

THREE MILE ISLAND AQUATIC STUDY

Monthly Report for October 1979

by

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For

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INTRODUCTION

The ecology of York Haven Pond near the Three Mile Island Nuclear Station (TMINS) has been under investigation since February 1974. Studies initiated in April 1974 include analysis of ambient water quality, ichthyoplankton (far-field), ichthyoplankton entrainment, macroinvertebrates, fish population dynamics, impingement of fishes, creel survey, and thermal plume mapping.

This report discusses the progress of investigations conducted in October 1979.

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MACROINVERTEBRATES

Objective: To describe the diversity and distribution of the benthic macroinvertebrates occurring at the five benthos sampling stations near TMINS.

Progress: Replicate (4) benthos samples were taken on 2 and 15 October (Table 1). Enumeration, determination of dry weights, and identification of specimens have been completed through 15 October.

ICHTHYOPLANKTON

Objectives: (1) To determine the species composition, abundance, and distribution of ichthyoplankton in York Haven Pond; and (2) To investigate ichthyoplankton entrained at TMINS Unit 1 and 2 Intakes.

Far-Field

Progress: Computer generation of tables for the 1979 report was completed.

Entrainment

Progress: Data were analyzed in preparation for the 1979 report.

TRAPNET

Objectives: (1) To determine the distribution and relative abundance of fishes in the Three Mile Island area vulnerable to trapnet; (2) To monitor the occurrence of diseased fishes; (3) To provide specimens for radiation analysis; and (4) To determine reproductive status for fishes throughout the year.

Progress: Samples were taken on 15-17 and 24-26 October (Table 1).

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Thirty-two fish of eight species were taken on 15-17 October (Table 2). Most fish (14) occurred at Station 11A3 while most species (6) and greatest biomass (5.18 kg) occurred at Station 1A3. The pumpkinseed was most abundant and comprised 31.3% of the total catch. Three channel catfish and five rock bass were sacrificed for radiation analysis. Two channel catfish were parasitized by leeches. No fish were taken in the 15-16 October collection at Station 9B2.

A total of 103 fish of 10 species was taken on 24-26 October (Table 3). Most fish (50) occurred at Station 11A2 while most species (7) and greatest biomass (12.21 kg) occurred at Station 9B2. The channel catfish comprised 62.1% of the total catch; most were juvenile. Over half of the channel catfish were parasitized by leeches. No fish were taken in the 25-26 October collection at Station 1A3.

No dead fish were observed in October.

SEINE

Objectives: (1) To determine the species composition of fish upstream and downstream from the TMINS Discharge vulnerable to seine; (2) To determine the relative condition factor for important species; and (3) To determine the reproductive status for fishes throughout the year.

Progress: Collections were made at the 10 stations on 16 and 24 October (Table 1). A total of 3,366 fish of 20 species was taken on 16 October (Table 4). Most fish (1,772) were taken at Station 13B5 while most species (12) and greatest biomass (0.34 kg) occurred at

Station 16A1. The spotfin shiner was most abundant and comprised 83.1% of the total catch. The following fishes exhibited slight black spot infections: spotfin shiner (82 specimens); bluntnose minnow (39); fallfish (8); spottail shiner (7); tessellated darter (5); golden shiner (4); swallowtail shiner (2); and common shiner, quillback, and smallmouth bass (1 each). Protozoan infections were observed on eight bluntnose minnow and one comely shiner. One quillback and one pumpkinseed were parasitized by anchor worms and one tessellated darter by leeches. No pattern of parasite infection was observed with respect to the location of TMINS.

Sampling on 24 October yielded 1,076 fish of 15 species (Table 5). Most fish (502) and greatest biomass (0.13 kg) were recorded at Station 10A2 while most species (9) occurred at Station 16A5. The spotfin shiner comprised 87.8% of the total catch; it was the most abundant species at all stations except 4A2. Sixty-one spotfin shiner and three bluntnose minnow exhibited slight black spot infections. No pattern of parasite infection was observed with respect to the location of TMINS.

IMPINGEMENT OF FISH

Objectives: (1) To determine the numbers and species impinged on the river water intake screens; (2) To determine day-night differences in impingement frequency; and (3) To determine the extent of mortality of impinged fish.

Progress: Impingement surveys were conducted at the Unit 1 Intake

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on 24-25 and 30-31 October (Table 1). Unit 1 impinged 9 fish of 5 species weighing 27.2 g (Tables 6 through 9). The total was comprised of 3 young, 5 juvenile, and 1 adult; 5 fish were alive and 4 were dead. Six fish weighing 9.4 g were taken on 24-25 October and 3 fish weighing 17.8 g were taken on 30-31 October. The total estimated impingement from Unit 1 for October was 139.5 fish weighing 421.6 g (0.9 lb).

Impingement surveys were conducted at the Unit 2 Intake on 17-18 and 22-23 October (Table 1). Surveys were not concurrent with those at Unit 1 because of a malfunctioning winch at the Unit 1 screen wash basket which prevented net placement. Unit 2 impinged 41 fish of 7 species weighing 122.9 g (Tables 10 through 13). The total consisted of 24 young, 11 juvenile, and 6 adult; 8 fish were alive and 33 were dead. The total estimated impingement from Unit 2 for October was 635.5 fish weighing 1,905.0 g (4.2 lb).

