	T	1	T	1	T	3	T	3	T	2	T	12	3.7	4	T			1	T	4	T	2	T	34	T
Yellow perch	80	1.9	4	0.3	23	0.3	7	T	4	T	15	0.4	10	3.1	79	0.7	7	0.3	41	5.5	105	1.5	108	1.9	483	0.8
Unidentified											6	0.2			4	T	4	0.2	11	1.5			1	T	26	T
Total	4,305		1,572		7,060		6,310		8,267		3,760		324		10,944		2,058		752		6,866		5,713		57,931	
No. fish/1000 m^3†	0.240		0.100		0.400		0.710†		0.860		0.210		0.017		0.500		0.103		0.043		0.362		0.301			

*January through March data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

**Traveling screens inoperable on 26 October, no sample taken

†Number per 1000 m^3 calculated from rated capacity of circulating water pump from April through June and from rated capacity of circulating and service water pumps from July through December

T = trace

[1]Species identifications of lake trout and splake and mottled and slimy sculpins are tentative because of overlapping identifying characteristics in current fish identification keys and literature

Table H-4

BIOMASS* (g) AND PERCENT COMPOSITION OF IMPINGED FISH COLLECTED AT NINE MILE POINT NUCLEAR STATION UNIT 1, JAN-DEC 1977

Species	Jan** Wt	%	Feb Wt	%	Mar Wt	%	Apr Wt	%	May Wt	%	Jun Wt	%	Jul Wt	%	Aug Wt	%	Sep Wt	%	Oct† Wt	%	Nov Wt	%	Dec Wt	%	Total Wt	%
Alewife	142.4	0.1	183.3	0.3	75,163.4	28.6	107,229.3	75.3	146,529.5	73.9	35,273.2	32.5	1,215.0	2.7	1,725.7	10.6	616.5	4.9	377.3	2.3	1,607.1	2.4	280.8	0.2	370,343.5	30.6
American eel	406.5	0.3	3,702.5	5.3	18,091.6	6.9	4,625.9	3.3	13,258.5	6.7	12,052.2	11.1	232.6	0.5	529.8	3.3	363.6	2.9	671.0	4.1			1,193.3	0.9	55,127.5	4.6
Black crappie																			0.7	T	24.3	T	25.6	T	50.6	T
Bluegill																					45.3	T	15.3	T	60.6	T
Bluntnose minnow							30.2	T	14.4	T															44.6	T
Bowfin					105.7	T																			105.7	T
Brook stickleback					38.6	T	59.3	T	0.4	T															98.3	T
Brown bullhead	46.9	T			325.3	T	127.1	T	1,605.2	0.8	768.9	0.7					255.2	2.0	288.8	1.8			30.2	T	3,447.6	0.3
Brown trout	4,338.2	3.2											3,410.0	7.4							1,259.9	1.8	3,745.4	2.8	12,753.5	1.1
Burbot	39.0	T	132.0	0.2	40.0	T	2,054.0	1.4			1,223.3	1.1	18,776.1	41.8	7,020.4	43.2	6,974.8	55.2	187.1	1.2			215.7	0.2	36,662.5	3.0
Carp							1,166.4	0.8													2,550.0	3.7			3,716.4	0.3
Channel catfish					34.1	T																			34.1	T
Cisco (Lake Herring)																					10.3	T			10.3	T
Coho salmon	643.5	0.5																							643.5	T
Creek chub					37.3	T																			37.3	T
Cyprinidae	12.0	T																							12.0	T
Emerald shiner	875.5	0.7	215.7	0.3	552.6	0.2	23.0	T	29.7	T					17.0	T							24.3	T	1,737.8	T
Freshwater drum	184.1	T			710.1	0.3																			894.2	T
Gizzard shad	32,349.7	24.0	44,189.2	62.9	80,017.5	30.5	9,581.9	6.7			583.5	0.5			51.6	0.3			4,181.1	25.8	24,439.9	35.8	96,379.0	72.2	291,773.4	24.1
Golden shiner					15.0	T	6.7	T															4.2	T	25.9	T
Goldfish	489.1	0.4	116.6	0.2			916.7	0.6															10.4	T	1,532.8	0.1
Johnny darter	12.7	T					1.7	T	85.5	T	645.9	0.6	5.0	T	264.3	1.6	4.1	T	1.3	T	1.5	T			1,022.0	T
Lake chub	194.1	T	83.2	0.1	54.1	T	134.6	T	562.1	0.3	72.9	T									22.5	T	68.9	T	1,192.4	T
Lake trout							13.2	T					1,450.0	3.2							17.8	T	41.2	T	1,522.2	T
Largemouth bass											767.1	0.7									1.8	T			768.9	T
Logperch																					5.7	T			5.7	T
Longnose dace					14.5	T	10.0	T																	24.5	T
Mottled sculpin	1,144.2	0.9	412.7	0.6	657.5	0.3	346.7	0.2	234.3	T	101.0	T	52.1	T	269.3	1.7	98.1	0.8	57.0	0.4	299.6	0.4	518.4	0.4	4,190.9	0.3
Mudminnow					54.0	T	47.7	T									6.0	T			42.4	T	19.2	T	169.3	T
Northern hogsucker									NA																NA	
Northern pike	2,652.0	2.0			47.0	T																			2,699.0	0.2
Pumpkinseed					16.8	T											2.7	T	148.6	0.9	419.9	0.6	211.2	0.2	799.2	T
Rainbow smelt	13,474.9	10.0	4,705.0	6.7	11,311.5	4.3	4,856.8	3.4	4,603.6	2.3	4,875.5	4.5	75.7	0.2	291.4	1.8	1,189.1	9.4	938.0	5.8	8,789.5	12.9	13,716.8	10.3	68,827.8	5.7
Rainbow trout			679.6	1.0	840.6	0.2																			1,520.2	T
Rock bass	44,300.0	32.9	2,946.9	4.2	8,965.1	3.4	1,772.8	1.2	6,541.5	3.3	10,410.1	9.6	6,610.1	14.4	1,639.8	10.1	737.4	5.8	660.2	4.1	439.1	0.6	3,407.9	2.6	88,430.9	7.3
Salmon	8.6	T																							8.6	T
Salvelinus sp.	88.6	T																							88.6	T
Sculpin (unidentified)													<0.1	<0.01											<0.1	T
Sea lamprey	720.8	0.5			122.4	T	217.4	0.2	568.0	0.3	1,929.9	1.8	2,313.6	5.1					189.2	1.2	190.8	0.3	339.4	0.3	6,591.5	0.5
Smallmouth bass	3,140.0	2.3	933.9	1.3	8,315.2	3.2	1,690.5	1.2	15,772.6	8.0	29,697.3	27.4	3,016.8	6.6			26.5	0.2	525.4	3.2	626.9	0.9	850.3	0.6	64,595.4	5.3
Splake	392.7	0.3			32.0	T			26.5	T									2,475.0	15.3	1,713.7	2.5			4,639.9	0.4
Spottail shiner	738.1	0.6	84.9	0.1	871.2	0.3	237.5	0.2	65.3	T	1,218.7	1.1	66.0	T	42.9	0.3	453.2	3.6	113.3	0.7	1,702.4	2.5	691.1	0.5	6,284.6	0.5
Stonecat	144.8	0.1			109.7	T	154.9	T	157.9	T	480.4	0.4	1,421.2	3.1	58.9	0.4			406.2	2.5	253.7	0.4			3,187.7	0.3
Tadpole madtom																					10.0	T			10.0	T
Threespine stickleback	424.0	0.3	134.2	0.2	140.6	T	39.9	T	153.6	T	426.5	0.4	86.6	0.2					7.4	T	58.2	T	130.6	0.1	1,601.6	T
Trout-perch	192.0	0.1	3.1	T	268.0	T	157.2	T	1,200.7	0.6	701.0	0.7	57.6	T	27.4	0.2			21.0	T	66.1	0.1	82.9	T	2,777.0	0.2
White bass	4,202.2	3.1	1,215.7	1.7	3,195.1	1.2	1,228.1	0.9	759.1	0.4					39.1	0.2	214.0	1.7	709.2	4.4	7,075.7	10.4	4,362.0	3.3	23,000.2	1.9
White perch	17,356.4	12.9	7,830.9	11.2	50,204.4	19.1	4,312.9	3.0	5,336.3	2.7	5,061.5	4.7	1,168.5	2.5	1,634.6	10.1	1,314.1	10.4	907.4	5.6	9,924.4	14.5	4,393.8	3.3	109,442.5	9.0
White sucker	257.5	0.2	1,580.1	2.3	116.2	T	957.4	0.7	696.1	0.4	1,163.9	1.1	5,114.7	11.2	705.9	4.4			1,339.2	8.3	901.4	1.3	763.2	0.6	13,595.6	1.1
Yellow perch	5,726.2	4.3	1,092.8	1.6	2,173.5	0.8	433.2	0.3	192.0	T	1,062.5	1.0	759.7	1.7	1,927.9	11.9	362.4	2.9	2,002.1	12.4	5,862.4	8.6	1,890.6	1.4	23,485.3	1.9
Unidentified											NA				NA		10.0	T	NA				NA		10.0	T
Total	134,696.7		70,242.3		262,640.6		142,433.0		198,392.8		108,515.3		45,828.8		16,246.1		12,627.7		16,206.5		68,362.3		133,411.7		1,209,603.8	

*Weight of undamaged fish in grams

**January through March data supplied by Lawler, Matusky & Skelly Engineers, Tappan, N.Y. LMS biomass values were recalculated to include only undamaged fish.

†Traveling screens inoperable on 26 October; no sample taken

T = trace

NA = not available

[1]Species identifications of lake trout and splake and mottled and slimy sculpins are tentative because of overlapping identifying characteristics in current fish identification keys and literature

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Table H-5

ESTIMATED NUMBERS AND BIOMASS* (g) OF FISH IMPINGED AT NINE MILE POINT NUCLEAR STATION UNIT 1, JAN-DEC 1977

Species	Jan** No.	Jan** Wt	Feb No.	Feb Wt	Mar No.	Mar Wt	Apr No.	Apr Wt	May No.	May Wt	Jun No.	Jun Wt	Jul No.	Jul Wt	Aug No.	Aug Wt	Sep No.	Sep Wt	Oct† No.	Oct† Wt	Nov No.	Nov Wt	Dec No.	Dec Wt	Total No.	Total Wt
Alewife	14	339.6	14	427.7	6,956	179,235.8	10,387	247,452.0	17,613	349,417.2	4,327	81,398.7	174	2,897.3	19,331	3,821.2	1,952	1,422.7	840	974.7	3,503	3,708.7	76	669.6	65,187	871,765.2
American eel	7	969.3	23	8,639.2	100	43,141.5	32	10,675.1	62	31,616.5	60	27,812.7	14	554.7	44	1,173.1	12	839.1	15	1,733.4			7	2,845.6	376	130,000.2
Black crappie																			3	1.8	9	56.1	10	61.0	22	118.9
Bluegill																					67	104.5	10	36.5	77	141.0
Bluntnose minnow							48	69.7	12	34.3															60	104.0
Bowfin					2	252.1																			2	252.1
Brook stickleback					69	92.0	187	136.8	2	1.0															258	229.8
Brown bullhead	2	111.8			5	775.7	5	293.3	36	3,827.8	18	1,774.4					9	588.9	10	746.1			10	72.0	95	8,190.0
Brown trout	7	10,344.9											2	8,131.6							2	2,907.5	5	8,931.4	16	30,315.4
Burbot	2	93.0	2	308.0	2	95.4	7	4,740.0			2	2,823.0	38	44,773.9	18	15,545.4	12	16,095.7	3	483.3			5	514.4	91	85,472.1
Carp							2	2,691.7													2	5,884.6			4	8,576.3
Channel catfish					5	81.3																			5	81.3
Cisco (Lake Herring)																					2	23.8			2	23.8
Coho salmon	2	1,534.5																							2	1,534.5
Creek chub					5	88.9																			5	88.9
Cyprinidae	2	28.6																							2	28.6
Emerald shiner	396	2,087.7	89	503.3	219	1,317.7	5	53.1	7	70.8					2	37.6							29	57.9	747	4,128.1
Freshwater drum	2	439.0			2	1,693.3																			4	2,132.3
Gizzard shad	424	77,141.6	677	103,108.1	346	190,811.0	30	22,112.1			5	1,346.5			80	114.3			106	10,801.2	2,234	56,399.7	3,460	229,827.3	7,362	691,661.8
Golden shiner					2	35.8	5	15.5															2	10.0	9	61.3
Goldfish	2	1,166.3	2	272.1			5	2,115.5															2	24.8	11	3,578.7
Johnny darter	9	30.3					2	3.9	67	203.9	577	1,490.5	7	11.9	631	585.2	127	9.5	5	3.4	2	3.5			1,427	2,342.1
Lake chub	31	462.6	7	194.1	10	129.0	7	310.6	33	1,340.4	9	168.2									2	51.9	7	164.3	106	2,821.1
Lake trout							2	30.5					2	3,457.7							5	41.3	14	98.2	23	3,627.5
Largemouth bass											2	1,770.2									2	4.2			4	1,774.4
Logperch																					2	13.2			2	13.2
Longnose dace					5	34.6	2	23.1																	7	57.7
Mottled sculpin	763	2,728.5	261	963.0	351	1,567.9	205	800.1	141	558.7	88	233.1	45	124.2	248	596.3	97	226.4	62	147.2	233	691.4	367	1,236.2	2,861	9,873.0
Mudminnow					26	128.8	23	103.2									2	13.8			21	97.8	5	45.8	77	389.4
Northern hogsucker									2	NA															2	NA
Northern pike	5	6,324.0			2	112.1																			7	6,436.1
Pumpkinseed					2	40.1											5	6.2	8	383.9	9	969.0	45	503.6	69	1,902.8
Rainbow smelt	6,212	32,132.5	2,172	10,978.3	7,254	26,973.6	3,270	11,208.0	1,118	10,977.8	2,382	11,251.1	91	180.5	2,276	645.2	2,005*	2,744.1	478	2,423.2	3,226	20,283.4	6,169	32,709.4	36,653	162,507.1
Rainbow trout			2	1,585.7	2	2,004.5																			4	3,509.2
Rock bass	286	105,638.6	58	6,876.1	141	21,378.3	23	4,091.1	76	15,599.0	129	24,023.3	95	15,762.6	31	3,631.0	14	1,701.7	13	1,705.5	7	1,013.3	98	8,126.5	971	209,547.0
Salmon	2	20.5																							2	20.5
Salvelinus sp.	19	211.3																							19	211.3
Sculpin (unidentified)													2	0.1											2	0.1
Sea lamprey	7	1,718.8			7	291.9	2	501.7	7	1,354.5	23	4,453.6	31	5,517.1					3	488.8	2	440.3	7	809.3	89	15,576.0
Smallmouth bass	17	7,487.7	7	2,179.1	36	19,828.6	5	3,901.1	57	37,611.7	118	68,532.2	14	7,193.9			2	61.2	5	1,357.3	9	1,446.7	26	2,027.6	296	151,627.1
Splake	5	936.42			5	76.3			5	63.2									3	6,393.7	2	3,954.7			20	11,424.3
Spottail shiner	198	1,760.1	21	198.1	157	2,077.5	44	549.1	12	155.7	180	2,812.4	19	157.4	113	95.0	97	1,045.8	44	292.7	466	3,928.6	386	1,648.0	1,737	14,719.4
Stonecat	7	345.3			7	261.6	9	357.5	7	376.5	23	1,108.6	67	3,389.0	4	130.4			18	1,049.3	23	585.[illegible]			165	7,603.6
Tadpole madtom																					5	23.1			5	23.1
Threespine stickleback	572	1,011.1	187	313.1	198	335.3	72	92.1	169	366.3	425	984.2	83	206.5					13	19.1	118	134.3	236	311.4	2,073	3,773.4
Trout-perch	55	457.8	5	7.2	72	639.1	53	362.8	196	2,863.2	192	1,617.7	17	137.4	4	60.7			5	54.2	21	152.5	41	197.7	661	6,550.1
White bass	665	10,020.6	21	2,836.6	81	7,619.1	16	2,834.1	10	1,810.2					15	86.6	23	493.8	77	1,832.1	1,618	16,328.5	827	10,401.7	3,353	54,263.3
White perch	355	41,388.3	107	18,272.1	708	119,718.2	62	9,952.8	64	12,725.0	65	11,680.4	37	2,780.0	1,242	3,619.5	367	3,032.5	96	2,344.3	3,999	22,902.4	1,514	10,477.5	8,596	258,892.8
White sucker	2	614.0	2	3,686.9	2	277.1	7	2,209.4	7	1,659.9	5	2,685.9	29	12,197.1	9	1,563.1			3	3,459.6	9	2,080.2	5	1,819.9	80	32,253.1
Yellow perch	191	13,654.8	9	2,549.9	55	5,183.0	16	999.7	10	457.8	35	2,451.9	24	1,811.6	175	4,268.9	16	836.3	106	5,172.1	242	13,528.6	250	4,508.4	1,137	55,423.0
Unidentified											14	NA			9	NA	9	23.1	28	NA			2	NA	62	23.1
Total	10,261	321,199.5	3,666	163,898.6	16,834	626,297.1	14,533	328,684.6	19,713	473,091.4	8,279	255,418.6	771	109,284.4	24,232	35,973.5	4,749	29,140.8	1,944	41,866.7	15,842	157,759.0	13,623	318,136.0	134,847	2,855,750.2

*Estimated weights of undamaged fish in grams

**January through March data supplied by Lawler, Matusky & Skelly Engineers, Tappan, N.Y. LMS biomass values were recalculated to include only undamaged fish.

†Traveling screens inoperable on 26 October; monthly estimate was based on all sampling dates except 26 October

‡Species identifications of lake trout and splake and mottled and slimy sculpins are tentative because of overlapping identifying characteristics in current fish identification keys and literature

Table H-6

LENGTH FREQUENCY OF FISH IMPINGED AT NINE MILE POINT POWER STATION, JAN-DEC 1977

Length Range (mm)	ALEWIFE											
	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21- 30								45	1			
31- 40								125	16			
41- 50					1			24	65	8	1	
51- 60					1			24	136	88	79	
61- 70				1		1		21	69	80	209	6
71- 80				2		3			7	8	86	9
81- 90					1	9			3	4	13	1
91-100			1	1		1			5	1	1	
101-110			1	1	2	1			3			3
111-120			3	8	4	1			1		1	
121-130			7	65	98	36	11				2	
131-140	1		76	109	292	137	14			1	4	
141-150	3	1	161	135	340	242	24				12	
151-160	1		190	173	142	95	12		1		3	2
161-170	1	3	244	245	156	103	5				3	4
171-180		1	87	72	55	28	1					
181-190			5	7	2	2					2	
191-200				1	1	2	2					
201-210												
211-220			1		1							
221-230												
231-240						1						

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

Table H-7

LENGTH FREQUENCY OF FISH IMPINGED AT NINE MILE POINT
POWER STATION, JAN-DEC 1977

Length Range (mm)	RAINBOW SMELT											
	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21- 30								5	12			
31- 40		1	1				2	45	62	2		
41- 50	15	6	8	6	1	1	1	91	48	8	2	18
51- 60	140	35	84	82	16	17	4	45	46	12	9	96
61- 70	260	161	388	230	73	72	14		33	6	54	113
71- 80	242	202	353	238	72	164	12		12	5	100	110
81- 90	181	98	337	84	52	127	1	1	3	10	117	88
91-100	36	16	68	17	3	28	1	2	1	1	43	35
101-110	17	17	29	2	1	6			2	2	11	13
111-120	16	6	19	1	3	7		1		2	15	13
121-130	20	12	22	1	9	8				3	19	24
131-140	36	9	34	7	6	7		1	7	4	34	39
141-150	74	26	48	19	29	14			6	3	26	49
151-160	77	20	46	20	32	25	1		9	7	26	51
161-170	36	19	35	22	31	14			7	6	29	39
171-180	15	7	14	15	17	11			6	2	33	29
181-190	13	7	8	6	8	4			5	6	22	24
191-200	6	3	2		7	1			1	1	14	18
201-210	2	1	1	3	2						5	6
211-220			1	1		1				1	1	
221-230						1				2	1	
231-240												
241-250					1							
251-260												1
261-270						1						
271-280						1						
281-290												
291-300												1

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

Table H-8

LENGTH FREQUENCY OF FISH IMPINGED AT NINE MILE POINT POWER STATION, JAN-DEC 1977

SMALLMOUTH BASS

Length Range (mm)	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
51- 60						1						2
61- 70						4				1	2	1
71- 80						3					1	
81- 90						2						
91-100												
101-110												
111-120												1
121-130												
131-140												1
141-150												
151-160	1											
161-170						1						
171-180			1									1
181-190						1						
191-200												
201-210												1
211-220						1						
221-230						1						
231-240		1	1		1							
241-250						1						
251-260			3			2						
261-270	1	1	1			2	2					
271-280												
281-290					3							
291-300	1		1		1	1						1
301-310						1						
311-320												
321-330						2						
331-340			1		1							1
341-350	1	1		1	1		1					
351-360					1							
361-370	1		3		3	5	1					
371-380		1	4		6	4					1	
381-390	2				1	9						
391-400						4	2					
401-410			1		4	3						
411-420												
421-430												
431-440												
441-450					1							
451-460												
461-470												
471-480												
481-490												
491-500												
501-510												
511-520						1						