The total estimated impingement for TMINS in October was 775 fish weighing 2,326.6 g (5.1 lb).

ELECTROFISHING

Objectives: (1) To provide specimens for radiation analysis; and (2) To determine the relative abundance of fishes vulnerable to electrofishing in various parts of York Haven Pond.

Progress: Sampling was conducted on 2, 3, 15, and 16 October (Table 1). Twenty-four collections in twelve zones yielded 1,082 specimens of 22 species (Table 14). The walleye (178 specimens),

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gizzard shad (150), smallmouth bass (150), rock bass (134), quillback (121), and pumpkinseed (107) were most abundant. Two channel catfish, 14 rock bass, and 30 smallmouth bass were taken for radiation analysis.

CREEL SURVEY

Objectives: (1) To determine the extent and success of sport fishing; and (2) To determine information on angler residence and use of catch.

Progress: Creel surveys were conducted in all areas on 10, 14, 24, and 27 October (Table 1). The 128 anglers interviewed fished 189.15 hours and caught 219 fish (Tables 15 through 18). The actual harvest was 102 fish or 46.6% of the total catch. The mean catch per effort (c/e) was 1.16. Most anglers (62), most fish caught (93), most fish harvested (55), and most hours fished (94.80) were recorded at York Haven Generating Station. The highest mean c/e (1.97) was recorded at the West Dam.

Smallmouth bass (102 specimens) were caught in greatest numbers. The walleye (56) and black crappie (28) were also common.

Approximately 74% of the anglers lived in York or Dauphin counties. Most of the anglers reported they eat some of their catch.

AMBIENT WATER QUALITY

Objective: To determine concentrations of selected water quality parameters in ambient river areas and the TMINS effluent.

Progress: Water quality samples were collected on 2 and 15 October

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at the five river stations (Table 1). Data were analyzed and tabulated; results are presented in Table 19.

On 2 October values for pH, turbidity, and total zinc were highest at Station 1A1 (upstream of the TMINS Discharge); total and dissolved copper and dissolved zinc were highest at 1A2. Values for total dissolved solids were highest at Station 9B1.

On 15 October values for dissolved oxygen and total zinc were highest at Station 11A2. Values for dissolved zinc, sulfate, and water temperature were highest at stations 1A2, 11A1 (TMINS Discharge), and 9B1, respectively.

Parameters, for which state water quality criteria have been established, were not exceeded at any station in October.

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Table 1

Sampling conducted in October 1979 near TMINS.

| PROGRAM | Oct 1-6 | Oct 7-13 | Oct 14-20 | Oct 21-27 | Oct 28-31 |
|--------------------------|------------|-------------|--------------|--------------|--------------|
| Macroinvertebrates | X | | X | | |
| Ichthyoplankton: | | | | | |
| Far-Field ¹ | | | | | |
| Entrainment ¹ | | | | | |
| Trapnet | | | X | X | |
| Seine | | | X | X | |
| Impingement of Fish | | | X | X | X |
| Electrofishing | X | | X | | |
| Creel Survey | | X | X | X | |
| Ambient Water Quality | X | | X | | |

¹ Program terminated for 1979 as of 31 August.

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Table 2

Fishes taken by trapnet on 15-17 October 1979 near INNS.

| Station | TM-AQF-1A3 | | TM-AQF-11A2 | | TM-AQF-11A3 | | TM-AQF-9B2 | | Total | % Catch |
|-------------------------|-------------------------|----------------------------|-------------------------|----------------------------|-------------------------|----------------------------|-------------------------|----------------------------|-------|---------|
| | 15-16 1350-1352 | 16-17 1355-1363 | 15-16 1338-1340 | 16-17 1342-1330 | 15-16 1328-1325 | 16-17 1332-1315 | 15-16 1316-1318 | 16-17 1320-1303 | | |
| Date | | | | | | | | | | |
| Time | | | | | | | | | | |
| Air Temp. (C) | 14.5, 15.5 | 15.5, 13.0 | 14.5, 15.5 | 15.5, 13.0 | 14.0, 14.5 | 14.5, 12.5 | 14.5, 13.0 | 13.0, 12.0 | | |
| Water Temp. (C) | 11.5, 11.0 | 11.0, 11.5 | 11.0, 11.0 | 11.0, 11.5 | 11.0, 10.5 | 10.5, 11.0 | 10.5, 10.5 | 10.5, 11.0 | | |
| Dissolved Oxygen (ug/l) | 10.0, 10.8 | 10.8, 10.6 | 10.2, 11.1 | 11.1, 11.0 | 10.2, 10.9 | 10.9, 10.8 | 12.1, 10.9 | 10.9, 11.1 | | |
| pH | 7.2, 7.4 | 7.4, 7.2 | 7.4, 7.2 | 7.2, 7.2 | 7.6, 7.2 | 7.2, 7.2 | 7.4, 7.2 | 7.2, 7.4 | | |
| Secchi Disc (cm) | 56, 76 | 76, 76 | 51, 51 | 51, 76 | 51, 56 | 56, 81 | 56, 71 | 71, 81 | | |
| River Stage (m) | 1.57, 1.51 | 1.51, 1.46 | 1.57, 1.51 | 1.51, 1.46 | 1.57, 1.51 | 1.51, 1.46 | 1.57, 1.51 | 1.51, 1.46 | | |
| Weather | Clear, Partly Cloudy | Partly Cloudy, Overcast | Clear, Partly Cloudy | Partly Cloudy, Overcast | Clear, Partly Cloudy | Partly Cloudy, Overcast | Clear, Partly Cloudy | Partly Cloudy, Overcast | | |
| No. of Specimens | 3 | 8 | 3 | 1 | 6 | 8 | - | 3 | 32 | |
| No. of Species | 2 | 6 | 2 | 1 | 5 | 4 | - | 1 | 8 | |
| Carp | - | 1 | - | - | - | - | - | - | 1 | 3.1 |
| Channel catfish | - | 2 | - | - | 1 | 3 | NO | - | 6 | 18.8 |
| Rock bass | - | 2 | 2 | - | 2 | 2 | - | - | 8 | 25.0 |
| Pumpkinseed | 1 | 1 | 1 | 1 | 1 | 2 | - | 3 | 10 | 31.3 |
| White crappie | 2 | 1 | - | - | - | - | FISH | - | 3 | 9.4 |
| Black crappie | - | - | - | - | 1 | - | - | - | 1 | 3.1 |
| Yellow perch | - | - | - | - | 1 | 1 | - | - | 2 | 6.3 |
| Walleye | - | 1 | - | - | - | - | TAKEN | - | 1 | 3.1 |

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Table 3

Fishies taken by trapnet on 24-26 October 1979 near THHS.

| Station | TH-AQF-1A1 | | TH-AQF-1A2 | | TH-AQF-11A1 | | TH-AQF-9B2 | | Total | % Catch |
|-------------------------|---|--------------------|---|--------------------|-----------------------------------|--------------------|---|--------------------|-------|---------|
| | 24-25 0930-1013 | 25-26 1019-0943 | 24-25 0917-0937 | 25-26 0948-0925 | 24-25 0907-0924 | 25-26 0928-0914 | 24-25 0851-0842 | 25-26 0858-0858 | | |
| Date | | | | | | | | | | |
| Time | | | | | | | | | | |
| Air Temp. (C) | 9.0, 9.5 | 9.5, 5.5 | 8.5, 9.0 | 9.0, 5.5 | 9.0, 9.0 | 9.0, 5.0 | 8.5, 7.5 | 7.5, 5.5 | | |
| Water Temp. (C) | 14.5, 11.5 | 11.5, 9.5 | 14.5, 12.0 | 12.0, 10.0 | 15.0, 12.0 | 12.0, 10.0 | 15.0, 12.0 | 12.0, 10.0 | | |
| Dissolved Oxygen (mg/l) | 10.1, 8.8 | 8.8, 8.9 | 9.8, 9.7 | 9.7, 9.8 | 8.1, 9.2 | 9.2, 9.8 | 8.1, 9.2 | 9.2, 9.8 | | |
| pH | 7.7, 7.9 | 7.9, 7.7 | 7.8, 8.0 | 8.0, 7.4 | 7.6, 7.9 | 7.9, 7.9 | 7.8, 7.9 | 7.9, 7.7 | | |
| Secchi Disc (cm) | 51, 46 | 46, 51 | 41, 38 | 38, 46 | 46, 36 | 36, 46 | 51, 41 | 41, 51 | | |
| River Stage (m) | 1.28, 1.34 | 1.34, 1.33 | 1.28, 1.34 | 1.34, 1.33 | 1.28, 1.34 | 1.34, 1.33 | 1.28, 1.34 | 1.34, 1.33 | | |
| Weather | Partly Cloudy, Partly Cloudy, Partly Cloudy, Partly Cloudy | | Partly Cloudy, Partly Cloudy, Partly Cloudy, Partly Cloudy | | Clear, Partly Cloudy, Clear | | Partly Cloudy, Partly Cloudy, Partly Cloudy, Clear | | | |
| No. of Specimens | 3 | - | 39 | 11 | 9 | 1 | 32 | 8 | 103 | |
| No. of Species | 2 | - | 6 | 3 | 3 | 1 | 6 | 2 | 10 | |
| Carp | - | - | - | - | - | - | - | 2 | 2 | 1.9 |
| Golden shiner | - | - | - | - | 1 | - | - | - | 1 | 1.0 |
| Quillback | 1 | NO | - | - | - | - | - | - | 1 | 1.0 |
| Brown bullhead | - | - | - | - | - | - | - | - | - | - |
| Channel catfish | - | - | 29 | 8 | - | - | 3 | - | 3 | 2.9 |
| Rock bass | 2 | FISH | 4 | - | 5 | - | 1 | - | 12 | 11.7 |
| Redbreast sunfish | - | - | 1 | - | - | - | - | - | 1 | 1.0 |
| Pumpkinseed | - | - | 2 | 2 | 3 | 1 | 2 | - | 10 | 9.7 |
| White crappie | - | TAKEN | 1 | - | - | - | 1 | - | 2 | 1.9 |
| Black crappie | - | - | 2 | 1 | - | - | 4 | - | 7 | 6.8 |