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

Table H-9

LENGTH FREQUENCY OF FISH IMPINGED AT NINE MILE POINT
POWER STATION, JAN-DEC 1977

Length Range (mm)	THREESPINE STICKLEBACK											
	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21-30					1							
31-40	1			2								
41-50	30	13	14	5	6	10	2				6	25
51-60	122	38	37	13	25	47	7			2	37	63
61-70	68	26	27	11	30	64	18			2	7	8
71-80	15	3	4		9	34	7				1	
81-90												

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

Table H-10

LENGTH FREQUENCY OF FISH IMPINGED AT NINE MILE POINT POWER STATION, JAN-DEC 1977

LENGTH Range (mm)	WHITE PERCH											
	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
21- 30								2	3			
31- 40								2	5			
41- 50							1	21	9	5	18	16
51- 60	1						2	15	5	8	39	68
61- 70	2		2		1			7	7	4	31	92
71- 80	6	1	2				1	1	36	2	47	88
81- 90	8		2	1				1	16	5	66	114
91-100	9								12	5	29	49
101-110	2								7	2	7	12
111-120	4								8		2	3
121-130	1		3						5	2	1	2
131-140	6	1	6	1		2			1			1
141-150	25	8	23	2	2				3			
151-160	15	2	13	4		2				1		1
161-170	6	3	14	1	1	1						
171-180	2	2	5		1	1						
181-190	3	1	17	1			1			1		
191-200	4	1	15	2	2		1					
201-210	5	5	28	1	1	2			1			
211-220	11	5	43	3	2	1			1			
221-230	8		36	1	4	5						
231-240	5	4	25	1	5	3	1					1
241-250	2	3	17	3	1	2	2					
251-260	3	1	17	2	1		1					1
261-270	1	2	15	1	2	3	1					
271-280	3	2	6	1	2	2					1	
281-290	4	1	4		1	2						
291-300	1	1	4	1	1							
301-310	1		1									
311-320			1									
321-330	1	1	2							1		
331-340	1											
341-350	2											

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

Table H-11

LENGTH FREQUENCY OF FISH IMPINGED AT NINE MILE POINT POWER STATION, JAN-DEC 1977

YELLOW PERCH

Length Range (mm)	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
31- 40										1		
41- 50							1	1		2	2	
51- 60	1								1	4	8	
61- 70	1							2	1	3	10	8
71- 80	6								1	5	6	16
81- 90	5								1	2	6	15
91-100					1						7	18
101-110	1						1			1	8	24
111-120	1		2			1					4	10
121-130	5		3								1	6
131-140	9		4	2						1	1	
141-150	10		3	1	1	1	1	1			1	1
151-160	11			1		2		1			2	2
161-170	2		1		1	1	1			2	4	4
171-180			3			1		1		8	9	1
181-190	3					2		1	1	6	7	
191-200	3			1	1	2				3	5	1
201-210	2					2	1	1		2	9	
211-220	4		2			2	1		1	1	2	1
221-230	2		1							1	4	
231-240	4	1				1			1		2	1
241-250	1	1	1	1			1				3	
251-260	4	1					1	2			1	
261-270			2								1	1
271-280	2		1					1				
281-290	1											
291-300			1								1	
301-310												
311-320												
321-330												
331-340												
341-350												
351-360												
361-370	1											

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

Table H-12

NUMERICAL ABUNDANCE AND PERCENT COMPOSITION OF IMPINGED FISH COLLECTED AT JAMES A. FITZPATRICK NUCLEAR POWER PLANT, JAN-DEC 1977

Species	Jan*		Feb		Mar		Apr		May		Jun		Jul**		Aug†		Sep		Oct		Nov		Dec		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Alewife	23	0.3	5	0.2	3,075	53.1	18,255	67.9	45,986	91.6	4,583	66.5	2	3.1	7	10.6	1,268	60.9	6,013	44.2	1,409	11.2	33	0.3	80,659	57.0
American eel	1	T			3	T	1	T	1	T							3	T	11	T					20	T
Black bullhead																	1	T							1	T
Black crappie																	1	T	2	T	3	T	8	T	14	T
Bluegill					1	T											1	T	1	T	34	0.3	12	T	49	T
Bluntnose minnow							92	0.3	17	T															109	T
Bowfin																			1	T	3	T			4	T
Brassy minnow							13	T																	13	T
Brook stickleback					106	1.8	108	0.4	2	T															216	0.2
Brown bullhead			4	0.2	8	T	11	0.4	6	T	2	T					2	T	4	T	2	T	7	T	46	T
Brown trout	1	T	1	T									1	1.6							1	T	3	T	7	T
Burbot	9	T	4	0.2	1	T	2	T	1	T					1	1.5	1	T					7	T	26	T
Carp			2	T																					2	T
Channel catfish	2	T			1	T	1	T											1	T			3	T	8	T
Chinook salmon			1	T			1	T							1	1.5									3	T
Cisco (Lake Herring)																					1	T	4	T	5	T
Coho salmon	1	T			1	T																			2	T
Creek chub					2	T																			2	T
Cyprinidae	1	T					1	T																	2	T
Emerald shiner	266	3.3	23	1.1	77	1.3	50	0.2			2	T					2	T	5	T	11	T	42	0.3	478	0.3
Fathead minnow							11	T																	11	T
Freshwater drum	9	T																					4	T	13	T
Gizzard shad	191	2.3	317	14.6	78	1.4	118	0.4	11	T	3	T	1	1.6			35	1.7	1,056	7.8	932	7.4	1,808	14.0	4,550	3.2
Golden shiner	2	T			6	T	5	T	2	T											1	T			16	T
Goldfish	1	T	2	T	2	T															3	T	7	T	15	T
Johnny darter	5	T	4	0.2			5	T	122	0.2	77	1.1	19	29.7	39	59.1	10	0.5	29	0.2	43	0.3	12	T	365	0.3
Lake chub	7	T	7	0.3	3	T	8	T	5	T					1	1.5					4	T	6	T	41	T
Lake trout							13	T							1	1.5							14	T	28	T
Largemouth bass			1	T													1	T			1	T	1	T	4	T
Logperch																					4	T			4	T
Longnose dace	1	T	3	T	1	T																			5	T
Mottled sculpin	462	5.6	107	4.9	45	0.8	95	0.4	94	0.2	19	0.3	7	10.9	5	7.6	5	0.2	48	0.4	181	1.4	246	1.9	1,314	0.9
Mudminnow					23	0.4	32	T	1	T									1	T	13	T	10	T	80	T
Northern pike																							1	1.0	1	T
Pumpkinseed	2	T	3	T	4	T	14	T	3	T	5	T							5	T	3	T	15	T	54	T
Rainbow smelt	6,032	73.7	987	45.4	1,855	32.0	6,812	25.3	3,363	6.7	1,690	24.5	2	3.1	1	1.5	499	24.0	3,458	25.4	7,752	61.3	8,357	64.6	40,808	28.8
Rainbow trout											1	T													1	T
Rock bass	126	1.5	27	1.2	40	0.7	29	T	16	T	42	0.6	12	18.8			3	T	15	T	39	0.3	129	1.0	478	0.3
Salvelinus sp.	4	T	1	T																					5	T
Sea lamprey	4	T	3	T			1	T	2	T	1	T							1	T	1	T	5	T	18	T
Smallmouth bass	23	0.3	84	3.9	38	0.7	3	T	23	T	28	0.4	5	7.8	1	1.5			9	T	7	T	7	T	228	0.2
Splake	6	T			3	T	1	T	1	T					1	1.5									12	T
Spottail shiner	73	0.9	5	0.2	22	0.4	89	0.3	33	T	85	1.2					72	3.5	694	5.1	867	6.9	443	3.4	2,383	1.7
Stonecat	4	T	3	T	3	T	2	T	1	T			1	1.6					9	T	6	T	2	T	31	T
Tadpole madtom					1	T															14	T			15	T
Threespine stickleback	478	5.8	107	4.9	120	2.1	577	2.2	208	0.4	157	2.3	3	4.7					15	0.1	52	0.4	173	1.3	1,890	1.3
Trout-perch	20	0.2	3	T	24	0.4	157	0.6	261	0.5	173	2.5	5	7.8					8	T	6	T	4	T	661	0.5
Walleye	1	T																	1	T	4	T	2	T	8	T
White bass	241	2.9	43	2.0	23	0.4	43	0.2	3	T							52	2.5	223	1.6	442	3.5	441	3.4	1,511	1.1
White perch	86	1.1	398	18.3	174	3.0	270	1.0	30	T	16	0.2	3	4.7	1	1.5	106	5.1	1,868	13.7	755	6.0	979	7.6	4,686	3.3
White sucker	3	T	2	T	1	T			1	T	3	T	1	1.6	2	3.0			2	T	7	T	7	T	29	T
Yellow perch	104	1.3	24	1.1	53	0.9	59	0.2	15	T	7	T	2	3.1	5	7.6	20	1.0	119	0.9	40	0.3	138	1.1	586	0.4
Unidentified			1	T	1	T	1	T	1	T									1	T	1	T			6	T
Total	8,189		2,172		5,794		26,881		50,209		6,894		64		66		2,082		13,600		12,642		12,930		141,523	
No. fish/1000 m^3	0.31		0.12		0.23		1.08‡		2.07		0.34		0.007		0.008		0.418		0.546		0.512		0.493			

**January through March data supplied by Lawler, Matusky & Skelly Engineers, Tappan, N.Y. LMS biomass values were recalculated to include only undamaged fish.

**Traveling screens inoperable from 0500 to 0500 on July 6-7. No fish were collected during this period.

†Traveling screens inoperable from 22 August-21 September. No samples were taken during this period.

‡Number per 1000 m^3 calculated using rated capacity of circulating water pumps from April through June. Calculated using rated capacity of circulating and service water pumps from July through December.

T = trace

[1] Species identifications of lake trout and splake and mottled and slimy sculpins are tentative because of overlapping identifying characteristics in current fish identification keys and literature

Table H-13

BIOMASS* (g) AND PERCENT COMPOSITION OF IMPINGED FISH COLLECTED AT JAMES A. FITZPATRICK NUCLEAR POWER PLANT, JAN-DEC 1977

Species	Jan** Wt	Jan** %	Feb Wt	Feb %	Mar Wt	Mar %	Apr Wt	Apr %	May Wt	May %	Jun Wt	Jun %	Jul† Wt	Jul† %	Aug‡ Wt	Aug‡ %	Sep Wt	Sep %	Oct Wt	Oct %	Nov Wt	Nov %	Dec Wt	Dec %	Total Wt	Total %
Alewife	505.2	0.4	78.5	T	81,912.8	39.0	416,316.9	72.8	919,720.0	94.4	88,577.7	63.1	28.8	0.3	0.5	T	773.6	11.1	7,253.8	13.8	2,909.5	4.4	295.8	T	1,518,378.5	56.6
American eel	86.9	T			4,415.2	2.1			1,485.1	0.2							232.7	3.4	349.2	0.7					6,569.1	0.2
Black bullhead																	8.3	T							8.3	T
Black crappie																	8.7	T	3.2	T	12.9	T	15.3	T	40.1	T
Bluegill					104.3	T											1.7	T	1.6	T	43.3	T	19.7	T	170.6	T
Bluntnose minnow							204.3	T	34.2	T															238.5	T
Bowfin																			37.2	T	179.7	0.3			216.9	T
Brassy minnow							21.4	T																	21.4	T
Brook stickleback					108.4	T	97.0	T	0.8	T															206.2	T
Brown bullhead			364.4	0.2	1,091.3	0.5	1,557.1	0.3	1,119.3	T	214.6	0.2					203.5	2.9	203.4	0.4	5.1	T	61.2	T	4,819.9	0.2
Brown trout	1,472.9	1.3	1,305.2	0.6									590.3	5.7							2,425.0	3.7	7,400.0	2.3	13,193.4	0.5
Burbot	1,139.2	1.0	4,247.1	2.0	65.0	T	3,867.8	0.7	1,074.9	T					999.2	35.7	1.1	T					4,303.3	1.4	15,697.6	0.6
Carp			4,950.0	2.3																					4,950.0	0.2
Channel catfish	60.4	T			15.5	T	17.1	T											3.8	T			5.7	T	102.5	T
Chinook salmon			1,960.0	0.9			422.4	T							187.9	6.7									2,570.3	T
Cisco (Lake Herring)																					50.9	T	155.1	T	206.0	T
Coho salmon	2,625.0	2.2			1,509.8	0.7																			4,134.8	0.2
Creek chub					74.3	T																			74.3	T
Cyprinidae	2.5	T					0.8	T																	3.3	T
Emerald shiner	1,125.6	1.0	124.8	T	287.3	T	244.9	T			27.7	T					2.5	T	2.8	T	56.7	T	92.2	T	1,964.5	T
Fathead minnow							22.4	T																	22.4	T
Freshwater drum	329.9	0.3																					43.3	T	373.2	T
Gizzard shad	45,205.1	38.5	50,730.0	24.0	36,995.8	17.6	63,651.3	11.1	5,849.2	0.6	1,228.9	0.9	592.0	5.7			147.7	2.1	7,982.0	15.2	14,083.9	21.4	130,910.6	41.0	357,376.5	13.3
Golden shiner	60.2	T			35.4	T	40.5	T	13.0	T											3.8	T			152.9	T
Goldfish	376.7	0.3	543.4	0.3	1,057.5	0.5															42.6	T	82.7	T	2,102.9	T
Johnny darter	11.4	T	12.1	T			10.0	T	373.2	T	179.7	T	30.1	0.3	8.4	0.3	3.7	T	28.1	T	37.5	T	16.4	T	710.6	T
Lake chub	128.6	T	67.7	T	141.5	T	352.6	T	138.3	T					124.1	4.4					15.9	T	21.4	T	990.1	T
Lake trout							172.8	T							76.7	2.7							79.9	T	329.4	T
Largemouth bass			224.9	T													19.3	0.3			3.0	T	2.7	T	249.9	T
Logperch																					16.4	T			16.4	T
Longnose dace	6.7	T	23.6	T	8.9	T																			39.2	T
Mottled sculpin	1,401.9	1.2	426.4	0.2	210.1	T	582.4	T	348.8	T	81.7	T	17.6	0.2	9.5	0.3	6.8	T	67.5	T	483.9	0.7	670.8	0.2	4,307.4	0.2
Mudminnow					103.3	T	101.3	T	2.4	T									4.4	T	56.8	T	86.6	T	354.8	T
Northern pike																							715.2	0.2	715.2	T
Pumpkinseed	190.3	0.2	282.2	T	358.7	0.2	798.0	T	193.1	T	287.6	0.2							6.8	T	131.9	0.2	128.9	T	2,377.5	T
Rainbow smelt	17,358.0	14.8	4,301.5	2.0	12,606.7	6.0	39,735.9	7.0	18,551.7	1.9	10,770.8	7.7	22.2	0.2	0.3	T	1,670.6	24.1	10,478.5	19.9	23,421.3	35.6	28,814.2	9.0	167,731.7	6.3
Rainbow trout											1,020.9	0.7													1,020.9	T
Rock bass	12,799.0	10.9	4,643.3	2.2	5,956.7	2.8	3,131.4	0.6	4,008.6	0.4	10,199.4	7.3	3,305.7	31.9			558.5	8.0	479.1	0.9	4,669.0	7.1	25,038.6	7.8	74,789.3	2.8
Salvelinus sp.	43.0	T	7.1	T																					50.1	T
Sea lamprey	1,040.2	0.9	261.0	T			29.0	T	236.6	T	328.1	0.2							NA		248.4	0.4	2,102.0	0.7	4,245.3	0.2
Smallmouth bass	11,030.3	9.4	54,176.8	25.6	25,849.2	12.3	1,357.0	0.2	9,697.3	1.0	16,542.9	11.8	4,545.7	43.9	541.1	19.3			612.2	1.2	1,835.5	2.8	105.5	T	126,293.5	4.7
Splake	80.6	T			43.2	T	18.0	T	11.0	T					NA										152.8	T
Spottail shiner	600.6	0.5	46.9	T	191.2	T	1,069.2	0.2	472.2	T	1,241.9	0.9					270.1	3.9	2,922.2	5.6	2,756.3	4.2	1,473.4	0.5	11,044.0	0.4
Stonecat	298.0	0.3	213.8	T	193.7	T	134.8	T	11.0	T			90.2	0.9					426.8	0.8	174.7	0.3	3.5	T	1,546.5	T
Tadpole madtom							3.6	T													36.2	T			39.8	T
Threespine stickleback	849.0	0.7	174.5	T	186.8	T	1,103.9	0.2	360.3	T	309.8	0.2	6.6	T					23.5	T	54.6	T	241.6	T	3,310.6	T
Trout-perch	115.8	T	6.3	T	130.0	T	1,572.9	0.3	3,066.2	0.3	2,181.9	1.6	91.7	0.9					35.4	T	34.9	T	15.5	T	7,250.6	0.3
Walleye	65.0	T																	4.7	T	23.0	T	19.3	T	112.0	T
White bass	3,212.0	2.7	10,034.3	4.7	1,364.2	0.7	3,193.3	0.6	267.2	T							726.4	10.5	3,823.6	7.3	4,888.4	7.4	14,113.4	4.4	41,622.9	1.6
White perch	7,627.4	6.5	69,557.1	32.9	29,595.1	14.1	25,788.2	4.5	4,850.0	0.5	3,857.7	2.8	435.8	4.2	0.9	T	1,234.5	17.8	13,753.1	26.1	4,023.7	6.1	99,804.2	31.2	260,527.7	9.7
White sucker	2,761.8	2.4	921.9	0.4	841.2	0.4			938.1	T	2,374.1	1.7	148.9	1.4	664.3	23.7			783.8	1.5	178.8	0.3	106.6	T	9,719.5	0.4
Yellow perch	4,807.2	4.1	1,908.3	0.9	4,653.9	2.2	6,263.9	1.1	1,302.5	T	890.2	0.6	459.3	4.4	184.8	6.6	1,073.6	15.5	3,355.9	6.4	2,803.9	4.3	2,649.5	0.8	30,353.0	1.1
Unidentified			22.5	T	1.5	T	43.0	T	3.1	T									NA		NA				70.1	T
Total	117,416.4		211,615.6		210,113.9		571,925.1		974,128.1		140,315.6		10,364.9		2,797.7		6,943.3		52,642.6		65,707.5		319,594.1		2,683,564.8	

*Weight of undamaged in grams

**January through March data supplied by Lawler, Matusky & Skelly Engineers, Tappan, N.Y. LMS biomass values were recalculated to include only undamaged fish.