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Table 4

Fishes taken by seine on 16 October 1979 near THINS.

| Station | TN-AQF-13B5 | TN-AQF-10B5 | TN-AQF-16A5 | TN-AQF-1A2 | TN-AQF-15A1 | TN-AQF-10A2 | TN-AQF-9B6 | TN-AQF-9A1 | TN-AQF-9B3 | TN-AQF-4A2 | Total | % Catch |
|-------------------------|-------------|---------------|-------------|---------------|-------------|-------------|------------|------------|------------|---------------|-------|---------|
| Time | 0836 | 1151 | 0900 | 0959 | 1020 | 1040 | 1056 | 1118 | 1132 | 0935 | | |
| Air Temp. (C) | 7.5 | 12.0 | 7.5 | 8.0 | 8.0 | 9.0 | 9.5 | 11.0 | 12.0 | 8.0 | | |
| Water Temp. (C) | 10.5 | 11.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.5 | 10.5 | 9.5 | | |
| Dissolved Oxygen (mg/l) | 11.9 | 11.1 | 11.2 | 10.8 | 10.8 | 10.9 | 10.9 | 10.8 | 10.8 | 10.8 | | |
| pH | 7.7 | 7.2 | 7.5 | 7.4 | 7.6 | 7.5 | 7.2 | 7.3 | 7.3 | 7.5 | | |
| Secchi Disc (cm) | 122 | 122 | 122 | 81 | 61 | 61 | 71 | 71 | 71 | 122 | | |
| River Stage (m) | 1.51 | 1.51 | 1.51 | 1.51 | 1.51 | 1.51 | 1.51 | 1.51 | 1.51 | 1.51 | | |
| Weather | Overcast | Partly Cloudy | Overcast | Partly Cloudy | Overcast | Overcast | Overcast | Overcast | Overcast | Partly Cloudy | | |
| No. of Specimens | 1772 | 355 | 31 | 126 | 151 | 49 | 166 | 11 | 485 | 220 | 3366 | |
| No. of Species | 11 | 10 | 10 | 9 | 12 | 10 | 8 | 5 | 8 | 8 | 20 | |
| No. of Bauls | 3 | 4 | 10 | 5 | 4 | 3 | 3 | 4 | 4 | 5 | 65 | |
| Golden shiner | - | 7 | - | - | 3 | - | - | - | - | - | 10 | 0.3 |
| Comely shiner | 2 | 5 | - | - | 2 | - | - | - | - | - | 20 | 0.6 |
| Common shiner | - | 1 | - | - | 1 | - | - | - | 11 | - | 2 | 0.1 |
| Spottail shiner | 2 | 4 | 2 | - | 43 | 15 | 19 | 2 | 1 | - | 88 | 2.6 |
| Swallowtail shiner | 2 | 4 | 1 | - | - | - | 2 | - | 1 | 7 | 17 | 0.5 |
| Rosyface shiner | - | 2 | - | - | - | - | 3 | - | - | - | 5 | 0.1 |
| Spotfin shiner | 1667 | 325 | 8 | 50 | 75 | 13 | 128 | 1 | 436 | 93 | 2796 | 83.1 |
| Nimble shiner | 36 | - | 1 | 1 | 4 | 2 | 4 | - | 11 | 1 | 60 | 1.8 |
| Bluntnose minnow | 38 | 1 | 1 | 49 | 14 | 4 | 4 | - | 3 | 27 | 137 | 4.1 |
| Fallfish | - | - | 1 | 2 | 2 | 4 | 1 | - | - | - | 10 | 0.3 |
| Quillback | - | - | - | - | 1 | - | - | - | - | - | 1 | + |
| White sucker | - | - | - | - | - | 1 | - | - | - | - | 1 | + |
| Rock bass | - | - | 1 | - | 1 | - | - | - | - | - | 2 | 0.1 |
| Redbreast sunfish | 1 | 1 | - | 1 | - | - | - | - | - | - | 3 | 0.1 |
| Pumpkinseed | 5 | - | - | 16 | 4 | 1 | - | - | - | - | 102 | 3.0 |
| Bluegill | 10 | 5 | - | 2 | - | - | - | 2 | 2 | 72 | 23 | 0.7 |
| Smallmouth bass | 2 | - | 1 | 1 | - | 2 | 1 | 1 | - | 6 | 8 | 0.2 |
| Tessellated darter | 7 | - | 6 | 4 | - | 6 | 8 | 5 | 20 | 13 | 69 | 2.0 |
| Banded darter | - | - | 9 | - | - | - | - | - | - | 1 | 11 | 0.3 |
| Wallace | - | - | - | - | 1 | 1 | - | - | - | - | 1 | + |
| | | | | | | | | | | | 1 | |

+ Less than 0.05%.

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Table 5

Fishes taken by seine on 24 October 1979 near IMINS.

| Station | TM-AQF-13B5 | TM-AQF-10B5 | TM-AQF-16A5 | TM-AQF-1A2 | TM-AQF-16A1 | TM-AQF-10A2 | TM-AQF-2B6 | TM-AQF-9A1 | TM-AQF-9B3 | TM-AQF-4A2 | Total | % Catch |
|-------------------------|-------------|---------------|-------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------|---------|
| Time | 1555 | 1231 | 1527 | 1510 | 1420 | 1355 | 1326 | 1311 | 1249 | 1453 | | |
| Air Temp. (C) | 10.0 | 12.5 | 10.5 | 10.5 | 12.5 | 12.0 | 12.5 | 11.5 | 11.0 | 12.0 | | |
| Water Temp. (C) | 15.5 | 15.5 | 15.0 | 15.0 | 15.0 | 14.5 | 15.0 | 15.0 | 15.5 | 15.0 | | |
| Dissolved Oxygen (mg/l) | 8.3 | 9.2 | 9.5 | 8.1 | 7.8 | 9.9 | 8.3 | 8.2 | 8.3 | 8.0 | | |
| pH | 7.7 | 8.1 | 7.7 | 7.5 | 7.5 | 7.6 | 7.5 | 7.7 | 7.6 | 7.5 | | |
| Secchi Disc (cm) | 61 | 61 | 91 | 61 | 53 | 41 | 46 | 46 | 46 | 61 | | |
| River Stage (m) | 1.28 | 1.28 | 1.28 | 1.28 | 1.28 | 1.28 | 1.28 | 1.28 | 1.28 | 1.28 | | |
| Weather | Overcast | Partly Cloudy | Overcast | Partly Cloudy | Partly Cloudy | Partly Cloudy | Partly Cloudy | Partly Cloudy | Partly Cloudy | Partly Cloudy | | |
| No. of Specimens | 42 | 19 | 110 | 147 | 36 | 502 | 162 | 7 | 18 | 33 | 1076 | |
| No. of Species | 7 | 1 | 9 | 2 | 6 | 8 | 2 | 3 | 2 | 7 | 15 | |
| No. of Hauls | 4 | 5 | 5 | 3 | 5 | 3 | 5 | 5 | 5 | 4 | 44 | |
| Stoneroller | - | - | 1 | - | - | - | - | - | - | - | 1 | 0.1 |
| Golden shiner | 1 | - | - | - | - | - | - | - | - | - | 1 | 0.1 |
| Comely shiner | - | - | - | 7 | - | 11 | - | - | - | - | 18 | 1.7 |
| Spottail shiner | 3 | - | 3 | - | - | 12 | 5 | - | - | - | 23 | 2.1 |
| Swallowtail shiner | 1 | - | 2 | - | - | - | - | - | - | - | 3 | 0.3 |
| Spotfin shiner | 33 | 19 | 96 | 140 | 26 | 454 | 157 | 5 | 12 | 3 | 945 | 87.8 |
| Minic shiner | - | - | 1 | - | 4 | 13 | - | - | - | - | 18 | 1.7 |
| Bluntnose minnow | 2 | - | 2 | - | 3 | 8 | - | - | - | 2 | 17 | 1.6 |
| Fallfish | - | - | 1 | - | - | - | - | - | - | - | 1 | 0.1 |
| Rock bass | - | - | - | - | - | - | - | - | - | 1 | 1 | 0.1 |
| Redbreast sunfish | - | - | - | - | - | - | - | - | - | 1 | 1 | 0.1 |
| Pumpkinseed | 1 | - | - | - | 1 | 1 | - | - | - | 22 | 25 | 2.3 |
| Bluegill | - | - | - | - | - | - | - | 1 | - | 3 | 4 | 0.4 |
| Smallmouth bass | - | - | 1 | - | 1 | 1 | - | - | - | - | 3 | 0.3 |
| Tessellated darter | 1 | - | 3 | - | 1 | 2 | - | 1 | 6 | 1 | 15 | 1.4 |

Table 6

Numbers of fishes impinged at the Unit 1 Intake during a 24-hr impingement survey on 24-25 October 1979.

| Date | 24 | 25 | 25 | | | | | | | |
|--|-------|-------|-------|------|-------|------|-------|------|-------|------|
| Time | 2000 | 0400 | 1200 | | | | | | | |
| Volumetric Flow Rate (m ³ /s) | 1.71 | 1.71 | 1.71 | | | | | | | |
| Number of River Water Pumps: | | | | | | | | | | |
| Nuclear Service | 2 | 2 | 2 | | | | | | | |
| Secondary Service | 1 | 1 | 1 | | | | | | | |
| Decay Heat | 1 | 1 | 1 | | | | | | | |
| Intake Velocity (cm/s) | -17 | -17 | -17 | | | | | | | |
| River Flow (m ³ /s) | 603.2 | 628.6 | 654.1 | | | | | | | |
| Air Temp. (C) | 9.5 | 10.0 | 13.0 | | | | | | | |
| Water Temp. (C) | 14.5 | 13.5 | 13.0 | | | | | | | |
| Condition of Fish | Alive | | Dead | | Alive | | Dead | | Total | |
| | Alive | Dead | Alive | Dead | Alive | Dead | Alive | Dead | Alive | Dead |
| Channel catfish | 1 | - | - | - | - | - | 1 | - | - | - |
| Pumpkinseed | 1 | - | - | - | - | - | 1 | - | - | - |
| Bluegill | - | - | - | 1 | - | - | - | 1 | - | 1 |
| Tessellated darter | 1 | - | - | 1 | - | 1 | 1 | 2 | - | 2 |
| Total | 3 | - | - | 2 | - | 1 | 3 | 3 | - | 3 |