†Traveling screens inoperable from 0500 to 0500 on July 6-7. No fish were collected during this period

‡Traveling screens were inoperable from 22 August-21 September. No samples were taken during this period

NA = not available
T = trace

1 Species identifications of lake trout and splake and mottled and slimy sculpins are tentative because of overlapping identifying characteristics in current fish identification keys and literature

Table H-14

ESTIMATED NUMBERS AND BIOMASS* (g) OF IMPINGED FISH COLLECTED AT JAMES A. FITZPATRICK NUCLEAR POWER PLANT, JAN-DEC 1977

Species	Jan**		Feb		Mar		Apr		May		Jun		Jul†		Aug††		Sep		Oct		Nov		Dec		Total	
	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt	No.	Wt
Alewife	55	1,204.7	12	183.2	7,333	195,343.4	30,588	960,731.3	109,659	2,193,182.7	10,576	204,409.9	5	68.7	24	1.7	9,510	5,802.0	14,339	17,297.6	3,252	6,714.2	79	705.4	185,432	3,585,644.8
American eel	2	207.2			7	10,528.6	2	NA	2	3,541.4							23	1,745.3	26	832.7					62	16,855.2
Black bullhead																	8	62.3							8	62.3
Black crappie																	8	65.3	5	7.6	7	29.8	19	36.5	39	139.2
Bluegill					2	248.7											8	12.8	2	3.8	78	99.9	29	47.0	119	412.2
Bluntnose minnow							212	471.5	41	81.6															253	553.1
Bowfin																			2	88.7	7	414.7			9	503.4
Brassy minnow					30	49.4																			30	49.4
Brook stickleback					253	258.5	249	223.8	5	1.9															507	484.2
Brown bullhead			9	850.3	19	2,602.3	25	3,593.3	14	2,669.1	5	495.2					15	1,526.3	10	485.0	5	11.8	17	145.9	119	12,379.2
Brown trout	2	3,512.3	2	3,045.5									2	1,407.6							2	5,596.1	7	17,646.2	15	31,207.7
Burbot	21	2,716.6	9	9,909.9	2	155.0	5	8,925.7	2	2,563.2					3	3,441.7	8	8.3					17	10,261.7	67	37,982.1
Carp			5	11,550.0																					5	11,550.0
Channel catfish	5	144.0			2	37.0	2	39.5											2	9.1			7	13.6	18	243.2
Chinook salmon			2	4,573.3			2	974.8							3	647.2									7	6,195.3
Cisco (Lake Herring)																					2	117.5	10	369.9	12	487.4
Coho salmon	2	6,259.6			2	3,600.3																			4	9,859.9
Creek chub					5	177.2																			5	177.2
Cyprinidae	2	6.0					2	1.8																	4	7.8
Emerald shiner	634	2,684.1	54	291.2	184	685.1	115	565.2			5	63.9					15	18.8	12	6.7	25	130.8	100	219.9	1,144	4,665.7
Fathead minnow							25	51.7																	25	51.7
Freshwater drum	21	786.7																					10	103.3	31	890.0
Gizzard shad	455	107,796.8	740	118,370.0	186	88,220.8	272	146,887.5	26	13,948.1	7	2,835.9	2	1,411.7			263	1,107.8	2,518	19,034.0	2,151	32,501.3.	4,311	312,172.0	10,931	844,285.9
Golden shiner	5	143.6			14	84.4	12	93.5	5	31.0											2	8.8			38	361.3
Goldfish	2	898.3	5	1,267.9	5	2,521.7															7	98.3	17	197.2	36	4,983.4
Johnny darter	12	27.2	9	28.2			12	23.1	291	889.9	178	414.7	45	71.8	134	28.9	75	27.8	69	67.0	99	86.5	29	39.1	953	1,704.2
Lake chub	17	306.7	16	158.0	7	337.4	18	813.7	12	329.8					3	427.5					9	36.7	14	51.0	96	2,460.8
Lake trout							30	398.8							3	264.2							33	190.5	66	853.5
Largemouth bass			2	524.8													8	144.8			2	6.9	2	6.4	14	682.9
Logperch																					9	37.8			9	37.8
Longnose dace	2	16.0	7	55.1	2	21.2																			11	92.3
Mottled sculpin	1,102	3,343.0	250	994.9	107	501.0	219	1,344.0	224	831.8	44	188.5	17	42.0	17	32.7	38	51.0	114	161.0	418	1,116.7	587	1,599.6	3,137	10,206.2
Mudminnow					55	246.3	74	233.8	2	5.7									2	10.5	30	131.1	24	206.5	187	833.9
Northern pike																							2	1,705.5	2	1,705.5
Pumpkinseed	5	453.8	7	658.5	10	855.4	32	1,841.5	7	460.5	12	663.7							12	16.2	7	304.4	36	307.4	128	5,561.4
Rainbow smelt	14,364	41,392.2	2,303	10,036.8	4,423	30,062.1	15,720	91,698.1	8,019	44,238.8	3,900	24,855.7	5	52.9	3	1.0	3,743	12,529.5	8,246	24,987.2	17,889	54,049.1	19,928	68,710.9	98,563	402,614.3
Rainbow trout											2	2,355.9													2	2,355.9
Rock bass	300	30,520.7	63	10,834.4	95	14,204.4	67	7,226.3	38	9,559.0	97	23,537.1	29	7,882.8			23	4,188.8	36	1,142.5	90	10,774.6	308	59,707.5	1,146	179,578.1
Salvelinus sp.	10	102.5	2	16.6																					10	70.6
Sea lamprey	10	2,480.5	7	609.0			2	66.9	5	564.2	2	757.2							2	NA	2	573.2	12	5,012.5	42	10,063.5
Smallmouth bass	55	26,303.0	196	126,412.5	91	61,640.4	7	3,131.5	55	23,124.4	65	38,175.9	12	10,839.8	3	1,863.8			21	1,459.9	16	4,235.8	17	251.6	538	297,438.6
Splake	14	192.2			7	103.0	2	41.5	2	NA					3	NA									28	336.7
Spottail shiner	174	1,432.2	12	109.4	52	455.9	205	2,467.4	79	1,126.0	196	2,865.9					540	2,025.8	1,655	6,968.3	2,001	6,360.7	1,056	3,513.5	5,970	27,325.1
Stonecat	10	710.6	7	498.9	7	461.9	5	311.1	2	26.2			2	215.1					21	1,017.8	14	403.2	5	8.3	73	3,653.1
Tadpole madtom					2	8.3															32	83.5			34	91.8
Threespine stickleback	1,140	2,024.5	250	407.2	286	445.4	1,332	2,547.5	496	859.2	362	714.9	7						36	56.0	120	126.0	413	576.1	4,442	7,772.5
Trout-perch	48	276.1	7	14.7	57	310.0	362	3,629.8	622	7,311.7	399	5,035.1	12						19	84.4	14	80.5	10	37.0	1,550	16,998.0
Walleye	2	155.0																	2	11.2	9	53.1	5	46.0	18	265.3
White bass	575	7,659.4	100	23,413.4	55	3,253.1	99	7,369.1	7	635.5							390	5,448.0	532	9,117.8	1,020	11,280.9	1,052	33,655.1	3,830	101,832.3
White perch	205	18,188.4	929	162,299.9	415	70,572.9	623	59,511.2	72	11,565.4	37	8,902.4	7	1,039.2	3	3.1	795	9,258.8	4,454	32,795.9	1,742	9,285.5	2,335	237,995.1	11,617	621,417.8
White sucker	7	6,585.8	5	2,151.1	2	2,005.9			2	2,237.0	7	5,478.7	2	355.1	7	2,288.1			5	1,869.1	16	412.6	17	254.2	70	23,637.6
Yellow perch	248	11,463.3	56	4,452.7	126	11,097.8	136	14,455.1	36	3,106.0	16	2,054.3	5	1,095.3	17	636.5	150	8,052.0	284	8,002.5	92	6,470.5	329	6,318.1	1,495	77,204.1
Unidentified			2	52.5	2	3.6	2	99.2											2	NA	2	NA			10	155.3
Total	19,526	279,993.0	5,068	493,769.9	13,813	501,040.7	50,490	1,319,826.9	119,725	2,322,890.1	15,910	323,804.9	152	24,716.4	223	9,636.5	15,620	52,075.4	32,428	125,532.5	29,171	151,632.5	30,837	762,110.5	332,963	6,367,029.3

*Estimated weights of undamaged fish in grams

**January through March data supplied by Lawler, Matusky & Skelly Engineers, Tappan, N.Y. LMS biomass values were recalculated to include only undamaged fish.

†Traveling screen inoperable from 0500-0500 on July 6-7. No fish were collected during this period.

††Traveling screens inoperable from 22 August-21 September. No samples were taken during this period.

NA = not available

[1]Species identifications of lake trout and splake and mottled and slimy sculpins are tentative because of overlapping identifying characteristics in current fish identification keys and literature

Table H-15

LENGTH FREQUENCY OF FISH IMPINGED AT JAMES A. FITZPATRICK POWER STATION, JAN-DEC 1977

ALEWIFE

Length Range (mm)	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug**	Sep	Oct	Nov	Dec
21- 30										1		
31- 40												
41- 50									14	39	6	2
51- 60				2					75	224	156	2
61- 70				3					27	113	223	2
71- 80		1		2	2				5	22	70	3
81- 90	1	1		1	2	3				2	7	2
91-100				1	1	1				1	1	2
101-110				1						1	1	
111-120				3	4	3				1		
121-130			4	34	68	30				2		
131-140	2		29	118	226	116	1			1	2	
141-150	8		76	173	306	214	1			2	2	
151-160	6	1	90	226	132	94				1	1	
161-170	2	1	210	328	149	101			1	1	2	1
171-180	1		76	115	56	35				1		
181-190			9	11	8	3					3	
191-200					1						2	
201-210				2	1							
211-220												
221-230					1							

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

**Traveling screens inoperable from 22 Aug through 21 Sep.

Table H-16

LENGTH FREQUENCY OF FISH IMPINGED AT JAMES A. FITZPATRICK POWER STATION, JAN-DEC 1977

Length Range (mm)	RAINBOW SMELT											
	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug**	Sep	Oct	Nov	Dec
21- 30					1	1						
31- 40										3		
41- 50	27	5	11	2	1			1	1	45	16	17
51- 60	203	54	70	37	13	5			17	75	54	139
61- 70	241	134	235	172	90	32			31	76	116	188
71- 80	205	197	199	288	283	130			20	71	122	177
81- 90	109	83	100	165	236	162			8	65	81	107
91-100	31	19	14	28	54	50			7	10	37	17
101-110	6	2	7	11	13	25			7	2	15	8
111-120	4	4	5	16	11	14			14	4	14	9
121-130	14	5	6	17	18	20			20	5	14	14
131-140	23	11	11	33	30	13			14	5	15	27
141-150	24	20	21	56	45	21			10	9	16	22
151-160	32	25	49	91	60	44			7	8	25	34
161-170	28	18	38	82	46	27			4	8	22	25
171-180	6	11	17	49	23	14	1		5	12	19	10
181-190	4		4	24	20	14				12	21	11
191-200	2	2	3	11	8	5			1	3	7	7
201-210	1	2		1	2	3				1	5	2
211-220	1	1			2	1					2	1
221-230		2	1	5	1	1						
231-240						1						
241-250			1	2								
251-260					1							
261-270												1

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

**Traveling screens inoperable from 22 Aug through 21 Sep.

Table H-17

LENGTH FREQUENCY OF FISH IMPINGED AT JAMES A. FITZPATRICK POWER STATION, JAN-DEC 1977

Length Range (mm)	SMALLMOUTH BASS											
	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug**	Sep	Oct	Nov	Dec
21- 30					1							
31- 40										2		
41- 50										1	1	
51- 60										2	1	
61- 70											1	1
71- 80										1		1
81- 90										2		
91-100												
101-110												
111-120												
121-130	1	1										
131-140					2							
141-150		1	1									
151-160	2					1						
161-170			1		2							
171-180	1	3	2		2	1						
181-190	1	1			1	1						1
191-200	1											
201-210												
211-220				1								
221-230		1										
231-240		1	1									
241-250	4											
251-260	1		1		1	1						
261-270		1	2	1	1	1						
271-280		4	1			2						
281-290		1	1		1						1	
291-300		2										
301-310		5	1		1							
311-320	1	2										
321-330		2			2							
331-340		2	1									
341-350	1	2										
351-360	1	1	2		1	2						
361-370	2	7	2		4	1		1				
371-380		6	3		1	3						
381-390		10	10		1	2	1					
391-400	3	12	5			2						
401-410		5	1			3	2					
411-420	1	1	1			1	2				1	
421-430	1	1	2		1							
431-440												

* Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

**Traveling screens inoperable from 22 Aug through 21 Sep.

Table H-18

LENGTH FREQUENCY OF FISH IMPINGED AT JAMES A. FITZPATRICK POWER STATION, JAN-DEC 1977

THREESPINE STICKLEBACK

Length Range (mm)	Jan *	Feb	Mar	Apr	May	Jun	Jul	Aug**	Sep	Oct	Nov	Dec
21- 30												
31- 40	3		1	1							1	1
41- 50	62	21	36	61	17	18					11	62
51- 60	186	46	43	149	70	60	1			3	25	88
61- 70	122	32	34	141	54	58	2			5	2	7
71- 80	9	1	6	8	6	13				1	1	1
81- 90				1								
91-100												

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

**Traveling screens inoperable from 22 Aug through 21 Sep.

Table H-19

LENGTH FREQUENCY OF FISH IMPINGED AT JAMES A. FITZPATRICK POWER STATION, JAN-DEC 1977

Length Range (mm)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug**	Sep	Oct	Nov	Dec
					WHITE PERCH							
31- 40									2	8		2
41- 50							1		19	34	37	31
51- 60	1								5	20	53	73
61- 70	6		2	1					15	14	67	75
71- 80	5		2	1					21	11	30	48
81- 90	7		2	3					11	19	32	53
91-100	12		1	1					5	22	11	21
101-110	1			1					1	11	6	10
111-120	1		1	4	1					9		4
121-130			1	16	2					1		2
131-140	1		5	14	1	1				1	1	1
141-150	6		7	34								
151-160	3	1	14	39	3	1					1	
161-170	5	1	3	15	2					1		
171-180	6	5	3	15	2							
181-190	1	4	2	6								
191-200	4	10	6	4	1		1		1			
201-210	8	13	15	4						1		
211-220	4	14	11	6	2	1					1	3
221-230	2	11	16	10	1						1	12
231-240	6	13	10	6	1							14
241-250		10	4	8	2	2			1	1		7
251-260	2	2	11	4	2	2					1	7
261-270	1	4	3	3	2							7
271-280	1	7	5	4	4	1	1					5
281-290		1	2	1	1	1						4
291-300	1	1		1								
301-310			1						1			
311-320		2										
321-330			1									
331-340												1
341-350			2									1
351-360												
361-370				1								

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.
**Traveling screens inoperable from 22 Aug through 21 Sep.

Table H-20

LENGTH FREQUENCY OF FISH IMPINGED AT JAMES A. FITZPATRICK POWER STATION, JAN-DEC 1977

YELLOW PERCH

Length Range (mm)	Jan*	Feb	Mar	Apr	May	Jun	Jul	Aug**	Sep	Oct	Nov	Dec
41- 50										2		
51- 60									2			1
61- 70	7								2	3	1	3
71- 80	14				1				3	8	1	14
81- 90	4								3	13	3	20
91-100	2									4	1	20
101-110			1		1				1	9		17
111-120	4					1				4	1	6
121-130	13			4						4		2
131-140	8	3	1	5						3		1
141-150	10	2	8	8					1	3		2
151-160	10	1	1	4	2					2	3	1
161-170	4	5	4	2	2					6	1	
171-180	5	5	5	5	1	1			1	3	6	1
181-190	4	1	8	5	2				1		2	1
191-200	4	2	8	3	3				1	4		1
201-210	3	1	6	4						3	2	1
211-220	3		3	2	1		1			1	3	1
221-230	3			4					1	1	2	
231-240		1	3	2	1	1			1			
241-250				1		1						
251-260			1		1						1	
261-270		1	1			1		1		1		
271-280	2		1	2								
281-290							1					1
291-300		1		1								
301-310												
311-320												
321-330				1								

*Jan-Mar data supplied by Lawler, Matusky, & Skelly Engineers, Tappan, N.Y.

**Traveling screens inoperable from 22 Aug through 21 Sep.

Table H-21

WINTER AGE CLASS DISTRIBUTION OF ALEWIFE AND RAINBOW SMELT FROM IMPINGEMENT COLLECTIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT - 1977

I. ALEWIFE (9 males and 25 females collected 12 Jan - 31 Mar)

AGE CLASS	MALES			FEMALES		
	% FREQUENCY	TOTAL LENGTH (cm) MEAN	TOTAL LENGTH (cm) RANGE	% FREQUENCY	TOTAL LENGTH (cm) MEAN	TOTAL LENGTH (cm) RANGE
I	0	-	-	0	-	-
II	0	-	-	0	-	-
III	11.11	16.5	-	8.00	15.5	14.7 - 15.6
IV	88.89	15.22	14.3 - 16.4	44.00	16.18	15.1 - 17.2
V	0	-	-	44.00	16.62	15.8 - 17.4
VI	0	-	-	4.00	6.8	-

II. RAINBOW SMELT (31 males and 29 females collected 5 Jan-24 Mar)

AGE CLASS	MALES			FEMALES		
	% FREQUENCY	TOTAL LENGTH (cm) MEAN	TOTAL LENGTH (cm) RANGE	% FREQUENCY	TOTAL LENGTH (cm) MEAN	TOTAL LENGTH (cm) RANGE
I	0	-	-	0	-	-
II	51.61	13.93	11.4 - 16.3	24.14	14.73	12.4 - 17.2
III	35.48	16.14	14.7 - 17.5	44.83	16.35	14.6 - 18.5
IV	9.68	16.23	15.6 - 17.0	20.69	17.97	16.2 - 21.3
V	3.23	16.00	-	10.34	21.77	20.0 - 22.8
VI	0	-	-	0	-	-

*Age class data for the winter season (Jan-Mar) as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table H-22

AGE CLASS DISTRIBUTION OF ALEWIFE AND RAINBOW SMELT IMPINGED DURING SPRING (APR-JUN) AT JAMES A. FITZPATRICK NUCLEAR POWER STATION, 1977

ALEWIFE

		Total Length (mm)*	
Age Class	No.	Mean	Range
0	0		
I	0		
II	2	130.0	129-131
III	5	148.0	132-167
IV	10	147.5	133-174
V	5	166.2	144-188

*Sex of alewife could not be determined during spring.

RAINBOW SMELT

	Male			Female		
		Total Length (mm)			Total Length (mm)	
Age Class	No.	Mean	Range	No.	Mean	Range
0	0			0		
I	0			1	136.0	—
II	2	98.5	97-100	4	130.0	99-152
III	4	157.8	155-165	8	164.5	100-202
IV	1	186.0	—	4	169.8	158-194

Table H-23

AGE CLASS DISTRIBUTION OF ALEWIFE AND ROCK BASS IMPINGED DURING SUMMER (JUL-SEP) AT JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

ALEWIFE

	Male	Total Length (mm)		Female	Total Length (mm)	
Age Class	No.	Mean	Range	No.	Mean	Range
0*	15	80.3	66-115	0		
I	0			0		
II	1	127.0	–	1	170.0	–
III	2	152.5	130-175	1	166.0	–

*Sex could not be determined for Age 0 Fish.

ROCK BASS

	Male	Total Length (mm)		Female	Total Length (mm)		Undetermined Sex	Total Length (mm)	
Age Class	No.	Mean	Range	No.	Mean	Range	No.	Mean	Range
0	0			0			7	57.3	50-62
I	0			0			0		
II	2	151.0	132-170	0			6	133.0	119-150
III	0			0			2	180.5	180-181
IV	2	181.0	169-193	1	213.0	–	2	155.0	152-158
V	0			1	212.0	–	0		
VI	0			0			0		
VII	0			1	235.0	–	0		
VIII	0			1	250.0	–	0		

*Sex could not be determined for Age 0 Fish.

Table H-24

AGE CLASS DISTRIBUTION OF ALEWIFE AND RAINBOW SMELT IMPINGED DURING FALL (OCT-DEC) AT JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

ALEWIFE

	Male	Total Length (mm)		Female	Total Length (mm)	
Age Class	No.	Mean	Range	No.	Mean	Range
0*	10	87.9	65-106	0		
I	0			0		
II	1	145.0	—	1	186.0	--
III	1	140.0	—	3	159.3	135-190
IV	3	173.7	165-190	4	156.3	143-185

*Sex could not be determined for Age 0 fish.