Table 7

Summary of lengths, weights, breeding condition, and numbers of fishes impinged at the Unit 1 Intake on 24-25 October 1979.

| Species | Fork Length Range (5 mm groups) | Reproductive Status | Total Weight (g) | Total Number |
|--------------------|------------------------------------|---------------------|---------------------|--------------|
| Channel catfish | 61-65 | 1 Young | 2.8 | 1 |
| Pumpkinseed | 61-65 | 1 Juvenile | 3.7 | 1 |
| Bluegill | 45-50 | 1 Juvenile | 0.5 | 1 |
| Tessellated darter | 36-40, 46-50 | 1 Young, 2 Juvenile | 2.4 | 3 |
| Total | | | 9.4 | 6 |

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Table 8

Numbers of fishes impinged at the Unit 1 Intake during a 24-hr impingement survey on 30-31 October 1979.

| Date | 30 | 31 | 31 | | | | | | | |
|--|-------|-------|-------|---|-------|---|------|---|-------|---|
| Time | 2000 | 0400 | 1200 | | | | | | | |
| Volumetric Flow Rate (m ³ /s) | 1.33 | 1.33 | 1.33 | | | | | | | |
| Number of River Water Pumps: | | | | | | | | | | |
| Nuclear Service | 1 | 1 | 1 | | | | | | | |
| Secondary Service | 1 | 1 | 1 | | | | | | | |
| Decay Heat | 1 | 1 | 1 | | | | | | | |
| Intake Velocity (cm/s) | -18 | -18 | -18 | | | | | | | |
| River Flow (m ³ /s) | 589.0 | 580.5 | 573.4 | | | | | | | |
| Air Temp. (C) | 7.5 | 6.0 | 12.0 | | | | | | | |
| Water Temp. (C) | 10.5 | 9.0 | 11.5 | | | | | | | |
| Condition of Fish | Alive | | Dead | | Alive | | Dead | | Total | |
| Smallmouth bass | - | 1 | - | - | - | - | - | - | - | 1 |
| Tessellated darter | - | - | 1 | - | 1 | - | 2 | - | 2 | - |
| Total | - | 1 | 1 | - | 1 | - | 2 | - | 2 | 1 |

Table 9

Summary of lengths, weights, breeding condition, and numbers of fishes impinged at the Unit 1 Intake on 30-31 October 1979.

| Species | Fork Length Range (5 mm groups) | Reproductive Status | Total Weight (g) | Total Number |
|--------------------|------------------------------------|---------------------|---------------------|--------------|
| Smallmouth bass | 96-100 | 1 Young | 15.6 | 1 |
| Tessellated darter | 46-55 | 1 Juvenile, 1 Adult | 2.2 | 2 |
| Total | | | 17.8 | 3 |

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Table 10

Numbers of fishes impinged at the Unit 2 Intake during a 24-hr impingement survey on 17-18 October 1979.

| Date | 17 | 18 | 18 | | | | | | | |
|--|-------|-------|-------|------|-------|------|-------|------|-------|------|
| Time | 2000 | 0400 | 1200 | | | | | | | |
| Volumetric Flow Rate (m ³ /s) | 3.17 | 3.17 | 3.17 | | | | | | | |
| Number of River Water Pumps: | | | | | | | | | | |
| Nuclear Service | 2 | 2 | 2 | | | | | | | |
| Secondary Service | 2 | 2 | 2 | | | | | | | |
| Intake Velocity (cm/s) | -14 | -14 | -14 | | | | | | | |
| River Flow (m ³ /s) | 818.4 | 795.7 | 783.0 | | | | | | | |
| Air Temp. (C) | 14.0 | 13.0 | 17.5 | | | | | | | |
| Water Temp. (C) | 11.0 | 11.5 | 13.5 | | | | | | | |
| Condition of Fish | Alive | | Dead | | Alive | | Dead | | Total | |
| | Alive | Dead | Alive | Dead | Alive | Dead | Alive | Dead | Alive | Dead |
| Spottail shiner | - | 1 | - | - | 1 | - | 1 | - | 1 | 1 |
| Spotfin shiner | - | 4 | - | 1 | - | 1 | - | 1 | - | 6 |
| Channel catfish | 3 | 2 | - | 1 | 1 | - | 4 | - | 4 | 3 |
| Rock bass | - | - | - | - | 2 | - | 2 | - | 2 | - |
| Pumpkinseed | - | 2 | - | - | - | - | - | - | - | 2 |
| <u>Pomoxis</u> spp. | - | - | - | - | - | 1 | - | 1 | - | 1 |
| Tessellated darter | 1 | 6 | - | 4 | - | 2 | 1 | 2 | 1 | 12 |
| Total | 4 | 15 | - | 6 | 4 | 4 | 8 | 4 | 8 | 25 |

Table 11

Summary of lengths, weights, breeding condition, and numbers of fishes impinged at the Unit 2 Intake on 17-18 October 1979.

| Species | Fork Length Range (5 mm groups) | Reproductive Status | Total Weight (g) | Total Number |
|---------------------|------------------------------------|------------------------------|---------------------|--------------|
| Spottail shiner | 66-75 | 2 Adult | 7.5 | 2 |
| Spotfin shiner | 16-20, 26-35 | 6 Young | 1.8 | 6 |
| Channel catfish | 41-55, 66-70, 86-90 | 6 Young, 1 Juvenile | 18.2 | 7 |
| Rock bass | 36-40, 126-130 | 1 Young, 1 Juvenile | 39.0 | 2 |
| Pumpkinseed | 26-35 | 2 Young | 1.5 | 2 |
| <u>Pomoxis</u> spp. | 16-20 | 1 Young | 0.1 | 1 |
| Tessellated darter | 31-35 | 2 Young, 7 Juvenile, 4 Adult | 12.9 | 13 |
| Total | | | 81.0 | 33 |

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Table 12

Numbers of fishes impinged at the Unit 2 Intake during a 24-hr impingement survey on 22-23 October 1979.

| Date | 22 | 23 | 23 | | | | | | |
|--|-------|-------|-------|-------|-------|------|-------|------|--|
| Time | 2000 | 0400 | 1200 | | | | | | |
| Volumetric Flow Rate (m ³ /s) | 3.17 | 3.17 | 3.17 | | | | | | |
| Number of River Water Pumps: | | | | | | | | | |
| Nuclear Service | 2 | 2 | 2 | | | | | | |
| Secondary Service | 2 | 2 | 2 | | | | | | |
| Intake Velocity (cm/s) | -16 | -16 | -16 | | | | | | |
| River Flow (m ³ /s) | 594.7 | 580.5 | 574.8 | | | | | | |
| Air Temp. (C) | 22.0 | 17.0 | 24.0 | | | | | | |
| Water Temp. (C) | 17.5 | 18.0 | 17.0 | Total | | | | | |
| Condition of Fish | Alive | Dead | Alive | Dead | Alive | Dead | Alive | Dead | |
| Spotfin shiner | - | 2 | - | - | - | 1 | - | 3 | |
| Channel catfish | - | - | - | - | - | 1 | - | 1 | |
| Pumpkinseed | - | 1 | - | - | - | 2 | - | 3 | |
| Tessellated darter | - | - | - | 1 | - | - | - | 1 | |
| Total | - | 3 | - | 1 | - | 4 | - | 8 | |

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Table 13

Summary of lengths, weights, breeding condition, and numbers of fishes impinged at the Unit 2 Intake on 22-23 October 1979.

| Species | Fork Length Range (5 mm) | Reproductive Status | Total Weight (g) | Total Number |
|--------------------|-----------------------------|---------------------|---------------------|--------------|
| Spotfin shiner | 31-40 | 3 Young | 1.5 | 3 |
| Channel catfish | 146-150 | 1 Juvenile | 33.8 | 1 |
| Pumpkinseed | 31-35, 46-50 | 3 Young | 6.0 | 3 |
| Tessellated darter | 41-45 | 1 Juvenile | 0.6 | 1 |
| Total | | | 41.9 | 8 |

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Table 14

Numbers of fishes captured by AC electrofisher near TNINS in October 1979.