RAINBOW SMELT

	Male	Total Length (mm)		Female	Total Length (mm)	
Age Class	No.	Mean	Range	No.	Mean	Range
0	1	123.0	—	2	113.5	110-117
I	3	148.7	132-160	1	155.0	
II	2	152.0	139-165	5	154.4	142-161
III	3	172.3	154-182	6	185.8	16[illegible]-211
IV	2	197.5	187-208	2	199.5	19[illegible]-208

Table H-25

FECUNDITY OF SELECTED FISH SPECIES COLLECTED IN JAMES A. FITZPATRICK IMPINGEMENT SAMPLES DURING 1977

White Perch

Total Length (mm)	Weight (g)	Yolk Eggs (no.)
200	132.3	27,577
214	130.3	49,018
222	149.9	41,820
264	268.9	41,733
266	317.1	74,334
280	395.7	131,705
280	371.5	179,573
285	378.6	105,726
288	323.1	63,615

Smallmouth Bass

Total Length (mm)	Weight (g)	Yolk Eggs (no.)
335	516.5	5,387
355	592.3	9,329
356	611.4	9,441
368	657.0	10,851
368	691.2	10,012
370	771.7	5,808
378	841.3	19,212
385	927.5	26,385
390	857.1	16,982
393	1000.0	12,436
400	877.2	7,835
404	1025.0	13,048

Rainbow Smelt

Total Length (mm)	Weight (g)	Yolk Eggs (no.)
160	22.0	19,907
187	38.8	20,983

Yellow Perch

Total Length (mm)	Weight (g)	Yolk Eggs (no.)
190	94.0	11,464
199	99.6	15,086
208	122.3	19,338
215	140.1	16,507
231	177.7	22,877
275	376.9	86,297

APPENDIX J

ENTRAINMENT AND VIABILITY

- James A. FitzPatrick
  - Phytoplankton
  - Zooplankton

Table J-1

CHLOROPHYLL *a* CONCENTRATIONS[a] IN WHOLE WATER COLLECTIONS AFTER 7-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977*

DATE	DAY[b] NIGHT[c]	INTAKE[d] TEMP.(C)	ΔT[e]	INTAKE R-1	INTAKE R-2	INTAKE MEAN	DISCHARGE R-1	DISCHARGE R-2	DISCHARGE MEAN	3 C SIMULATION R-1	3 C SIMULATION R-2	3 C SIMULATION MEAN	2 C SIMULATION R-1	2 C SIMULATION R-2	2 C SIMULATION MEAN
5 JAN	1020	2.5	17.7	5.6	5.1	5.35	5.1	5.7	5.40	3.5	4.0	3.75	5.1	4.7	4.90
	2115	2.1	18.4	4.4	4.0	4.20	4.0	4.2	4.10	4.2	4.9	4.55	4.2	5.1	4.65
19 JAN	1002	1.1	17.8	2.1	1.9	2.00	2.3	2.1	2.20	1.9	2.3	2.10	3.7	3.3	3.50
	2121	1.0	17.2	2.3	2.6	2.45	3.0	2.6	2.80	3.0	2.8	2.90	2.6	2.3	2.45
7 FEB	1034	3.9	12.2	2.3	2.1	2.20	1.9	2.1	2.00	1.9	2.3	2.10	1.9	2.1	2.00
	2105	1.3	18.3	1.6	2.1	1.85	1.2	1.6	1.40	1.0	1.2	1.10	1.2	0.9	1.05
16 FEB	1015	1.8	19.9	1.6	1.2	1.40	1.2	1.4	1.30	1.4	1.2	1.30	1.2	0.9	1.05
	2045	2.5	19.0	1.4	1.4	1.40	1.6	1.6	1.60	1.4	1.4	1.40	1.2	1.4	1.30
7 MAR	0953	6.3	14.9	2.6	2.1	2.35	2.3	2.8	2.55	2.6	2.1	2.35	2.1	2.1	2.10
	2047	2.3	11.3	5.8	6.3	6.05	6.1	6.3	6.20	6.5	5.6	6.05	6.3	5.4	5.85
21 MAR	0950	1.0	18.2	4.4	6.8	5.60	6.5	6.3	6.40	7.0	6.5	6.75	5.1	5.6	5.35
	1950	1.3	17.5	4.4	3.7	4.05	3.7	3.5	3.60	4.4	3.5	3.95	4.4	4.0	4.20

[a] μg/liter
[b] Time in 2400 hrs.
[c] Time in 2400 hrs.
[d] Intake temperature before tempering.
[e] Discharge minus intake temperature.
*Viability data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-2

CHLOROPHYLL *a* CONCENTRATIONS[#] IN WHOLE WATER COLLECTIONS AFTER 7-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
19 Apr	1320	3.0	15.0	1.95	0.81	<0.10	0.00	0.05	2.02	0.06	1.04	2.04	0.11	1.05
19 Apr	2330	3.1	14.4	1.32	0.08	1.01	0.07	0.77	1.34	0.10	1.02	1.32	0.07	1.00
2 May	1145	6.8	12.6	8.40	0.06	8.88	0.91	1.06	7.91	0.31	0.94	8.81	0.02	1.05
2 May	2325	6.8	10.6	15.08	1.20	14.26	0.54	0.95	14.53	1.71	0.96	13.88	1.35	0.92
10 May	945	4.3	14.7	4.20	0.28	3.76	0.51	0.90	6.51	2.55	1.55	3.94	0.15	0.94
10 May	2145	5.5	14.5	7.93	0.41	6.51	0.81	0.82	8.59	0.42	1.08	7.87	0.11	0.99
23 May	1155	9.5	14.0	6.68	1.37	5.15	0.09	0.77	2.47	2.34	0.37	6.60	1.25	0.99
23 May	2155	11.0	9.5	5.27	0.17	4.53	1.03	0.86	6.16	0.13	1.17	5.61	1.01	1.06
14 Jun	1015	10.4	14.4	11.49	0.20	9.65	0.36	0.84	11.21	0.32	0.98	11.41	0.20	0.99
14 Jun	2200	9.5	14.3	5.01	3.25	5.85	0.48	1.17	6.17	0.88	1.23	8.57	1.20	1.71
27 Jun	1315	16.4	*	14.54	0.04									
28 Jun	2215	16.4		9.01	0.60									
11 Jul	1005	10.8		5.14	0.29									
14 Jul	2205	18.8		9.30	0.03									
27 Jul	1005	21.8		3.67	0.19									
27 Jul	2205	22.0		3.80	0.16									
10 Aug	1025	20.8		1.74	0.00									
10 Aug	2215	21.4		2.53	0.16									
26 Aug	1100	19.0		7.30	0.08									
26 Aug	2200	19.4		7.03	6.93									
15 Sep	1100	18.2	0.3	6.59	0.21	6.46	0.24	0.9[illegible]	6.85	0.21	1.04	6.0[illegible]	0.40	0.92
15 Sep	2145	18.2	0.2	4.38	0.06	4.95	0.37	1.13	4.56	0.03	1.04	4.90	0.16	1.12
27 Sep	1100	9.1	5.4	2.43	0.11	2.61	0.03	1.07	3.06	0.16	1.26	3.01	0.27	1.24
27 Sep	2215	12.0	6.1	2.58	0.21	2.08	0.08	0.81	1.82	0.29	0.71	2.40	0.03	0.93
10 Oct	1045	13.3	12.0	7.13	1.31	0.00**	0.00	0.00	7.63	0.13	1.07	6.96	0.59	0.98
10 Oct	2145	13.1	10.1	4.15	0.02	3.96	0.04	0.95	4.20	0.11	1.01	4.13	0.13	1.00
24 Oct	1105	11.1	14.7	3.73	0.15	3.59	0.13	0.96	3.94	0.06	1.06	3.75	0.00	1.01
24 Oct	2145	11.7	15.7	3.27	0.02	2.93	0.02	0.90	3.35	0.06	1.02	3.42	0.09	1.05

*Blank spaces indicate James A. Fitzpatrick plant shutdown; entrainment (intake) sample taken but viability (discharge and simulation) samples not required.

**Replicates 1 and 2 missing, broken during shipment.

#Micrograms/liter

Table J-2 (CONTD)

CHLOROPHYLL *a* CONCENTRATIONS# IN WHOLE WATER COLLECTIONS AFTER 7-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
11 Nov	1045	11.3	16.8	3.84	0.03	3.90	0.11	1.02	3.54	0.04	0.92	3.48	0.07	0.91
11 Nov	2100	6.2	16.8	0.99	0.02	0.97	0.21	0.98	1.12	0.02	1.13	1.31	0.05	1.32
20 Nov	1040	8.3	16.4	2.28	0.09	2.11	0.09	0.93	2.24	0.05	0.98	2.22	0.07	0.97
20 Nov	2000	8.1	16.5	2.05	0.03	1.88	0.03	0.92	2.05	0.03	1.00	1.98	0.13	0.97
12 Dec	1031	5.0	14.0	2.07	0.43	1.77	0.13	0.86	1.86	0.38	0.90	1.62	0.23	0.78
12 Dec	2035	4.4	14.8	1.29	0.74	2.45	0.13	1.90	2.34	0.86	1.81	2.55	0.02	1.98
19 Dec	1140	3.0	15.3	1.75	0.74	1.65	0.05	0.94	1.98	0.80	1.13	1.29	0.74	0.74
19 Dec	2100	3.1	15.9	1.73	1.18	0.68	0.13	0.39	1.08	0.74	0.62	2.05	0.41	1.18

#Micrograms/liter

Table J-3

CHLOROPHYLL *a* CONCENTRATIONS[a] IN WHOLE WATER COLLECTIONS AFTER 24-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977 *

				INTAKE			DISCHARGE			3 C SIMULATION			2 C SIMULATION		
DATE	DAY[b] NIGHT[c]	INTAKE[d] TEMP.(C)	ΔT[e]	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN
5 JAN	1020	2.5	17.7	4.9	4.2	4.55	4.7	6.8	5.75	3.5	3.7	3.60	3.3	3.3	3.30
	2115	2.1	18.4	4.2	3.7	3.95	3.7	3.7	3.70	4.4	4.2	4.30	3.7	3.7	3.70
19 JAN	1002	1.1	17.8	2.1	2.1	2.10	2.1	2.1	2.10	1.4	1.9	1.65	2.1	1.9	2.00
	2121	1.0	17.2	2.1	2.1	2.10	1.9	1.6	1.75	2.1	2.3	2.20	2.8	2.1	2.45
7 FEB	1034	3.9	12.2	1.9	1.9	1.90	1.6	2.1	1.85	1.9	2.1	2.00	1.4	1.4	1.40
	2105	1.3	18.3	1.6	1.9	1.75	1.6	1.6	1.60	1.6	1.6	1.60	1.6	1.6	1.60
16 FEB	1015	1.8	19.9	1.6	0.5	1.05	1.2	1.6	1.40	1.6	1.9	1.75	1.4	1.6	1.50
	2045	2.5	19.0	2.0	1.6	1.80	1.6	1.6	1.60	1.6	2.1	1.85	1.9	1.9	1.90
7 MAR	0953	6.3	14.9	2.5	2.1	2.30	2.3	2.3	2.30	2.3	2.3	2.30	2.1	2.1	2.10
	2047	2.3	11.3	5.4	6.5	5.95	6.1	6.1	6.10	6.3	5.3	5.80	5.1	6.3	5.70
21 MAR	0950	1.0	18.2	7.7	7.0	7.35	8.2	7.7	7.95	7.5	7.0	7.25	6.5	6.5	6.50
	1950	1.3	17.5	5.1	4.9	5.00	3.7	3.7	3.70	5.6	4.9	5.25	5.6	4.4	5.00

[a] μg/liter
[b] Time in 2400 hrs.
[c] Time in 2400 hrs.
[d] Intake temperature before tempering.
[e] Discharge minus intake temperature.
*Viability data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-4

CHLOROPHYLL *a* CONCENTRATIONS# IN WHOLE WATER COLLECTIONS AFTER 24-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
19 Apr	1320	3.0	15.0	2.26	0.29	0.52	0.42	0.23	2.53	0.07	1.12	2.35	0.21	1.04
19 Apr	2330	3.1	14.4	2.20	0.60	1.48	0.08	0.67	2.10	0.33	0.95	1.83	0.35	0.83
2 May	1145	6.8	12.6	7.62	0.10	6.86	0.04	0.90	7.19	0.21	0.94	5.49	2.08	0.72
2 May	2325	6.8	10.6	14.38	0.21	15.30	0.51	1.06	14.40	0.31	1.00	13.66	0.52	0.95
10 May	945	4.3	14.7	3.70	0.09	4.75	0.60	1.28	4.17	0.47	1.13	5.03	0.08	1.36
10 May	2145	5.5	14.5	7.07	0.37	8.28	0.35	1.17	7.99	0.10	1.13	7.67	1.05	1.08
23 May	1155	9.5	14.0	5.21	2.30	3.12	0.25	0.60	2.74	0.00	0.53	6.01	4.16	1.15
23 May	2155	11.0	9.5	3.94	0.61	3.73	1.16	0.95	1.67*	0.00	0.42	3.10	0.15	0.79
14 Jun	1015	10.4	14.4	9.77	0.24	9.77	0.40	1.00	9.49	1.64	0.97	8.81	0.40	0.90
14 Jun	2200	9.5	14.3	9.81	0.52	8.01	0.64	0.82	9.05	0.72	0.92	9.89	0.04	1.01
15 Sep	1100	18.2	0.3	7.01	0.11	6.70	0.06	0.96	6.20	0.03	0.88	6.17	0.16	0.88
15 Sep**	2145	18.2	0.2	3.40	0.24	3.82	0.13	1.12	3.46	0.05	1.02	3.96	0.27	1.16
27 Sep	1100	9.1	5.4	2.88	0.03	2.63	0.00	0.91	3.16	0.00	1.10	2.80	0.06	0.97
27 Sep	2215	12.0	6.4	2.56	0.03	2.59	0.11	1.01	2.82	0.24	1.10	2.74	0.05	1.07
10 Oct	1045	13.3	12.0	8.29	0.07	7.57	0.15	0.91	7.93	0.13	0.96	7.78	0.15	0.94
10 Oct	2145	13.1	10.1	3.94	0.02	3.71	0.08	0.94	4.16	0.07	1.06	3.58	0.42	0.91
24 Oct	1105	11.1	14.7	4.20	0.07	3.61	0.15	0.86	4.47	0.09	1.16	4.07	0.07	0.97
24 Oct	2145	11.7	15.7	3.57	0.11	3.29	0.09	0.92	3.54	0.00	0.99	3.59	0.05	1.01
11 Nov	1045	11.3	16.8	4.81	0.00	4.05	0.21	0.84	4.30	0.25	0.89	4.37	0.15	0.91
11 Nov	2100	6.2	16.8	1.14	0.09	1.05	0.00	0.92	1.25	0.07	1.10	1.20	0.02	1.05
20 Nov	1040	8.3	16.4	2.28	0.09	2.03	0.09	0.89	2.41	0.13	1.06	2.09	0.07	0.92
20 Nov	2000	8.1	16.5	2.19	0.04	1.73	0.47	0.79	1.98	0.13	0.90	2.11	0.04	0.96
12 Dec	1031	5.0	14.0	1.82	0.13	1.52	0.47	0.84	1.56	0.34	0.86	2.09	0.36	1.15
12 Dec	2035	4.4	14.8	2.32	0.21	3.14	0.40	1.35	2.32	0.21	1.00	0.83	0.32	0.36
19 Dec	1140	3.0	15.3	2.87	0.13	2.76	0.02	0.96	2.89	0.11	1.01	1.08	0.11	0.38
19 Dec	2100	3.1	15.9	2.17	0.15	2.22	0.11	1.02	2.24	0.09	1.03	1.77	0.59	0.82

*Replicate 2 missing

**Samples representing the 24-hr incubation were incubated for 37.5 hrs.

#Micrograms/liter

Table J-5

CHLOROPHYLL *a* CONCENTRATIONS[a] IN WHOLE WATER COLLECTIONS AFTER 48-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977 *

DATE	DAY[b] NIGHT[c]	INTAKE[d] TEMP.(C)	ΔT[e]	INTAKE R-1	INTAKE R-2	INTAKE MEAN	DISCHARGE R-1	DISCHARGE R-2	DISCHARGE MEAN	3 C SIMULATION R-1	3 C SIMULATION R-2	3 C SIMULATION MEAN	2 C SIMULATION R-1	2 C SIMULATION R-2	2 C SIMULATION MEAN
5 JAN	1020	2.5	17.7	4.2	4.0	4.10	3.5	3.3	3.40	4.0	4.7	4.35	3.7	4.2	3.95
	2115	2.1	18.4	3.5	3.7	3.60	2.3	4.2	3.25	3.3	3.3	3.30	3.5	3.5	3.50
19 JAN	1002	1.1	17.8	1.6	2.1	1.85	1.2	1.6	1.40	2.1	1.9	2.00	1.6	1.9	1.75
	2121	1.0	17.2	2.8	2.6	2.70	2.8	2.3	2.55	2.6	2.3	2.45	2.6	2.6	2.60
7 FEB	1034	3.9	12.2	2.8	2.6	2.70	2.3	2.8	2.55	2.1	2.1	2.10	2.1	2.1	2.10
	2105	1.3	18.3	2.3	2.6	2.45	2.1	2.3	2.20	2.3	2.3	2.30	2.1	1.9	2.00
16 FEB	1015	1.8	19.9	1.4	1.6	1.50	1.4	1.4	1.40	1.6	1.6	1.60	1.4	1.6	1.50
	2045	2.5	19.0	1.6	1.6	1.60	0.9	0.9	0.90	0.9	0.9	0.90	1.2	1.4	1.30
7 MAR	0953	6.3	14.9	3.3	2.8	3.05	1.9	2.1	2.00	2.1	1.9	2.00	2.1	2.8	2.45
	2047	2.3	11.3	7.2	6.5	6.85	7.4	7.2	7.30	6.5	7.7	7.10	5.8	8.2	7.00
21 MAR	0950	1.0	18.2	8.6	9.3	8.95	8.2	10.3	9.25	7.7	8.2	7.95	7.7	8.6	8.15
	1950	1.3	17.5	4.9	5.1	5.00	4.0	4.2	4.10	6.1	5.8	5.95	5.6	4.4	5.00

[a] μg/liter
[b] Time in 2400 hrs.
[c] Time in 2400 hrs.
[d] Intake temperature before tempering.
[e] Discharge minus intake temperature.
*Viability data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-6

CHLOROPHYLL *a* CONCENTRATIONS[#] IN WHOLE WATER COLLECTIONS AFTER 48-HOUR INCUBATION JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
19 Apr	1320	3.0	15.0	1.77	0.28	<0.10	0.00	0.06	1.52	0.32	0.86	1.34	0.03	0.76
19 Apr	2330	3.1	14.4	2.06	0.29	1.85	0.25	0.90	1.56	0.04	0.76	1.40	0.26	0.68
2 May	1145	6.8	12.6	6.51	1.01	4.87	0.02	0.75	6.29	0.33	0.97	6.06	0.35	0.93
2 May	2325	6.8	10.6	18.84	1.09	18.02	0.27	0.96	16.37	0.39	0.87	16.15	2.47	0.86
10 May	945	4.3	14.7	4.79	0.11	4.89	0.00	1.02	5.18	0.58	1.08	5.80	0.02	1.21
10 May	2145	5.5	14.5	7.36	1.77	7.25	0.27	0.99	7.48	0.54	1.02	6.53	2.15	0.89
23 May	1155	9.5	14.0	4.47	0.42	4.13	0.25	0.92	3.82	1.21	0.85	3.69	1.08	0.83
23 May	2155	11.0	9.5	5.27	0.25	5.48	1.39	1.04	4.32	0.32	0.82	4.60	0.05	0.87
14 Jun	1015	10.4	14.4	9.45	0.64	8.33	0.24	0.88	8.29	0.20	0.88	7.41	0.44	0.78
14 Jun	2200	9.5	14.3	9.13	0.64	5.89	3.89	0.65	7.93	2.56	0.87	8.29	2.48	0.91
15 Sep	1100	18.2	0.3	6.30	0.03	4.93	0.71	0.78	5.78	0.40	0.92	6.04	0.03	0.96
15 Sep	2145	18.2	0.2	4.17	0.27	3.95	0.58	0.95	3.98	0.13	0.95	4.85	0.69	1.16
27 Sep	1100	9.1	5.4	3.22	0.22	2.82	0.29	0.88	3.08	0.08	0.96	3.24	0.13	1.01
27 Sep	2215	12.0	6.1	3.53	0.26	3.01	0.11	0.85	3.40	0.13	0.96	3.48	0.05	0.99
10 Oct	1045	13.3	12.0	8.92	0.24	8.37	1.67	0.94	7.06	0.53	0.79	9.30	1.42	1.04
10 Oct	2145	13.1	10.1	4.18	0.43	4.26	0.00	1.02	2.24	2.20	0.54	4.34	0.04	1.04
24 Oct	1105	11.1	14.7	4.73	0.09	3.61	0.87	0.76	5.38	0.11	1.14	5.10	0.25	1.08
24 Oct	2145	11.7	15.7	3.54	0.00	3.29	0.09	0.93	3.36	0.11	0.95	3.76	0.09	1.06
11 Nov	1045	11.3	16.8	5.44	0.21	4.43	0.13	0.81	3.60	0.12	0.66	3.75	0.38	0.69
11 Nov	2100	6.2	16.8	1.08	0.03	1.42	0.11	1.31	1.41	0.02	1.31	1.33	0.07	1.23
20 Nov	1040	8.3	16.4	2.57	0.04	2.51	0.23	0.98	2.68	0.19	1.04	2.43	0.15	0.95
20 Nov	2000	8.1	16.5	2.53	0.13	1.82	0.09	0.72	2.43	0.03	0.96	2.40	0.17	0.95
12 Dec	1031	5.0	14.0	3.19	0.32	2.00	0.02	0.63	1.46	1.08	0.46	0.80	0.25	0.25
12 Dec	2035	4.4	14.8	3.42	0.17	1.71	1.08	0.50	2.96	0.09	0.87	3.40	0.45	0.99
19 Dec	1140	3.0	15.3	3.46	0.00	3.21	0.26	0.93	3.04	0.09	0.88	3.02	0.49	0.87
19 Dec	2100	3.1	15.9	2.07	1.94	1.86	1.44	0.90	1.79	1.54	0.86	0.61	0.15	0.29

[#] Micrograms/liter

Table J-7

CHLOROPHYLL *a* CONCENTRATIONS[a] IN WHOLE WATER COLLECTIONS AFTER 72-HOUR INCUBATION
JAMES A FITZPATRICK NUCLEAR POWER PLANT, 1977*

DATE	DAY[b] NIGHT[c]	INTAKE[d] TEMP.(C)	ΔT[e]	INTAKE R-1	INTAKE R-2	INTAKE MEAN	DISCHARGE R-1	DISCHARGE R-2	DISCHARGE MEAN	3 C SIMULATION R-1	3 C SIMULATION R-2	3 C SIMULATION MEAN	2 C SIMULATION R-1	2 C SIMULATION R-2	2 C SIMULATION MEAN
5 JAN	1020	2.5	17.7	3.5	3.0	3.25	2.8	2.8	2.80	4.7	4.9	4.80	3.5	4.2	3.85
	2115	2.1	18.4	1.9	1.2	1.55	3.5	2.6	3.05	1.2	1.4	1.30	1.2	1.9	1.55
19 JAN	1002	1.1	17.8	2.8	2.6	2.70	2.1	2.1	2.10	2.6	2.1	2.35	2.6	2.3	2.45
	2121	1.0	17.2	3.7	3.7	3.70	2.6	1.9	2.25	2.1	3.0	2.55	2.8	3.0	2.90
7 FEB	1034	3.9	12.2	2.1	1.6	1.85	2.1	2.1	2.10	1.4	2.1	1.75	1.9	2.1	2.00
	2105	1.3	18.3	2.3	2.6	2.45	3.0	2.3	2.65	1.9	2.3	2.10	2.6	2.1	2.35
16 FEB	1015	1.8	19.9	0.9	0.9	0.90	1.2	0.7	0.95	0.9	0.9	0.90	1.2	1.6	1.40
	2045	2.5	19.0	1.4	1.4	1.40	1.2	1.4	1.30	0.9	1.2	1.05	1.2	1.4	1.30
7 MAR	0953	6.3	14.9	2.8	3.3	3.05	2.1	2.3	2.20	2.1	3.0	2.55	2.6	3.0	2.80
	2047	2.3	11.3	9.3	6.8	8.05	7.5	7.9	7.70	7.5	8.4	7.95	8.6	10.0	9.30
21 MAR	0950	1.0	18.2	11.9	11.2	11.55	9.1	8.9	9.00	8.9	7.7	8.30	9.1	8.4	8.75
	1950	1.3	17.5	6.5	6.5	6.50	4.2	7.2	5.70	7.7	7.7	7.70	7.5	5.1	6.30

[a] μg/liter
[b] Time in 2400 hrs.
[c] Time in 2400 hrs.
[d] Intake temperature before tempering.
[e] Discharge minus intake temperature.
*Viability data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-8

CHLOROPHYLL *a* CONCENTRATIONS# IN WHOLE WATER COLLECTIONS AFTER 72-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
19 Apr	1320	3.0	15.0	1.92	0.65	1.12	1.02	0.58	1.15	0.09	0.60	1.32	0.42	0.69
19 Apr	2330	3.1	14.4	1.71	0.81	1.91	0.39	1.12	1.40	0.17	0.82	0.54*	0.00	0.32
2 May	1145	6.8	12.6	5.45	0.41	6.98	0.04	1.28	3.64*	0.00	0.67	9.02	0.02	1.65
2 May	2325	6.8	10.6	18.41	1.28	18.32	1.07	1.00	18.75	0.43	1.02	13.01	4.01	0.71
10 May	945	4.3	14.7	3.97	0.09	2.91	0.38	0.73	2.28	0.51	0.57	3.21	0.55	0.81
10 May	2145	5.5	14.5	5.33	1.75	5.82	0.38	1.09	4.86	0.31	0.91	4.66	0.32	0.87
23 May	1155	9.5	14.0	3.45	3.35	5.02	1.06	1.46	5.02	0.93	1.46	5.54	0.99	1.61
23 May	2155	11.0	9.5	9.17	2.26	1.27	0.43	0.14	3.29	0.97	0.36	1.78	1.68	0.19
14 Jun	1015	10.4	14.4	6.97	0.32	7.01	0.12	1.01	7.13	0.00	1.02	7.65	0.44	1.10
14 Jun	2200	9.5	14.3	8.33	1.36	8.93	1.40	1.07	9.73	0.20	1.17	9.41	0.92	1.13
15 Sep	1100	18.2	0.3	4.35	0.35	5.82	0.71	1.34	6.19	0.87	1.42	4.51	0.03	1.04
15 Sep	2145	18.2	0.2	4.96	0.06	4.03	0.03	0.81	4.48	0.26	0.90	4.80	0.32	0.97
27 Sep	1100	9.1	5.4	2.85	0.22	2.40	0.08	0.84	3.14	0.35	1.10	2.16	0.42	0.76
27 Sep	2215	12.0	6.1	3.35	0.19	3.56	0.03	1.06	3.59	0.11	1.07	3.61	0.03	1.08
10 Oct	1045	13.3	12.0	8.90	0.34	8.41	0.65	0.94	9.26	1.04	1.04	8.35	0.13	0.94
10 Oct	2145	13.1	10.1	4.30	0.21	5.65	1.48	1.31	4.54	0.11	1.06	3.96	0.17	0.92
24 Oct	1105	11.1	14.7	4.58	0.28	3.75	0.04	0.82	4.58	0.03	1.00	4.30	0.21	0.94
24 Oct	2145	11.7	15.7	4.34	0.04	3.80	0.05	0.88	3.63	0.09	0.84	4.34	0.21	1.00
11 Nov	1045	11.3	16.8	5.25	0.19	4.87	0.15	0.93	4.98	0.26	0.95	4.39	0.17	0.84
11 Nov	2100	6.2	16.8	1.20	0.02	1.14	0.04	0.95	1.31	0.13	1.09	1.29	0.19	1.08
20 Nov	1040	8.3	16.4	2.62	0.05	1.85	0.00	0.71	2.11	0.47	0.81	2.45	0.05	0.94
20 Nov	2000	8.1	16.5	2.64	0.07	2.26	0.11	0.86	2.64	0.24	1.00	2.34	0.32	0.89
12 Dec	1031	5.0	14.0	3.61	0.24	1.92	1.33	0.53	2.76	0.65	0.76	3.33	0.17	0.92
12 Dec	2035	4.4	14.8	3.94	0.57	2.38	1.75	0.60	2.62	0.09	0.66	1.06	0.13	0.27
19 Dec	1140	3.0	15.3	1.84	1.04	1.71	1.33	0.93	1.88	1.71	1.02	2.62	0.55	1.42
19 Dec	2100	3.1	15.9	2.45	0.13	2.03	0.09	0.83	2.34	0.02	0.96	2.09	0.32	0.85

*Replicate 1 missing
#Micrograms/liter

Table J-9

PHAEOPHYTIN *a* CONCENTRATIONS# IN WHOLE WATER COLLECTIONS AFTER 7-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
19 Apr	1320	3.0	15.0	0.17	0.07	3.99	0.33	23.47	0.51	0.04	3.00	0.48	0.29	2.82
19 Apr	2330	3.1	14.4	1.00	0.04	0.35	0.25	0.35	0.93	0.12	0.93	0.89	0.00	0.89
2 May	1145	6.8	12.6	0.60	0.03	0.50	0.40	0.83	1.18	0.31	1.97	0.85	0.25	1.42
2 May	2325	6.8	10.6	0.96	0.66	1.20	0.55	1.25	2.78	2.41	2.90	3.36	1.39	3.50
10 May	945	4.3	14.7	1.14	0.19	0.91	0.11	0.80	2.01	1.65	1.76	1.15	0.19	1.01
10 May	2145	5.5	14.5	1.42	0.17	1.08	0.46	0.76	1.54	0.41	1.08	1.29	0.43	0.91
23 May	1155	9.5	14.0	0.50	0.40	0.88	0.21	1.76	5.71	5.38	11.42	0.13	0.03	0.26
23 May	2155	11.0	9.5	0.96	0.07	0.86	0.20	0.90	1.15	0.27	1.20	1.39	0.17	1.45
14 Jun	1015	10.4	14.4	3.48	0.32	3.44	0.05	0.99	4.21	0.16	1.21	3.59	0.34	1.03
14 Jun	2200	9.5	14.3	1.00	0.90	2.04	0.45	2.04	1.77	0.05	1.77	2.39	0.40	2.39
27 Jun	1315	16.4	*	2.76	0.01									
28 Jun	2215	16.4		1.20	0.94									
11 Jul	1005	10.8		<0.10	0.00									
14 Jul	2205	18.8		<0.10	0.00									
27 Jul	1005	21.8		0.14	0.04									
27 Jul	2205	22.0		<0.10	0.00									
10 Aug	1025	20.8		0.24	0.13									
10 Aug	2215	21.4		<0.10	0.00									
26 Aug	1100	19.0		<0.10	0.00									
26 Aug	2200	19.4		5.46	5.36									
15 Aug	1100	18.2	0.3	2.16	0.47	2.20	0.04	1.02	1.53	0.14	0.71	2.60	0.77	1.20
15 Sep	2145	18.2	0.2	1.29	0.04	0.91	0.22	0.71	1.12	0.10	0.87	1.10	0.16	0.85
27 Sep	1100	9.1	5.4	2.35	0.53	2.19	0.09	0.93	2.44	0.27	1.04	2.09	0.27	0.89
27 Sep	2215	12.0	6.1	0.46	0.41	0.67	0.17	1.46	0.99	0.16	2.15	0.82	0.20	1.78
10 Oct	1045	13.3	12.0	4.59	0.58	0.00**	0.00	0.00	5.31	0.15	1.16	4.78	0.43	1.04
10 Oct	2145	13.1	10.1	2.45	0.04	2.14	0.12	0.87	2.46	0.12	1.00	2.29	0.06	0.93
24 Oct	1105	11.1	14.7	0.81	0.00	0.74	0.08	0.91	0.88	0.04	1.09	0.96	0.02	1.19
24 Oct	2145	11.7	15.7	0.84	0.04	0.76	0.05	0.90	0.74	0.05	0.88	0.75	0.03	0.89

*Blank spaces indicate James A. Fitzpatrick plant shutdown; entrainment (intake) samples taken but viability (discharge and simulation) sampled not required.

**Replicates 1 and 2 missing, broken during shipment.

#Microgram/liter

Table J-9 (CONTD)

PHAEOPHYTIN *a* CONCENTRATIONS# IN WHOLE WATER COLLECTIONS AFTER 7-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3°S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
11 Nov	1045	11.3	16.8	0.87	0.03	1.17	0.18	1.34	0.80	0.05	0.92	0.83	0.08	0.95
11 Nov	2100	6.2	16.8	0.66	0.07	0.27	0.03	0.41	0.54	0.03	0.82	0.45	0.06	0.68
20 Nov	1040	8.3	16.4	0.77	0.01	0.64	0.24	0.83	0.75	0.05	0.97	0.89	0.07	1.16
20 Nov	2000	8.1	16.5	0.54	0.10	0.50	0.05	0.93	0.60	0.10	1.11	0.53	0.13	0.98
12 Dec	1031	5.0	14.0	0.90	0.18	0.45	0.26	0.50	0.55	0.11	0.61	0.68	0.53	0.76
12 Dec	2035	4.4	14.8	2.35	0.80	1.25	0.38	0.53	2.25	1.09	0.96	1.39	0.05	0.59
19 Dec	1140	3.0	15.3	1.30	0.90	1.52	0.02	1.17	0.89	0.79	0.68	1.79	0.95	1.38
19 Dec	2100	3.1	15.9	1.46	1.36	2.37	0.06	1.62	2.00	0.68	1.37	1.04	0.30	0.71

#Micrograms/liter

Table J-10

PHAEOPHYTIN *a* CONCENTRATIONS# IN WHOLE WATER COLLECTIONS AFTER 24-HOUR INCUBATION JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
19 Apr	1320	3.0	15.0	<0.10	0.00	3.83	0.98	38.30	<0.10	0.00	1.00	<0.10	0.00	1.00
19 Apr	2330	3.1	14.4	0.43	0.33	0.42	0.01	0.98	<0.10	0.00	0.23	0.31	0.21	0.72
2 May	1145	6.8	12.6	0.29	0.19	0.34	0.10	1.17	0.52	0.42	1.79	2.18	1.83	7.52
2 May	2325	6.8	10.6	2.92	0.87	1.13	0.51	0.39	1.53	0.31	0.52	1.31	0.73	0.45
10 May	945	4.3	14.7	0.43	0.02	0.93	0.28	2.16	0.67	0.07	1.56	1.20	0.20	2.79
10 May	2145	5.5	14.5	1.29	0.25	3.23	0.24	2.50	2.93	0.35	2.27	1.58	0.32	1.22
23 May	1155	9.5	14.0	0.75	0.65	1.28	0.25	1.71	0.74	0.06	0.99	0.42	0.32	0.56
23 May	2155	11.0	9.5	1.15	0.04	1.39	0.08	1.21	0.45*	0.00	0.39	1.43	0.28	1.24
14 Jun	1015	10.4	14.4	2.17	0.63	2.40	0.50	1.11	1.14	0.27	0.53	2.10	0.04	0.97
14 Jun	2200	9.5	14.3	1.21	0.02	1.58	0.03	1.31	1.10	0.07	0.91	2.14	0.05	1.77
15 Sep	1100	18.2	0.3	1.35	0.20	1.87	0.17	1.39	1.63	0.23	1.21	1.97	0.07	1.46
15 Sep**	2145	18.2	0.2	1.64	0.85	1.25	0.48	0.76	1.01	0.19	0.62	0.88	0.01	0.54
27 Sep	1100	9.1	5.4	1.76	0.16	2.27	0.26	1.29	1.62	0.02	0.92	1.82	0.02	1.03
27 Sep	2215	12.0	6.1	0.82	0.03	0.79	0.17	0.96	0.67	0.37	0.82	0.77	0.03	0.94
10 Oct	1045	13.3	12.0	4.91	0.29	4.49	0.14	0.91	4.53	0.19	0.92	5.24	0.59	1.07
10 Oct	2145	13.1	10.1	2.07	0.12	1.94	0.10	0.94	2.14	0.18	1.03	1.98	0.18	0.96
24 Oct	1105	11.1	14.7	0.75	0.02	0.63	0.07	0.84	0.51	0.25	0.68	0.82	0.07	1.09
24 Oct	2145	11.7	15.7	0.60	0.10	0.59	0.09	0.98	0.68	0.06	1.13	0.77	0.00	1.28
11 Nov	1045	11.3	16.8	0.86	0.09	0.66	0.02	0.77	0.82	0.03	0.95	0.76	0.14	0.88
11 Nov	2100	6.2	16.8	0.43	0.01	0.50	0.02	1.16	0.39	0.04	0.91	0.42	0.11	0.98
20 Nov	1040	8.3	16.4	0.38	0.11	0.53	0.05	1.39	0.18	0.11	0.47	0.54	0.08	1.42
20 Nov	2000	8.1	16.5	0.67	0.01	0.62	0.33	0.93	0.68	0.16	1.01	0.64	0.05	0.96
12 Dec	1031	5.0	14.0	0.92	0.01	1.04	0.25	1.13	0.61	0.12	0.66	0.62	0.16	0.67
12 Dec	2035	4.4	14.8	0.99	0.03	0.89	0.06	0.90	1.42	0.19	1.43	2.93	0.50	2.96
19 Dec	1140	3.0	15.3	0.60	0.23	0.77	0.04	1.28	0.45	0.05	0.75	1.07	0.95	1.78
19 Dec	2100	3.1	15.9	0.47	0.25	0.53	0.05	1.13	0.37	0.01	0.79	1.17	0.79	2.49

*Replicate 2 missing

**Samples representing the 24-hr incubation were incubated for 37.5 hrs.

#Micrograms/liter

Table J-11

PHAEOPHYTIN *a* CONCENTRATIONS# IN WHOLE WATER COLLECTIONS AFTER 48-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
19 Apr	1320	3.0	15.0	0.21	0.11	4.88	0.22	23.24	0.16	0.06	0.76	0.48	0.02	2.29
19 Apr	2330	3.1	14.4	0.22	0.12	<0.10	0.00	0.48	0.54	0.02	2.57	0.50	0.33	2.38
2 May	1145	6.8	12.6	0.48	0.38	1.07	0.09	2.23	1.16	1.06	2.42	0.26	0.16	0.54
2 May	2325	6.8	10.6	1.18	0.70	1.22	0.44	1.03	2.64	1.69	2.24	3.78	1.66	3.20
10 May	945	4.3	14.7	1.12	0.05	1.26	0.37	1.13	1.27	0.20	1.13	1.85	0.02	1.65
10 May	2145	5.5	14.5	2.30	0.12	2.08	0.01	0.90	2.40	0.09	1.04	1.22	0.91	0.53
23 May	1155	9.5	14.0	0.88	0.28	0.96	0.30	1.09	0.53	0.22	0.60	0.52	0.21	0.59
23 May	2155	11.0	9.5	0.32	0.22	1.59	0.81	4.97	1.01	0.16	3.16	1.12	0.24	3.50
14 Jun	1015	10.4	14.4	1.46	0.39	2.38	0.63	1.63	1.30	0.31	0.89	1.96	0.05	1.34
14 Jun	2200	9.5	14.3	1.89	0.12	1.08	0.98	0.57	0.90	0.55	0.48	0.69	0.59	0.37
15 Sep	1100	18.2	0.3	1.19	0.05	0.94	0.14	0.79	1.09	0.32	0.92	1.27	0.38	1.07
15 Sep	2145	18.2	0.2	1.68	0.91	1.10	0.06	0.65	1.43	0.23	0.85	1.13	0.06	0.67
27 Sep	1100	9.1	5.4	1.21	0.43	1.79	0.40	1.48	2.32	0.05	1.92	1.37	0.54	1.13
27 Sep	2215	12.0	6.1	1.06	0.32	0.91	0.05	0.86	1.03	0.17	0.97	0.89	0.44	0.84
10 Oct	1045	13.3	12.0	4.35	0.51	4.22	0.24	0.97	3.98	0.01	0.91	4.28	0.36	0.98
10 Oct	2145	13.1	10.1	2.44	0.28	1.78	0.08	0.73	5.62	3.61	2.30	2.05	0.18	0.84
24 Oct	1105	11.1	14.7	0.61	0.05	0.66	0.24	1.08	0.57	0.09	0.93	0.70	0.03	1.15
24 Oct	2145	11.7	15.7	0.61	0.17	0.91	0.15	1.49	0.63	0.04	1.03	0.72	0.07	1.18
11 Nov	1045	11.3	16.8	0.60	0.08	0.65	0.11	1.08	0.69	0.03	1.15	0.59	0.01	0.98
11 Nov	2100	6.2	16.8	0.48	0.04	0.36	0.08	0.75	0.45	0.08	0.94	0.39	0.04	0.81
20 Nov	1040	8.3	16.4	0.53	0.10	0.52	0.01	0.98	0.33	0.23	0.62	0.60	0.10	1.13
20 Nov	2000	8.1	16.5	0.54	0.02	0.51	0.14	0.94	0.50	0.02	0.93	0.55	0.14	1.02
12 Dec	1031	5.0	14.0	0.32	0.22	1.22	0.44	3.81	1.40	0.68	4.38	2.65	0.16	8.28
12 Dec	2035	4.4	14.8	1.10	0.13	2.24	1.36	2.04	0.86	0.21	0.78	0.57	0.47	0.52
19 Dec	1140	3.0	15.3	0.37	0.11	0.49	0.11	1.32	0.73	0.16	1.97	0.94	0.72	2.54
19 Dec	2100	3.1	15.9	1.95	1.68	1.64	1.54	0.84	1.68	1.56	0.86	2.69	0.06	1.38

#Micrograms/liter

Table J-12

PHAEOPHYTIN *a* CONCENTRATIONS[#] IN WHOLE WATER COLLECTIONS AFTER 72-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
19 Apr	1320	3.0	15.0	0.18	0.08	2.12	2.02	11.78	0.84	0.21	4.67	0.18	0.08	1.00
19 Apr	2330	3.1	14.4	1.26	0.32	0.17	0.07	0.13	0.79	0.41	0.63	0.22*	0.00	0.17
2 May	1145	6.8	12.6	0.86	0.76	1.09	0.57	1.27	0.50*	0.00	0.58	2.30	0.20	2.67
2 May	2325	6.8	10.6	5.31	1.15	2.05	1.62	0.39	3.92	0.07	0.74	2.95	2.85	0.56
10 May	945	4.3	14.7	0.36	0.26	0.71	0.07	1.97	0.37	0.26	1.03	0.62	0.44	1.72
10 May	2145	5.5	14.5	1.13	0.08	1.10	0.10	0.97	1.10	0.17	0.97	0.66	0.38	0.58
23 May	1155	9.5	14.0	5.85	4.49	1.01	0.31	0.17	0.95	0.23	0.16	1.47	0.36	0.25
23 May	2155	11.0	9.5	<0.10	0.00	3.62	0.07	36.20	0.92	0.44	9.20	6.76	5.65	67.60
14 Jun	1015	10.4	14.4	2.15	0.05	1.49	0.26	0.69	1.73	0.00	0.80	0.54	0.12	0.25
14 Jun	2200	9.5	14.3	3.95	2.37	0.89	0.06	0.23	1.54	0.03	0.39	1.13	0.26	0.29
15 Sep	1100	18.2	0.3	1.04	0.14	1.83	0.69	1.76	1.39	0.07	1.34	1.19	0.14	1.14
15 Sep	2145	18.2	0.2	0.90	0.08	0.84	0.01	0.93	0.94	0.29	1.04	1.11	0.02	1.23
27 Sep	1100	9.1	5.4	1.66	0.25	1.72	0.31	1.04	2.12	0.25	1.28	1.20	0.32	0.72
27 Sep	2215	12.0	6.1	0.79	0.12	1.15	0.01	1.46	0.84	0.03	1.06	1.00	0.03	1.27
10 Oct	1045	13.3	12.0	5.83	0.16	5.30	0.23	0.91	5.34	0.46	0.92	5.58	0.05	0.96
10 Oct	2145	13.1	10.1	1.72	0.20	2.39	0.63	1.39	1.56	0.03	0.91	1.62	0.17	0.94
24 Oct	1105	11.1	14.7	0.64	0.07	0.30	0.08	0.47	0.68	0.07	1.06	0.59	0.25	0.92
24 Oct	2145	11.7	15.7	0.75	0.12	0.75	0.05	1.00	0.58	0.01	0.77	0.74	0.07	0.99
11 Nov	1045	11.3	16.8	0.88	0.18	0.86	0.15	0.98	0.55	0.05	0.63	0.71	0.07	0.81
11 Nov	2100	6.2	16.8	0.36	0.02	0.36	0.06	1.00	0.50	0.13	1.39	0.42	0.12	1.17
20 Nov	1040	8.3	16.4	0.74	0.09	0.61	0.05	0.82	0.67	0.35	0.91	0.60	0.02	0.81
20 Nov	2000	8.1	16.5	0.63	0.07	0.47	0.12	0.75	0.63	0.10	1.00	0.63	0.04	1.00
12 Dec	1031	5.0	14.0	0.23	0.13	1.62	1.52	7.04	1.14	0.54	4.96	0.15	0.05	0.65
12 Dec	2035	4.4	14.8	0.84	0.08	1.85	0.91	2.20	0.97	0.46	1.15	3.77	0.36	4.49
19 Dec	1140	3.0	15.3	2.27	0.92	2.01	1.12	0.89	1.83	1.73	0.81	1.03	0.24	0.45
19 Dec	2100	3.1	15.9	0.21	0.11	0.38	0.05	1.81	0.32	0.07	1.52	0.81	0.37	3.86

*Replicate 1 missing

[#]Micrograms/liter

Table J-13

PRIMARY PRODUCTION (C^{14}) AFTER 7-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977*

DATE	DAY[a] NIGHT[b]	INTAKE[c] TEMP. (°C)	ΔT[d]	INTAKE			DISCHARGE			3°C SIMULATION			2°C SIMULATION		
				R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN
5 JAN	1110	3.2	17.1	3.79	2.64	3.22	4.87	3.23	4.05	4.22	4.12	4.17	2.93	3.55	3.24
	2220	3.6	16.7	2.50	2.07	2.28	3.79	4.93	4.36	3.17	2.24	2.70	3.17	2.66	2.92
19 JAN	1050	0.5	18.5	3.02	3.16	3.09	3.21	2.52	2.86	0.42	2.85	1.64	2.62	2.88	2.75
	2230	0.6	17.9	2.33	3.83	3.08	3.66	4.59	4.12	3.37	4.62	4.00	5.42	3.73	4.58
7 FEB	1130	3.9	12.2	1.40	2.45	1.92	1.53	2.55	2.04	2.41	2.84	2.62	2.58	3.09	2.84
	2205	1.3	18.3	2.43	1.82	2.12	1.86	2.92	2.39	2.51	1.49	2.00	2.82	2.76	2.79
16 FEB	1106	1.8	19.9	2.31	1.25	1.78	2.45	1.43	1.94	1.20	1.72	1.46	2.19	1.68	1.94
	2135	2.5	19.0	3.16	1.78	2.47	1.47	2.34	1.90	1.66	1.82	1.74	1.76	1.38	1.57
7 MAR	1035	6.3	14.9	0.82	1.44	1.13	2.22	3.17	2.70	2.24	2.58	2.41	1.59	2.53	2.06
	2047	2.3	11.3	8.54	7.81	8.18	4.98	12.76	8.87	7.25	11.43	9.34	11.83	8.56	10.20
21 MAR	1031	1.0	18.2	6.40	8.18	7.29	13.56	13.04	13.30	8.22	7.56	6.99	7.76	8.54	8.15
	2034	1.3	17.5	4.67	8.06	6.36	7.09	6.29	6.69	9.39	8.01	8.70	5.24	6.31	5.78

[a/b]Time in 2400 hrs.
[c]Intake temperature before tempering.
[d]Discharge minus intake temperature.

Note: R-1 and R-2 represent the average of light bottles minus the dark bottles.

*Viability data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-14

PRIMARY PRODUCTION# (C^{14}) IN WHOLE WATER COLLECTIONS AFTER 7-HOUR INCUBATION JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

		Intake Temp		Intake		Discharge		D/I	3° Simulation		3° S/I	2° Simulation		2° S/I
Date	Time	(°C)	ΔT	Mean	S.E.	Mean	S.E.	Ratio	Mean	S.E.	Ratio	Mean	S.E.	Ratio
26 Apr	1500	3.0	15.0	13.41	4.72	4.25	0.39	0.32	16.33	0.55	1.22	23.43	0.09	1.75
26 Apr	2215	3.1	14.4	12.60	4.35	19.03	0.05	1.51	41.40	0.66	3.29	10.61*	0.00	0.84
2 May	1145	6.8	12.6	31.06	3.17	18.72	0.95	0.60	30.23	7.08	0.97	19.70	5.45	0.63
2 May	2325	6.8	10.6	17.55	1.85	18.48	6.88	1.05	14.02	10.64	0.80	18.64	6.30	1.06
10 May	945	4.3	14.7	16.36	2.01	11.68	0.58	0.71	15.80	2.57	0.97	13.39	1.10	0.82
10 May	2145	5.5	14.5	27.67	15.14	60.52	1.09	2.19	57.83	8.63	2.09	49.29	2.02	1.78
23 May	1155	9.5	14.0	11.11	2.67	6.48	2.77	0.58	8.94	1.10	0.80	9.69	5.04	0.87
23 May	2155	11.0	9.5	38.40	3.09	14.71	8.27	0.38	6.95	2.51	0.18	24.99	2.75	0.65
14 Jun	1015	10.4	14.4	5.23	3.37	8.43	2.50	1.61	7.40	0.52	1.41	5.93	1.21	1.13
14 Jun	2200	9.5	14.3	24.18	4.82	12.28	5.37	0.51	28.91	1.44	1.20	24.05	0.46	0.99
27 Jun	1315	16.4		18.83**	11.82									
28 Jun	2215	16.4		10.50**	0.00									
11 Jul	1005	10.8		97.86	1.14									
14 Jul	2205	18.8		3.18	1.64									
27 Jul	1115	21.8		46.99	11.24									
27 Jul	2205	22.0		44.97	18.27									
10 Aug	1025	20.8		18.21	1.23									
10 Aug	2215	21.4		14.83	5.12									
26 Aug	1100	19.0		94.95	3.49									
26 Aug	2200	19.4		85.87	0.31									
15 Sep	1100	18.2	0.3	15.35	4.15	3.43	1.09	0.22	20.37	0.69	1.33	13.05	2.27	0.85
15 Sep	2145	18.2	0.2	8.80	0.84	16.94	2.84	1.93	15.92	12.47	1.81	4.51	2.17	0.51
27 Sep	1100	9.1	4.4	48.92	20.15	31.19	4.61	0.64	9.13	7.40	0.19	25.51	25.46	0.52
27 Sep	2215	12.0	6.1	22.00	3.19	21.75	1.00	0.99	23.11	2.30	1.05	17.42	2.27	0.79
10 Oct	1045	13.3	12.0	23.78	0.72	46.68	11.00	1.96	44.89	8.56	1.89	41.16	0.56	1.73
10 Oct	2145	13.1	10.1	17.24	3.71	27.91	6.50	1.62	20.29	10.90	1.18	20.96	4.13	1.22
24 Oct	1105	11.1	14.7	17.57	9.67	11.85	1.08	0.67	17.88	5.34	1.02	6.55	2.38	0.37
24 Oct	2145	11.7	15.7	24.83	6.70	13.72	8.82	0.55	9.34	0.36	0.38	15.73	2.53	0.63

*Replicate 2 missing.

**James A. Fitzpatrick plant shutdown; entrainment (intake) samples taken but viability (discharge and simulation) samples not required.

#mg of C/m^3/incubation period

Table J-14 (CONTD)

PRIMARY PRODUCTION# (C^{14}) IN WHOLE WATER COLLECTIONS AFTER 7-HOUR INCUBATION JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
11 Nov	1045	11.3	16.8	26.73	2.94	21.22	0.28	0.79	17.52	4.02	0.66	13.78	2.21	0.52
11 Nov	2100	6.2	16.8	4.69	0.48	7.50	1.34	1.60	7.58	3.13	1.62	6.63	0.05	1.41
20 Nov	1040	8.3	16.4	19.34	1.79	9.34	0.29	0.48	10.13	0.08	0.52	13.63	0.20	0.70
20 Nov	2000	8.1	16.5	8.55	1.42	5.39	1.02	0.63	10.66	3.93	1.25	10.84	1.36	1.27
12 Dec	1031	5.0	14.0	8.39	0.22	10.89	2.09	1.30	17.89	2.17	2.13	12.37	3.44	1.47
12 Dec	2035	4.4	14.8	8.13	0.90	12.24	1.81	1.51	14.21	6.42	1.75	21.29	2.98	2.62
19 Dec	1140	3.0	15.3	12.07	8.82	13.82	0.41	1.14	8.60	2.56	0.71	13.68	4.90	1.13
19 Dec	2100	3.1	15.9	9.83	1.93	16.68	0.64	1.70	13.12	0.43	1.33	19.87	0.82	2.02

mg of C/m^3/incubation period

Table J-15

PRIMARY PRODUCTION (C^{14}) AFTER 24-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977 **

DATE	DAY[a] NIGHT[b]	INTAKE TEMP.(°C)[c]	ΔT[d]	INTAKE R-1	INTAKE R-2	INTAKE MEAN	DISCHARGE R-1	DISCHARGE R-2	DISCHARGE MEAN	3°C SIMULATION R-1	3°C SIMULATION R-2	3°C SIMULATION MEAN	2°C SIMULATION R-1	2°C SIMULATION R-2	2°C SIMULATION MEAN
5 JAN	1110	3.2	17.1	1.37	1.30	1.34	1.38	1.47	1.42	0.90	1.24	1.07	1.07	1.56	1.32
	2220	3.6	16.7	1.08	3.06	2.07	1.32	1.26	1.29	0.68	1.28	0.98	1.15	0.75	0.95
19 JAN	1050	0.5	18.5	1.98	2.19	2.08	1.83	1.84	1.84	1.66	2.19	1.92	1.89	2.35	2.12
	2230	0.6	17.9	2.56	2.93	2.74	1.96	2.15	2.06	2.70	2.30	2.50	2.30	2.54	2.42
7 FEB	1130	3.9	12.2	1.23	1.30	1.26	1.30	0.85	1.08	0.96	1.22	1.09	1.06	1.01	1.04
	2205	1.3	18.3	1.06	0.88	0.97	0.78	0.53	0.66	0.83	0.99	0.91	0.95	0.92	0.94
16 FEB	1106	1.8	19.9	0.92	0.73	0.82	0.98	0.59	0.79	0.70	0.88	0.79	0.67	0.70	0.68
	2135	2.5	19.0	1.23	0.46	0.84	0.56	0.95	0.76	0.95	0.61	0.78	0.95	0.94	0.94
7 MAR	1035	6.3	14.9	1.43	1.12	1.28	1.45	0.85	1.15	2.25	1.46	1.86	1.50	1.58	1.54
	2047	2.3	11.3	7.79	8.04	7.91	6.39	6.97	6.68	5.55	4.07	4.81	5.74	2.18	13.96
21 MAR	1031	1.0	18.2	8.05	8.94	8.50	10.28	11.01	10.64	7.52	5.68	6.60	7.60	15.85	11.72
	2034*	1.3	17.5	5.13	6.54	5.84	4.54	4.46	4.50	2.22	5.34	3.78	5.69	4.62	5.16

[a/b] Time in 2400 hrs.
[c] Intake temperature before tempering.
[d] Discharge minus intake temperature.

Note: R-1 and R-2 represent the average of light bottles minus the dark bottles.
*Sampled for 34 hours

**Viability data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-16

PRIMARY PRODUCTION# (C^{14}) AFTER 24-HOUR INCUBATION JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
26 Apr	1500	3.0	15.0	31.77	5.50	18.56	1.85	0.58	29.00	1.39	0.91	36.11	1.54	1.14
26 Apr	2215	3.1	14.4	25.80	2.93	15.63	5.79	0.61	50.11	1.22	1.94	26.29	2.35	1.02
2 May	1145	6.8	12.6	222.76	119.29	287.85	1.19	1.29	263.08	12.30	1.18	244.64	142.06	1.10
2 May	2325	6.8	10.6	66.60	18.71	23.83	2.83	0.36	89.39	38.61	1.34	54.28	8.42	0.82
10 May	945	4.3	14.7	47.48	4.23	23.25	3.57	0.49	38.65	2.30	0.81	29.61	0.01	0.62
10 May	2145	5.5	14.5	89.35	47.59	161.32	2.76	1.81	146.36	6.61	1.64	188.77	1.89	2.11
23 May	1155	9.5	14.0	9.77	2.26	15.59	1.63	1.60	38.08	1.51	3.90	21.54	1.76	2.20
23 May	2155	11.0	9.5	85.76	11.08	49.16	34.44	0.57	15.78	2.40	0.18	59.62	1.76	0.70
14 Jun	1015	10.4	14.4	278.87	5.40	32.16	1.90	0.12	96.50	9.40	0.35	217.20	19.90	0.78
14 Jun	2200	9.5	14.3	67.44	7.36	61.00	3.66	0.90	59.37	5.60	0.88	103.30	52.86	1.53
15 Sep	1100	18.2	0.3	31.07	5.59	17.20	8.96	0.55	49.19	2.22	1.58	27.51	1.19	0.89
15 Sep*	2145	18.2	0.2	83.80	4.38	112.88	20.28	1.35	114.72	84.13	1.37	46.39	10.32	0.55
27 Sep	1100	9.1	4.4	3.90	0.90	53.83	7.56	13.80	22.16	7.82	5.68	17.03	2.00	4.37
27 Sep	2215	12.0	6.1	62.00	9.40	74.40	10.56	1.20	75.42	9.95	1.22	43.43	3.82	0.70
10 Oct	1045	13.3	12.0	90.52	24.42	156.41	8.27	1.73	175.75	60.36	1.94	191.51	24.00	2.12
10 Oct	2145	13.1	10.1	68.94	8.65	91.61	25.48	1.33	99.93	10.93	1.45	80.82	13.60	1.17
24 Oct	1105	11.1	14.7	56.41	20.59	34.26	0.63	0.61	65.78	13.39	1.17	45.18	2.06	0.80
24 Oct	2145	11.7	15.7	84.44	15.36	59.78	12.40	0.71	26.20	22.23	0.31	65.84	4.16	0.78
11 Nov	1045	11.3	16.8	120.43	0.41	153.16	19.46	1.27	114.38	9.01	0.95	71.11	2.72	0.59
11 Nov	2100	6.2	16.8	21.61	4.42	19.90	13.22	0.92	27.96	1.57	1.29	23.20	3.31	1.07
20 Nov	1045	8.3	16.4	49.99	4.54	28.35	1.36	0.57	30.31	6.81	0.61	44.73	4.59	0.89
20 Nov	2000	8.1	16.5	19.11	2.31	32.29	10.14	1.69	65.98	12.26	3.45	55.82	14.42	2.92
12 Dec	1031	5.0	14.0	36.73	5.40	48.04	6.47	1.31	63.85	6.26	1.74	44.95	11.00	1.22
12 Dec	2035	4.4	14.8	66.68	17.75	78.01	11.33	1.17	60.77	7.76	0.91	92.86	19.36	1.39
19 Dec	1140	3.0	15.3	41.33	3.66	34.81	4.55	0.84	37.67	4.37	0.91	44.92	2.74	1.09
19 Dec	2100	3.1	15.9	26.44	0.10	38.52	1.61	1.46	43.03	5.55	1.63	48.72	4.27	1.84

*Samples representing the 24-hr incubation were incubated for 37.5 hrs.

#mg of C/m^3/incubation period

Table J-17

PRIMARY PRODUCTION (C^{14}) AFTER 48-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977[†]

DATE	DAY[a] NIGHT[b]	INTAKE[c] TEMP. (°C)	ΔT[d]	INTAKE			DISCHARGE			3°C SIMULATION			2°C SIMULATION		
				R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN
5 JAN	1110	3.2	17.1	0.83	0.30	0.56	0.53	0.52	0.52	0.61	0.61	0.61	0.83	0.54	0.68
	2220	3.6	16.7	1.62	1.54	1.58	1.13	0.81	0.98	0.52	0.46	0.49	0.49	0.40	0.44
19 JAN	1050	0.5	18.5	1.53	1.96	1.74	1.45	1.46	1.46	1.40	1.68	1.54	1.37	1.54	1.46
	2230	0.6	17.9	1.90	2.27	2.08	1.48	1.25	1.36	1.63	1.86	1.74	1.73	1.46	1.60
7 FEB	1130	3.9	12.2	0.52	0.62	0.57	0.57	0.88	0.72	0.59	0.83	1.42	0.53	0.50	0.52
	2205*	1.3	18.3	0.63	0.54	0.58	1.04	0.80	0.92	0.37	0.39	0.38	0.50	0.46	0.48
16 FEB	1106	1.8	19.9	0.18	0.45	0.32	0.53	0.79	0.66	0.52	0.47	0.50	0.51	0.60	0.56
	2135	2.5	19.0	0.18	0.33	0.26	0.30	0.42	0.36	0.45	0.51	0.48	0.17	0.38	0.28
7 MAR	1035	6.3	14.9	0.53	1.50	1.02	0.54	1.60	1.07	0.81	0.77	0.79	1.50	1.48	1.49
	2047	2.3	11.3	2.93	1.65	2.29	1.49	1.78	1.64	1.64	2.41	2.02	1.33	0.98	1.16
21 MAR	1031**	1.0	18.2	7.18	7.69	7.44	8.76	7.64	8.20	7.46	7.26	7.36	7.63	7.93	7.78
	2034	1.3	17.5	4.20	5.49	4.84	4.09	2.29	3.19	5.17	2.58	3.89	3.80	3.56	3.68

[a/b] Time in 2400 hrs.
[c] Intake temperature before tempering.
[d] Discharge temperature minus intake temperature.

Note: R-1 and R-2 represent the average of light bottles minus the dark bottles.
*Sampled for 56 hours
**Sampled for 35 hours

[†] Viability data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-18

PRIMARY PRODUCTION# (C^{14}) AFTER 48-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
26 Apr	1500	3.0	15.0	57.19	5.64	20.87	0.32	0.36	28.17*	0.00	0.49	98.37	29.73	1.72
26 Apr	2215	3.1	14.4	52.75	2.85	39.30	0.07	0.75	88.00	13.59	1.67	70.27	12.18	1.33
2 May	1145	6.8	12.6	282.89	16.37	265.70	33.86	0.94	450.41	53.39	1.59	425.83	10.88	1.51
2 May	2325	6.8	10.6	99.88	0.93	121.88	0.30	1.22	175.86	43.56	1.76	104.58	33.59	1.05
10 May	945	4.3	14.7	45.74	4.54	35.78	3.47	0.78	44.50	1.16	0.97	55.82	0.79	1.22
10 May	2145	5.5	14.5	214.92	25.60	41.14	0.00	0.19	200.16	45.03	0.93	270.29	7.40	1.26
23 May	1155	9.5	14.0	25.58	3.44	31.95	2.03	1.25	58.34	10.48	2.28	78.20	7.24	3.06
23 May	2155	11.0	9.5	125.95	0.71	76.39	22.94	0.61	42.33	0.37	0.34	93.89	0.86	0.75
14 Jun	1015	10.4	14.4	458.64	15.91	70.38	11.38	0.15	226.33	6.77	0.49	370.03	0.48	0.81
14 Jun	2200	9.5	14.3	131.78	28.70	124.46	9.03	0.94	136.51	18.10	1.04	193.33	40.27	1.47
15 Sep	1100	18.2	0.3	76.04	23.38	54.63	2.49	0.72	103.99	5.68	1.37	69.38	1.05	0.91
15 Sep	2145	18.2	0.2	99.73	11.75	145.22	15.23	1.46	164.53	120.21	1.65	63.01	11.49	0.63
27 Sep	1100	9.1	4.4	14.01	6.33	21.99	6.62	1.57	57.51	33.00	4.10	37.08	1.33	2.65
27 Sep	2215	12.0	6.1	119.39	28.25	131.80	29.38	1.10	131.47	14.10	1.10	138.54	12.52	1.16
10 Oct	1045	13.3	12.0	141.60	33.46	301.22	66.97	2.13	254.88	163.48	1.80	284.47	2.31	2.01
10 Oct	2145	13.1	10.1	130.71	7.16	244.31	51.71	1.87	238.54	28.51	1.82	154.75	4.12	1.18
24 Oct	1105	11.1	14.7	154.81	69.82	106.44	12.85	0.69	157.45	15.59	1.02	128.25	14.87	0.83
24 Oct	2145	11.7	15.7	120.56	19.09	97.65	17.79	0.81	96.92	1.87	0.80	105.40	3.85	0.87
11 Nov	1045	11.3	16.8	281.77	18.96	237.75	38.98	0.84	257.53	3.43	0.91	144.39	13.36	0.51
11 Nov	2100	6.2	16.8	42.44	3.29	40.99	6.71	0.97	50.54	4.84	1.19	41.41	6.74	0.98
20 Nov	1045	8.3	16.4	73.10	0.86	45.15	0.02	0.62	75.61	3.45	1.03	76.41	7.34	1.05
20 Nov	2000	8.1	16.5	36.46	1.31	54.96	9.67	1.51	106.78	15.53	2.93	100.50	14.54	2.76
12 Dec	1031	5.0	14.0	72.92	6.00	84.82	7.13	1.16	120.94	11.68	1.66	87.72	21.64	1.20
12 Dec	2035	4.4	14.8	126.06	19.59	128.03	5.35	1.02	64.16	64.16	0.51	142.14	30.31	1.13
19 Dec	1140	3.0	15.3	125.31	15.71	96.49	7.17	0.77	83.22	4.92	0.66	79.55	7.94	0.63
19 Dec	2100	3.1	15.9	68.41	10.36	84.90	15.48	1.24	73.00	11.53	1.07	88.82	22.10	1.30

*Replicate 1 missing

#mg of C/m^3/incubation period

Table J-19

PRIMARY PRODUCTION (C^{14}) AFTER 72-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977*

DATE	DAY[a] NIGHT[b]	INTAKE[c] TEMP. (°C)	ΔT[d]	INTAKE R-1	INTAKE R-2	INTAKE MEAN	DISCHARGE R-1	DISCHARGE R-2	DISCHARGE MEAN	3°C SIMULATION R-1	3°C SIMULATION R-2	3°C SIMULATION MEAN	2°C SIMULATION R-1	2°C SIMULATION R-2	2°C SIMULATION MEAN
5 JAN	1110	3.2	17.1	0.45	0.58	0.52	0.56	0.59	0.58	0.73	0.57	0.65	0.56	0.42	0.49
	2220	3.6	16.7	0.38	0.26	0.32	0.46	0.97	0.72	0.47	0.34	0.40	0.36	0.51	0.44
19 JAN	1050	0.5	18.5	1.49	1.66	1.58	1.11	1.04	1.08	1.48	2.04	1.76	1.39	1.34	1.36
	2230	0.6	17.9	1.66	2.02	1.84	1.11	1.04	1.08	1.61	0.89	1.25	0.75	1.52	1.14
7 FEB	1130	3.9	12.2	0.31	0.33	0.32	0.22	0.25	0.24	0.36	0.43	0.40	0.37	0.40	0.38
	2205	1.3	18.3	0.41	0.59	0.50	0.38	0.50	0.44	0.33	0.34	0.34	0.24	0.23	0.24
16 FEB	1106	1.8	19.9	0.59	0.44	0.52	0.32	0.33	0.32	0.36	0.29	0.32	0.19	0.38	0.28
	2135	2.5	19.0	0.33	0.17	0.25	0.02	0.32	0.17	0.15	0.22	0.18	0.19	0.22	0.20
7 MAR	1035	6.3	14.9	0.60	0.43	0.52	0.36	0.60	0.48	0.28	0.36	0.32	0.41	0.51	0.46
	2047	2.3	11.3	2.67	3.43	3.05	3.78	0.83	2.30	1.94	0.74	1.34	0.93	1.62	1.28
21 MAR	1031	1.0	18.2	9.49	10.85	10.17	5.13	2.64	3.89	7.17	7.70	7.44	7.68	8.31	8.00
	2034	1.3	17.5	4.65	5.81	5.23	1.64	2.23	1.94	4.87	4.57	4.72	4.69	3.72	4.20

[a/b] Time in 2400 hrs.
[c] Intake temperature before tempering.
[d] Discharge temperature minus intake temperature.

Note: R-1 and R-2 represent the average of light bottles minus the dark bottles.

*Viability data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-20

PRIMARY PRODUCTION# (C^{14}) AFTER 72-HOUR INCUBATION
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Date	Time	Intake Temp (°C)	ΔT	Intake Mean	Intake S.E.	Discharge Mean	Discharge S.E.	D/I Ratio	3° Simulation Mean	3° Simulation S.E.	3° S/I Ratio	2° Simulation Mean	2° Simulation S.E.	2° S/I Ratio
26 Apr	1500	3.0	15.0	54.03	10.73	2.80*	2.78	0.05	55.88	35.47	1.03	78.16	52.12	1.45
26 Apr	2215	3.1	14.4	80.90	13.65	21.19	18.99	0.26	99.26	2.87	1.23	53.72	34.52	0.66
2 May	1145	6.8	12.6	131.97*	0.00	184.75	5.99	1.40	162.29	5.65	1.23	211.58*	0.00	1.60
2 May	2325	6.8	10.6	192.39	11.92	186.76	10.43	0.97	158.09	12.13	0.82	154.04	41.85	0.80
10 May	945	4.3	14.7	94.80	6.86	85.70	0.39	0.90	93.66	3.69	0.99	124.30	12.39	1.31
10 May	2145	5.5	14.5	209.51	60.13	198.08	20.39	0.95	220.20	29.62	1.05	264.12	9.75	1.26
23 May	1155	9.5	14.0	0.00**	0.00	0.00**	0.00	0.00	0.00**	0.00	0.00	0.00**	0.00	0.00
23 May	2155	11.0	9.5	198.55	4.25	79.25	15.31	0.40	79.15	8.30	0.40	126.24	13.71	0.64
14 Jun	1015	10.4	14.4	397.06	8.89	93.96	17.45	0.24	198.95	97.33	0.50	364.67	322.38	0.92
14 Jun	2200	9.5	14.3	175.01	28.07	118.16	14.74	0.68	167.49	8.00	0.96	175.46	5.81	1.00
15 Sep	1100	18.2	0.3	92.67	0.43	48.13	6.46	0.52	105.87	11.79	1.14	140.53	12.43	1.52
15 Sep	2145	18.2	0.2	51.13	7.30	48.89	6.53	0.96	59.54	34.74	1.16	32.56	0.63	0.64
27 Sep	1100	9.1	4.4	43.89	1.81	105.64	49.79	2.41	69.61	34.55	1.59	89.23	16.17	2.03
27 Sep	2215	12.0	6.1	85.59	16.24	95.76	1.32	1.12	113.25	37.66	1.32	81.32	5.37	0.95
10 Oct	1045	13.3	12.0	240.37	42.46	558.40	119.64	2.32	483.83	242.06	2.01	523.31	40.94	2.18
10 Oct	2145	13.1	10.1	230.26	62.95	303.13	61.59	1.32	197.45	20.72	0.86	192.92	30.14	0.84
24 Oct	1105	11.1	14.7	287.51	101.84	159.42	15.68	0.55	347.57	31.73	1.21	251.28	18.84	0.87
24 Oct	2145	11.7	15.7	143.98	11.98	125.43	20.07	0.87	131.17	8.37	0.91	152.55	13.85	1.06
11 Nov	1045	11.3	16.8	286.12	16.47	286.97	33.66	1.00	267.88	38.46	0.94	167.57	20.10	0.59
11 Nov	2100	6.2	16.8	42.46	9.04	49.03	4.88	1.15	46.35	9.54	1.09	47.03	11.12	1.11
20 Nov	1045	8.3	16.4	111.56	9.35	62.30	0.52	0.56	86.86	2.39	0.78	130.53	13.32	1.17
20 Nov	2000	8.1	16.5	100.93	22.05	46.86	2.97	0.46	87.45	12.38	0.87	95.21	10.35	0.94
12 Dec	1031	5.0	14.0	97.67	8.85	99.28	7.70	1.02	153.69	13.61	1.57	102.70	16.32	1.05
12 Dec	2035	4.4	14.8	20.20	5.66	21.85	1.85	1.08	29.95	3.20	1.48	31.66	8.71	1.57
19 Dec	1140	3.0	15.3	116.03	7.83	114.08	6.07	0.98	139.50	24.94	1.20	46.19	46.19	0.40
19 Dec	2100	3.1	15.9	60.72	4.53	90.07	15.32	1.48	73.11	23.28	1.20	101.52	9.43	1.67

*Replicate 2 missing

**Sample not analyzed, sample spilled

#mg of C/m^3/incubation period

Table J-21

PERCENT RELATIVE ABUNDANCE OF ZOOPLANKTON (DAY) IN ENTRAINMENT SAMPLES
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

Taxa	Jan 5-6	Jan 19-20	Feb 7-8	Feb 16-17	Mar 7,9	Mar 21	Apr 15	Apr 27	May 13	May 25	Jun 15	Jun 27	Jul 7	Jul 27	Aug 10	Aug 26	Sep 13	Sep 29	Oct 13	Oct 27	Nov 10	Nov 22	Dec 8	Dec 27	Annual Mean
PROTOZOA																									
CILIATA																									
Tintinnidae											T		1	T	T	T						T		T	T
Vorticellidae	1	T		T		2		7	T					T					T		T	T		L	T
Epistylidae	4							T																	T
Condonella cratera	T			1																					T
SARCODINA																									
Difflugia sp.			T																						T
Difflugiidae														9											T
SUCTORIA																									
Acineta sp.			T		1	1																			T
Thecacineta sp.		1	T	1	1																				T
Acinetidae								5	1		1		T	T					T	2	2	T	T	1	T
Suctoria unid.							3																		T
MASTIGOPHORA																									
Mastigophora unid.							1																		T
Protozoa unid.							T																		T
ROTIFERA																									
Keratella cochlearis								1	1	7	28	T			1	18	1	5	6	5	7	17	5	12	Y
K. hiemalis						1		1	1	T	T							1	5	2	T	T	T	T	2
K. quadrata	2	1	1		1	1		1	1	8	8	4	6	5	8	4		1	2	1	1	3	1	1	4
K. earlinea		T				2		1	1	6	4	51	6	5	5	1	1	6	5	3	2	10	1	12	24
K. crassa	5	2	2	T	1								1	8	4	11	15	7	2	2	3	6	9	4	3
Keratella sp.							3																		T
Brachionus anuglaris		T			1				1	1			T	1	T	T									T
B. calyciflorus									T	3						T									T
B. quadridentata										T															T
Brachionus sp.												T					T								T
Kellicottia lenzispina	1	T	1		1	2		3	T	1	7	T	8	3	4	3	T	1	2	1	T	4	1	4	2
Kellicottia sp.							5					T													T
Notholca acuminata	1					2							T												T
N. squamula							1	1	6	3	1														T
Notholca sp.						4										T		T			1	T		1	T
Monostyla sp.																			T						
Trichotria sp.																							T		
Colurella sp.																						1			
Cephalodella sp.																T								T	T
Conochilus unicornis									T		T	18	13	2			1								9
Filinia longiseta									T	2		T					T								T
Ascomorpha eucaudis																	T	2		T					T
Asplanchna priodonta	1																								T
Asplanchna sp.										1	2		2				2	1	T	T	T	2	T	1	1
Asplanchnidae												1													T
Polyarthra vulgaris	1	2		1	1	1		T			T	2	6	8	T	21	57	8	10	16	7	20		7	10
P. dolichoptera	1	T		T					18	28	3	7	2			1						1			6
P. major														1		14	2	9	1	4	4	2			1
P. euryeptera																1		T							T
Polyarthra sp.							2								T	T									T
Synchaeta lackowitziana	6	6	9	7	4	6																			T
S. pectinata	1	2																							
Synchaeta sp.								6	63	30	2	4	1	1		8	1		T	T	8	T		3	6
Trichocerca multicrinis			T																						T
Trichocerca sp.													2	9	1	2	3	T		1	2				1
Ploesoma sp.													2	1		T	15	T							2
Collotheca sp.																		1	4	4	2	1	T		T
Bdelloida (Order)		T		T									T	1	T	1			1		T	T		5	T
Rotifera unid.							5	1	2	2	1					1	T				1		2	T	T

Table J-21 (CONTD)

PERCENT RELATIVE ABUNDANCE OF ZOOPLANKTON (DAY) IN ENTRAINMENT SAMPLES JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		Annual
	5-6	19-20	7-8	16-17	7-9	21	15	27	13	25	15	27	7	27	10	26	13	29	13	27	10	22	8	27	Mean
ARTHROPODA																									
CLADOCERA																									
Bosmina longirostris	4	3	1																						T
Bosminidae							1			T	12	3	34	8	1	1	1	6	11	10	5	6	13	6	8
Eubosmina coregoni				1										T											T
Alona quadrangularis							–														1				T
Camptocercus rectirostris														T											T
Chydorus sphaericus						1				T		T		2	T									1	1
Daphnia galeata mendotae																								1	T
D. retrocurva									T					5	2	T		7	1	1	1		T	T	T
D. pulex														T											T
Daphnia sp.															T	1		6	2	1	T	T			T
Ceriodaphnia reticulata																		1							T
Ceriodaphnia sp.																									T
Diaphanosoma leuchtenbergianum																				T					T
Cladocera immature														2	1	T	1	4	3	1	T	1	T	T	T
CALANOIDA (COPEPODA)																									
Diaptomus oregonensis																		T	3	1		T		2	T
D. ashlandi																T									T
D. sicilis																			T						T
Diaptomus sp.				41																					T
Eurytemora affinis																				T	3		2		T
Limnocalanus macrurus	T		T	4	1	1	1																		T
Calanoida juvenile	1		1	5	2	7	6	8	1	T	T	T	T	2		1	1	6	17	12	37	16	59	13	2
CYCLOPOIDA																									
Cyclops bicuspidatus thomas	1	2	3	1	3	6	11	17			1	T	1	6	13	T		2	3	3		2	4	2	1
C. vernalis														2	1				T						T
Mesocyclops edax																		1							T
Tropocyclops prasinus mexicana	T	1	1	1														T	T		1	T			T
Cyclopoida juvenile	52	63	59	50	61	35	49	21	T	1	9	2	5	9	53	4	1	17	15	21					5
Copepoda napulii	18	16	21	27	23	28	15	28	6	6	23	6	9	12	6	7	1	8	7	9	6	6	T	20	8
HARPACTICOIDA																									
Harpacticoida Juvenile						1																			T
Total Density (No./m^3)	5,697	8,142	7,875	4,896	5,945	4,100	9,638	6,454	111,316	354,251	417,502	2,086,001	657,195	282,904	72,544	125,706	595,714	35,841	1,584	44,489	6,189	134,055	53,075	10,649	

Table J-22

PERCENT RELATIVE ABUNDANCE OF ZOOPLANKTON (NIGHT) IN ENTRAINMENT SAMPLES
JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

	Jan	Feb	Mar	Apr 19	Apr 28	May 11	May 26	Jun 17	Jun 28	Jul 14	Jul 27	Aug 10	Aug 26	Sep 13	Sep 29	Oct 14	Oct 27	Nov 11	Nov 23	Dec 8	Dec 29	Annual Mean
PROTOZOA																						
CILIATA																						
Tintinnidae							T						T	1				T	3			T
Vorticellidae				3	3	T															1	T
Epistylidae																						
Condonella cratera																						
SARCODINA																						
Difflugia sp.																						
Difflugiidae										20	46	1	1									5
SUCTORIA																						
Acineta sp.																						
Thecacineta sp.																						
Acinetidae				3	T		T	1	T	1		T			T			2			T	T
Suctoria unid.	NO																					
MASTIGOPHORA																						
Mastigophora unid.	SAMPLES																					
Protozoa unid.																						
ROTIFERA	REQUIRED																					
Keratella cochlearis				1	4	4	2	4		T	T	4	24	1	3	2	2	18	11	9	20	2
K. hiemalis				1	1	T	1								T	1	T	T			1	T
K. quadrata				1	6	2	11	6	7	1	5	16	4		1	T	1		1	1	1	5
K. earlinea				1	3	2	6	16	35	14	3	2	4	2	1	2	2	3	2	4	8	22
K. crassa										1	3	5	17	26	12	3		2	5	5	3	2
Keratella sp.																						
Brachionus angularis					1	T	1			T	T											T
B. calyciflorus					5	2	2															T
B. quadridentata						T				T											T	T
Brachionus sp.								T														T
Euchlanis dilatata								T														T
Euchlanis sp.							1															T
Kellicottia longispina				4	1	1	1	6	2	1	5	14	1	1	2	1	T	T	3	3	4	2
Kellicottia sp.									1													T
Notholca acuminata																						
N. squamula																						
Notholca sp.				1	6	5	5	T							T				T		1	T
Lecane sp.					T																	T
Monostyla sp.																						
Trichotria sp.					T																	T
Colurella sp.																						
Cephalodella sp.												T									T	T
Conochilus unicornis						T		T	30	23	T											18
Filinia longiseta				T	T	1							1	T								T
Ascomorpha eucaudis															1							T
Ascomorpha sp.																						
Asplanchna priodonta																						
Asplanchna sp.					T	T	T	3						1	2	T	T	T	3	1	T	T
Asplanchnidae									2													1
Polyarthra vulgaris				1	T			T	T	11	9	9	19	36	6	11	11	20	19		5	5
P. dolichoptera					3	8	15	4	4	1	T								1	T		3
P. major										T	1	2	6	2	3	5	4	3	4			1
P. euryeptera											1			T		T						T
Polyarthra sp.																						
Synchaeta lackowitziana																						
S. pectinata																						
Synchaeta sp.				1	23	68	43	7	5	2	T	T	7			T		12	1		2	7
Trichocerca multicrinis																						
Trichocerca sp.								T	1	1	4	T	2	2	1	T	1		1	T		1
Ploesoma sp.									T	11	1		T	16	1							1
Collotheca sp.													T	T		2	1	1	2	T		T
Bdelloida (Order)								T		T		1	T	T		T					15	T
Rotifera (unid)				1	2	1			1	T			1					T	8		10	17

Table J-22 (CONTD)

PERCENT RELATIVE ABUNDANCE OF ZOOPLANKTON (NIGHT) IN ENTRAINMENT SAMPLES JAMES A. FITZPATRICK NUCLEAR POWER PLANT, 1977

	Jan	Feb	Mar	Apr 19	Apr 28	May 11	May 26	Jun 17	Jun 28	Jul 14	Jul 27	Aug 10	Aug 26	Sep 13	Sep 29	Oct 14	Oct 27	Nov 11	Nov 23	Dec 8	Dec 29	Annual Mean
ARTHROPODA																						
CLADOCERA																						
Bosmina longirostris																						
Bosminidae																						
Eubosmina coregoni				1	T	T	1	14	7	6	5	1	T	3	15	17	10	3	8	22	5	7
Alona quadrangularis											T				T							T
Alona sp.												1	T									T
Camptocercus rectirostris													T									T
Chydorus sphaericus																						
Daphnia galeata mendotae									T	1	T		T	1	T						T	T
D. retrocurva		NO																			T	T
D. pulex										1	1		T	2	3	T	1	1	1	1		T
Daphnia sp.		SAMPLES			2						T	1										T
Ceriodaphnia reticulata								T				20	1		5	5	2		1	1		1
Ceriodaphnia sp.		REQUIRED				T																T
Diaphanosoma leuchtenbergianum													T		T	T		T				T
Cladocera immature					1			T			2	3	T	1	1	2	1	1	2	1	T	T
CALANOIDA (COPEPADA)																						
Diaptomus oregonensis															T	1	1	T	T	T	1	T
D. ashlandi					T											T	T					T
D. sicilis				1	1													T				T
Diaptomus sp.				1	T																	T
Eurytemora affinis				T							1	T		T	T	1	1	T				T
Limnocalanus macrurus				1														T				T
Calanoid juvenile				8	3	T	T	T		L			1	3	10	36	11	15	15	38	13	3
CYCLOPOIDA (COPEPODA)																						
Cyclops bicuspidatus thomasi				40	8	T	1	1	T		4	1	T		T	2	4	1	1	3	1	1
C. vernalis											T	1						T				T
Mesocyclops edax																						
Tropocyclops prasinus mexicana				T	T								T		T	1	1	T			1	T
Cyclopoida juvenile				22	14	1	4	11	4	2	3	9	2	1	14		38					4
HARPACTICOIDA																						
Harpacticoida Juvenile																					T	T
Copepoda napulii				9	14	4	6	24	1	3	6	10	6	1	18	8	8	17	8	10	9	5
TARDIGRADA																						
Tardigrada (unid)																						
Total Density (No./m^3)				5,869	31,701	172,233	197,161	519,608	3,578,695	416,100	533,682	41,555	142,652	251,345	51,238	358,889	40,630	18,394	162,133	40,735	17.038	

Table J-23

ABUNDANCE* OF ZOOPLANKTON AT THE DISCHARGE AFTBAY (DAY SAMPLES), JAMES A. FITZPATRICK NUCLEAR POWER PLANT, JAN-MAR 1977†

SPECIES	5-6 JAN			19-20 JAN			7-8 FEB			16-17 FEB			7,9 MAR			21 MAR		
	R-1**	R-2**	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN
PROTOZOA																		
SARCODINA																		
Difflugia sp.								50	25.0									
SUCTORIA																		
Acineta sp.								50	25.0					65	32.5	98		49.0
Paracineta sp.																		
Staurophrya elegans																		
Thecacineta sp.				70	33	51.5		50	25.0	103		51.5	92	65	78.5			
Tokophrya sp.																		
CILIATA																		
Codonella cratera		41	20.5							103		51.5						
Epistylidae		410	205.0															
Vorticellidae	42	123	82.5	70		35.0					44	22.0					186	93.0
ROTIFERA																		
Ascomorpha eucaudis																		
Asplanchna priodonta	42	41	41.5															
Bdelloidea (order)					33	16.5					44	22.0						
Brachionus angularis					33	16.5							92		46.0			
B. caudatus																		
B. calyciflorus																		
B. havanaensis																		
B. quadridentatus																		
B. urceolaris																		
Cephalodella sp.																		
Chromogaster ovalis																		
Collotheca mutabilis																		
Colurella sp.																		
Conochilus unicornis																		
Conochiloides sp.																		
Euchlanis dilatata																		
Euchlanis sp.																		
Filinia longiseta																		
Hexarthra sp.																		
Kellicottia longispina		82	41.0		66	33.0	76	100	88.0					65	32.5	147		73.5
Keratella crassa		533	266.5	210	66	138.0	228	100	164.0		44	22.0		65	32.5			
K. hiemalis																49		24.5
K. cochlearis																		
K. earlinae				70		35.0										147		73.5
K. quadrata		205	102.5	70	33	51.5	76	100	88.0					130	65.0	49		24.5
K. valga																		
Lecane sp.																		
Notholca acuminata		82	41.0													196		98.0
N. foliacea																		
N. squamula																294		147.0
N. str[illegible]																		

Table J[illegible] (CONTD)

ABUNDANCE* OF ZOOPLANKTON AT THE DISCHARGE AFTBAY (DAY SAMPLES), JAMES A. FITZPATRICK NUCLEAR POWER PLANT, JAN-MAR 1977[1]

	5-6 JAN			19-20 JAN			7-8 FEB			16-17 FEB			7,9 MAR			21 MAR		
SPECIES	R-1**	R-2**	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN	R-1	R-2	MEAN
ROTIFERA (Continued)																		
Ploesoma lenticulare																		
P. hudsoni																		
P. truncatum																		
Ploesoma sp.																		
Polyarthra vulgaris		82	41.0	280	66	173.0				103		51.5		65	32.5	49		24.5
P. dolichoptera	84	82	83.0		33	16.5					44	22.0						
P. euryptera																		
P. major																		
P. remata																		
Polyarthra sp.																		
Synchaeta lackowitziana	42	656	349.0	490	429	459.5	760	600	680.0	412	264	338.0	368	65	216.5	441	62	251.5
S. pectinata		123	61.5	70	297	183.5												
S. tremula									0									
S. stylata																		
Trichocerca multicrinis								50	25.0									
T. cylindrica																		
Trichotria sp.																		
COPEPODA (ARTHROPODA)																		
Copepod nauplii	294	1763	1028.5	1120	1518	1319.0	1520	1750	1635.0	824	1804	1314.0	1472	1235	1353.5	1127	1178	1152.5
CALANOIDA																		
Diaptomus spp.											88	44.0						
Eurytemora affinis																		
Calanoid - juvenile	42	82	62.0				76	50	63.0	103	352	227.5	92	195	143.5	392	186	289.0
Limnocalanus micrurus		41	20.5				76		38.0	309	44	176.5		130	65.0	49		24.5
CYCLOPOIDA																		
****Acanthocyclops vernalis*																		
****Diacyclops bicuspidatus thomasi*	84	82	83.0	140	132	136.0		450	225.0		88	44.0	92	260	176.0	343	186	264.5
Tropocyclops prasinus mexicanus		41	20.5	70	33	51.5		100	50.0					130	65.0			
Cyclopoid - juvenile	882	4961	2921.5	4760	5544	5152.0	4712	4600	4656.0	1442	3476	2459.0	3312	3900	3606.0	1470	1426	1448.0
HARPACTICOIDA																		
Harpacticoid - juvenile																	62	31.0
CLADOCERA (ARTHROPODA)																		
Alona affinis																		
Alona guttata																		
Bosmina longirostris	42	410	226.0	350	198	274.0	76	100	88.0									
Ceriodaphnia lacustris																		
Chydorus sphaericus																	62	31.0
Daphnia longiremis																		
Daphnia retrocurva																		
Daphnia sp.																		
Eubosmina coregoni										100		50.0						
Leydigia quadrangularis																		
Total density (No./m^3)			5697			8142			7875			4896			5945			4100

*Number of organisms/m^3, day collections.
**R-1 & R-2 = Replicates 1 & 2
***Subgenus of *Cyclops*

[1]Zooplankton entrainment data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

Table J-24

NUMBER OF TOTAL ZOOPLANKTON COLLECTED IN ENTRAINMENT SAMPLES
JAMES A. FITZPATRICK POWER PLANT, 1977

Day							Night						
Date	Time (0001-2400 hrs)	Intake Temp (°C)	Discharge Temp (°C)	No. Pumps Circ./Ser.*	Density (No./m3)	Standard Error	Date	Time (0-2400 hrs)	Intake Temp (°C)	Discharge Temp (°C)	No. Pumps Circ./Ser.	Density (No./m3)	Standard Error
15 Apr	1349	2.5	17.6	3/1	9,638.1	685.7	19 Apr	2339	3.3	14.3	3/1	5,869.0	6.2
27 Apr	1325	3.7	18.2	3/1	6,453.6	303.6	28 Apr	2200	4.0	19.5	3/1	31,700.9	2,101.0
13 May	0934	5.4	20.8	3/1	111,315.7	19,979.0	11 May	2300	6.0	21.8	3/1	172,232.8	2,385.5
25 May	1117	10.3	24.3	3/1	354,254.5	76,602.1	26 May	2306	8.2	23.6	3/1	197,161.4	11,695.2
15 Jun	1005	8.3	24.0	3/1	417,502.1	56,275.1	17 Jun	0036	13.2	27.3	3/1	519,607.9	13,894.2
27 Jun	1230	15.9	16.1	1/1	2,086,001.0	282,746.0	28 Jun	2217	16.4	16.6	1/1	3,578,695.0	464,475.0
7 Jul	1010	10.8	10.9	1/1	647,195.1	11,089.8	14 Jul	2210	18.8	19.0	1/1	416,100.1	25,804.1
27 Jul	1105	21.8	22.2	1/2	282,904.1	19,899.5	27 Jul	2210	22.0	22.4	1/2	533,681.7	83,015.9
10 Aug	1005	20.8	21.0	1/1	72,543.6	5,043.6	10 Aug	2200	21.4	21.9	1/2	41,555.5	158.7
26 Aug	1110	19.0	19.4	1/2	125,706.1	34,984.1	26 Aug	2200	19.4	19.7	1/2	142,651.7	1,220.8
13 Sep	1112	18.8	19.1	1/1	595,713.7	29,047.4	13 Sep	2200	18.8	19.1	1/1	251,344.7	83.2
29 Sep	0850	12.9	18.7	2/1	35,840.6	19,822.1	29 Sep	2345	12.6	21.0	2/1	51,238.0	5,714.3
13 Oct	1103	12.9	25.6	3/1	26,701.5	1,584.1	14 Oct	2319	12.2	22.5	3/1	35,888.8	3,317.4
27 Oct	1010	11.8	28.2	3/1	44,488.5	5,511.5	27 Oct	2310	12.3	28.9	3/1	40,630.4	6,598.8
10 Nov	1227	5.8	6.1	2/1	6,138.6	574.3	11 Nov	0030	8.3	9.0	1/1	18,394.1	4,112.4
22 Nov	1000	7.6	24.0	3/2	134,055.1	10,203.7	23 Nov	0000	8.4	25.2	3/2	162,133.2	9,570.1
8 Dec	1035	4.0	18.4	3/2	53,075.3	3,992.4	8 Dec	2345	5.3	20.8	3/2	40,735.4	809.5
27 Dec	1043	3.0	21.4	3/1	10,639.7	3,969.9	29 Dec	2315	2.9	20.6	3/1	17,038.3	1,757.9

*Circulating pumps = 120,000 gpm each; service pumps = 18,000 gpm each.

Table J-25

NUMBER OF TOTAL ZOOPLANKTON IN VIABILITY (DEAD VS. LIVE) SAMPLES*,
JAMES A. FITZPATRICK NUCLEAR PLANT, 1977

DATE	DAY[a] NIGHT[b]	INTAKE[c] TEMP. (°C)	ΔT[d]	INTAKE LIVE[e] R-1#	INTAKE LIVE[e] R-2#	INTAKE TOTAL COLL.[f] R-1	INTAKE TOTAL COLL.[f] R-2	INTAKE % DEAD[g] MEAN	DISCHARGE LIVE R-1	DISCHARGE LIVE R-2	DISCHARGE TOTAL COLL. R-1	DISCHARGE TOTAL COLL. R-2	DISCHARGE % DEAD MEAN	3C SIMULATION LIVE R-1	3C SIMULATION LIVE R-2	3C SIMULATION TOTAL COLL. R-1	3C SIMULATION TOTAL COLL. R-2	3C SIMULATION % DEAD MEAN	2C SIMULATION LIVE R-1	2C SIMULATION LIVE R-2	2C SIMULATION TOTAL COLL. R-1	2C SIMULATION TOTAL COLL. R-2	2C SIMULATION % DEAD MEAN
5 JAN	1135	3.5	17.0	40	101	123	174	53	19	96	37	240	59	45	65	96	166	58	84	58	250	124	62
6 JAN	0000	3.5	17.0	92	42	208	110	58	48	44	116	138	64	79	58	187	205	65	96	29	246	133	69
19 JAN	1150	0.4	18.6	86	214	140	312	33	44	168	111	258	43	48	64	91	154	54	99	112	193	271	55
20 JAN	2335	0.2	18.7	68	66	124	122	46	46	53	120	147	63	72	43	134	103	51	66	58	143	148	57
7 FEB	1235	1.2	18.4	69	72	128	120	43	61	95	100	165	41	64	55	111	111	46	59	59	166	115	58
8 FEB	2346	1.3	18.1	56	42	106	133	59	40	57	72	160	58	24	27	105	102	75	47	52	138	153	66
16 FEB	1200	2.0	20.0	82	53	145	82	41	14	96	33	143	38	63	57	114	123	49	64	51	103	112	47
17 FEB	0000	2.6	19.2	93	29	173	105	56	73	55	128	119	48	42	47	86	78	46	66	91	152	164	50
7 MAR	1125	3.8	17.8	34	66	68	109	44	39	60	60	98	37	24	27	45	79	59	56	45	112	93	51
9 MAR	2300	3.2	13.8	39	38	96	89	58	29	92	61	169	47	25	24	61	64	61	34	30	78	111	66
21 MAR.	1115	3.4	15.9	46	103	100	164	44	53	33	100	54	44	56	62	136	118	54	82	121	146	208	43
	2315	3.4	15.8	60	38	113	75	48	38	45	60	76	39	69	53	119	90	42	48	156	111	231	40

a/b Time in 2400 hrs of intake sample R-1.
c Mean of intake temperatures at stations In R-1 and In R-2.
d Mean of discharge temperatures at stations In R-1 and In R-2 minus "c".
e Number of live organisms observed.
f Total number of organisms observed.
g Mean % dead equal to total of dead observed in R-1 and R-2 divided by total organisms observed in R-1 and R-2.

*Zooplankton entrainment data for Jan-Mar 1977, as supplied by Lawler, Matusky, and Skelly Engineers, Tappan, N.Y.

#Replicate samples

Table J-26

NUMBER OF TOTAL ZOOPLANKTON IN VIABILITY (DEAD VS. LIVE) SAMPLES*, JAMES A. FITZPATRICK NUCLEAR PLANT, 1977

		TEMPERATURE		INTAKE NUMBER					DISCHARGE NUMBER					3 SIMULATED NUMBER					2 SIMULATED NUMBER				
				DEAD		TOTAL		%	DEAD		TOTAL		%	DEAD		TOTAL		%	DEAD		TOTAL		%
DATE	TIME*	INT*	DIS*	R-1	R-2	R-1	R-2	DEAD	R-1	R-2	R-1	R-2	DEAD	R-1	R-2	R-1	R-2	DEAD	R-1	R-2	R-1	R-2	DEAD
15 APR	1349	2.5	17.6	33	43	74	74	51.3															
	1353	2.5	17.6						36	31	39	45	79.8										
	1436	2.5	17.6											20	40	33	50	72.3	43	66	70	73	76.2
19 APR	2339	3.3	14.3	26	33	41	68	54.1															
	2344	3.3	14.3						55	31	89	103	70.8										
20 APR	0049	3.3	14.3											63	113	59	137	84.7	137	52	151	61	89.2
27 APR	1325	3.7	18.2	77	57	97	79	76.1															
	1332	3.7	18.2						78	43	91	58	81.2										
	1436	3.2	18.4											61	55	71	71	81.7	39	37	77	53	58.5
28 APR	2200	4.0	19.5	77	131	120	223	60.6															
	2202	4.0	19.5						71	139	103	171	76.6										
	2323	3.8	21.4											58	63	136	84	55.0	146	170	227	214	71.7
11 MAY	2300	6.8	21.8	148	106	331	236	44.8															
	2304	6.8	21.8						205	94	231	211	67.6										
12 MAY	0013	6.8	21.8											131	74	330	197	38.9	206	41	319	114	57.0
13 MAY	0934	5.4	20.8	61	53	206	117	35.3															
	0940	5.4	20.8						42	83	63	150	58.7										
	1115	5.4	20.8											83	93	204	203	43.2	135	152	263	331	48.3
25 MAY	1117	10.3	24.3	161	64	328	1085	15.9															
	1122	10.3	24.3						76	39	146	101	46.6										
	1239	10.3	24.3											45	34	129	152	28.1	96	60	144	279	36.9
26 MAY	2306	8.2	23.6	118	155	274	289	48.5															
	2310	8.2	23.6						72	117	95	162	73.5										
27 MAY	0020	8.2	23.6											101	97	209	219	46.3	216	237	465	356	55.2
15 JUN	1025	8.3	24.0	59	122	184	287	38.4															
	1029	8.3	24.0						84	60	103	148	57.4										
	1135	10.9	23.0											39	40	122	112	33.8	138	178	302	445	42.3
17 JUN	0024	13.2	27.3	70	177	129	309	56.4															
	0028	13.2	27.3						115	104	151	131	77.7										
	0134	13.2	27.2											84	80	162	135	55.2	126	102	221	179	57.0

*EXPLANATION: SAMPLES COLLECTED WITH A PUMP AND A 76 MICRON MESH PLANKTON NET
TIME = MILITARY TIME
TEMPERATURE IN DEGREES CENTIGRADE
INT = INTAKE
DIS = DISCHARGE

Table J-26 (CONTD)

NUMBER OF TOTAL ZOOPLANKTON IN VIABILITY (DEAD VS. LIVE) SAMPLES*, JAMES A. FITZPATRICK NUCLEAR PLANT, 1977

DATE	TIME*	TEMPERATURE* INT	TEMPERATURE* DIS	INTAKE NUMBER DEAD R-1	INTAKE DEAD R-2	INTAKE TOTAL R-1	INTAKE TOTAL R-2	INTAKE % DEAD	DISCHARGE NUMBER DEAD R-1	DISCHARGE DEAD R-2	DISCHARGE TOTAL R-1	DISCHARGE TOTAL R-2	DISCHARGE % DEAD	3 SIMULATED NUMBER DEAD R-1	3 SIM. DEAD R-2	3 SIM. TOTAL R-1	3 SIM. TOTAL R-2	3 SIM. % DEAD	2 SIMULATED NUMBER DEAD R-1	2 SIM. DEAD R-2	2 SIM. TOTAL R-1	2 SIM. TOTAL R-2	2 SIM. % DEAD
13 SEP	1112	18.8	19.1	107	87	182	156	57.4															
	1130	18.8	19.1						36	87	132	111	50.6										
	1215	18.8	19.1											84	57	188	82	52.2	113	84	181	145	60.4
	2300	18.8	19.1	199	160	363	248	58.8															
	2328	18.8	19.1						126	86	212	137	60.7										
14 SEP	0000	18.8	19.1											76	93	115	166	60.1	62	115	164	249	42.9
29 SEP	0850	12.9	18.7	72	66	124	132	53.9															
	0856	12.9	18.7						80	76	164	103	58.4										
	1100	12.9	18.7											54	53	119	98	49.3	75	68	173	158	43.2
	2345	12.6	21.0	122	42	228	113	48.1															
	2351	12.6	21.0						108	75	180	153	55.0										
30 SEP	0100	12.8	22.4											91	86	212	140	50.3	51	132	145	199	53.2
3 OCT	1103	12.9	25.6	40	44	85	81	50.6															
	1155	12.9	25.6						45	69	69	101	67.1										
	1605	12.0	13.1											65	68	116	138	52.4#					
	1630	12.0	13.1																62	56	148	183	35.6#
14 OCT	2319	12.2	22.5	76	122	157	220	52.5															
	2323	12.2	22.5						109	81	168	165	57.1										
15 OCT	0045	12.2	22.5											67	76	175	131	46.7	99	112	206	267	44.6
27 OCT	1010	11.8	28.2	78	108	124	193	58.7															
	1114	11.8	28.2						103	100	124	116	84.6										
	1145	11.8	28.2											69	52	159	126	42.5	108	89	210	163	52.8
	2310	12.3	28.9	94	112	114	207	64.2															
	2314	12.3	28.9						112	182	159	259	70.3										
28 OCT	0015	12.3	28.3											75	77	157	170	46.5	75	126	149	219	54.6
10 NOV	1045	8.5	6.1											50	41	153	75	39.9#					
	1100	9.5	6.1																71	55	102	112	58.9#
	1227	5.8	6.1	43	33	53	53	71.7															
	1233	6.1	6.1						43	38	69	61	62.3										
11 NOV	0030	8.3	9.0	64	45	126	73	54.8															
	0039	9.0	9.0						79	65	108	143	57.4										
	0130	8.3	9.0											110	109	143	136	78.5	67	96	92	130	73.4
22 NOV	1000	7.6	24.0	198	247	456	309	58.2															
	1004	7.6	24.0						292	198	374	262	77.0										
	1200	7.6	24.0											259	174	332	276	71.2	270	346	499	403	68.3
23 NOV	0000	8.4	25.2	293	285	456	355	71.3															
	0004	8.4	25.2						407	190	468	260	82.0										
	0120	8.4	25.2											167	189	210	231	80.7	242	211	320	267	77.2
8 DEC	1030	4.0	18.8	28	29	103	99	28.2															
	1039	4.0	18.8						29	42	101	128	31.0										
	1145	4.0	18.8											32	54	106	275	22.6	55	46	175	174	28.9
	2345	5.3	20.8	83	63	202	151	41.4															
	2349	5.3	20.8						116	144	178	238	62.5										
9 DEC	0100	5.3	20.8											84	41	187	223	30.5	80	64	240	255	29.1
27 DEC	1034	3.0	21.4	45	56	91	65	64.7															
	1038	3.0	21.4						99	77	112	98	83.8										
	1150	3.0	21.4											76	87	104	137	67.6	95	100	147	152	65.2
29 DEC	2315	2.7	20.6	0	0	0	0	0.0															
	2319	2.7	20.6						66	105	124	187	55.0										
30 DEC	0045	2.7	20.6											89	120	147	178	64.3	94	104	156	189	57.4
ANNUAL MEAN																							
DAY				77	78	162	215	41.1	80	73	122	114	64.8	75	68	177	144	44.5	106	111	177	216	55.2##
NIGHT				105	110	195	193	55.4	126	113	174	178	67.9	92	94	188	171	51.8	130	123	188	209	63.4
GRAND				91	94	179	204	48.3	103	93	148	146	66.7	83	81	182	157	48.2	118	117	182	213	59.5

*EXPLANATION: SAMPLES COLLECTED WITH A PUMP AND A 76 MICRON MESH PLANKTON NET
TIME = MILITARY TIME
TEMPERATURE IN DEGREES CENTIGRADE
INT = INTAKE
DIS = DISCHARGE

#SAMPLES TAKEN IN ACTUAL PLUME RATHER THAN SIMULATED (SEE SUBSECTION III-B1)
##ANNUAL MEANS INCLUDE JUST SIMULATION SAMPLES