| Zone | 1582 | 1668 | 4A1 | 16A2 | 15A2 | 15A1 | 1181 | 1083 | 1081 | 13A1 | 10A3 | 9B5 |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Date | 2 Oct | 2 Oct | 2 Oct | 2 Oct | 2 Oct | 2 Oct | 3 Oct | 3 Oct | 3 Oct | 3 Oct | 3 Oct | 3 Oct |
| Time | 1945 | 2030 | 2122 | 2156 | 2230 | 2259 | 1923 | 1955 | 2042 | 2126 | 2153 | 2226 |
| Duration (min) | 20 | 18 | 18 | 15 | 14 | 15 | 15 | 20 | 17 | 18 | 16 | 15 |
| Air Temp. (C) | 18.0 | 19.0 | 18.5 | 18.5 | 18.5 | 18.5 | 16.0 | 18.5 | 17.5 | 17.0 | 15.5 | 16.0 |
| Water Temp. (C) | 18.0 | 18.5 | 18.0 | 18.0 | 18.5 | 18.5 | 18.0 | 18.5 | 18.5 | 16.5 | 16.5 | 16.5 |
| Dissolved Oxygen (mg/l) | 11.6 | 8.2 | 7.8 | 7.7 | 7.7 | 7.7 | 9.0 | 9.4 | 9.2 | 6.3 | 9.2 | 8.4 |
| pH | 7.5 | 7.7 | 7.4 | 7.3 | 7.4 | 7.5 | 7.8 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 |
| Conductivity (micromhos/cm) | 300 | 250 | 160 | 150 | 250 | 250 | 200 | 250 | 225 | 180 | 190 | 190 |
| Secchi Disc (cm) | 30 | 61 | 25 | 25 | 117 | 117 | 36 | 122 | 94 | 2 | 5 | 2 |
| Volts | 180 | 180 | 195 | 185 | 185 | 185 | 190 | 180 | 190 | 190 | 190 | 190 |
| Amps | 6.0 | 5.5 | 6.0 | 6.0 | 5.5 | 5.5 | 7.0 | 5.5 | 5.5 | 3.0 | 3.5 | 3.5 |
| Boo fin | - | - | - | - | - | - | - | - | - | - | - | - |
| American eel | - | - | - | - | - | - | - | - | - | - | - | - |
| Gizzard shad | 2 | 17 | 11 | 14 | 4 | 4 | 4 | 22 | 13 | - | - | - |
| Muskellunge | - | - | - | - | - | - | - | 1 | - | - | - | - |
| Carp | - | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 | 3 | - | 2 |
| Golden shiner | - | - | - | - | - | - | - | - | - | - | - | - |
| Fallfish | - | 1 | - | - | - | 4 | - | - | - | - | - | - |
| Quillback | 2 | 8 | 2 | 5 | 7 | 7 | 5 | 4 | 17 | - | 2 | 1 |
| White sucker | - | 7 | 1 | 8 | 1 | 2 | - | - | - | - | - | - |
| Northern hog sucker | - | - | - | - | 5 | 2 | - | - | - | - | - | - |
| Shorthead redhorse | - | 4 | - | - | 3 | 2 | - | - | - | - | - | - |
| Channel catfish | - | 1 | - | - | 1 | 1 | - | 1 | 3 | - | - | - |
| Rock bass | 6 | 32 | 2 | 1 | 3 | 12 | - | 11 | 3 | 2 | - | - |
| Redbreast sunfish | 5 | 4 | 1 | - | 5 | 5 | - | 7 | 7 | - | - | - |
| Pumpkinseed | 5 | 4 | 1 | - | 2 | 2 | 6 | 24 | 2 | - | - | 3 |
| Bluegill | - | - | 1 | - | - | - | 2 | 1 | 1 | - | - | - |
| Smallmouth bass | 7 | 19 | 3 | 9 | 3 | 3 | - | 14 | 2 | 8 | 2 | 1 |
| Largemouth bass | - | - | - | - | - | - | 1 | - | - | - | - | - |
| White crappie | 2 | - | - | - | - | - | - | - | - | - | - | - |
| Black crappie | 1 | 1 | - | - | - | 3 | - | 1 | - | - | - | - |
| Yellow perch | - | - | - | - | - | - | - | - | - | - | - | - |
| Walleye | 5 | 4 | - | 4 | 6 | 7 | 1 | 31 | 17 | - | - | - |
| No. of Specimens | 35 | 104 | 23 | 49 | 31 | 50 | 20 | 170 | 61 | 11 | 6 | 7 |
| No. of Species | 9 | 14 | 9 | 8 | 9 | 14 | 7 | 13 | 10 | 2 | 3 | 4 |

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Table 14 continued.

| Zone | 1582 | 1688 | 4A1 | 16A2 | 15A2 | 15A1 | 11B1 | 10B3 | 10B1 | 13A1 | 10A3 | 9B5 | Total |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| Date | 15 Oct | 15 Oct | 15 Oct | 15 Oct | 15 Oct | 15 Oct | 16 Oct | 16 Oct | 16 Oct | 16 Oct | 16 Oct | 16 Oct | |
| Time | 1925 | 2004 | 2045 | 2117 | 2153 | 2225 | 1902 | 1940 | 2010 | 2042 | 2117 | 2200 | |
| Duration (min) | 17 | 17 | 15 | 17 | 18 | 16 | 15 | 14 | 15 | 15 | 14 | 20 | |
| Air Temp. (C) | 8.5 | 7.5 | 7.5 | 8.0 | 8.0 | 7.0 | 12.0 | 12.0 | 13.5 | 12.0 | 12.0 | 12.0 | |
| Water Temp. (C) | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 10.5 | 11.0 | 11.0 | 11.0 | 10.5 | 11.0 | 10.5 | |
| Dissolved Oxygen (mg/l) | 13.3 | 10.2 | 9.0 | 10.0 | 10.4 | 10.1 | 14.8 | 11.1 | 11.0 | 10.8 | 10.8 | 10.2 | |
| pH | 8.0 | 8.8 | 8.3 | 8.3 | 8.2 | 8.2 | 7.8 | 8.0 | 8.0 | 7.8 | 7.7 | 7.6 | |
| Conductivity (microhm/cm) | 260 | 163 | 260 | 260 | 160 | 156 | 275 | 153 | 157 | 275 | 260 | 280 | |
| Secchi Disc (cm) | 132 | 89 | 66 | 46 | 94 | 112 | 56 | 117 | 96 | 48 | 41 | 48 | |
| Volts | 190 | 200 | 180 | 180 | 190 | 200 | 190 | 205 | 200 | 190 | 190 | 175 | |
| Amper | 5.0 | 4.0 | 5.5 | 5.5 | 3.5 | 2.5 | 5.0 | 3.0 | 3.0 | 5.5 | 5.5 | 5.0 | |
| Bozfin | - | - | - | - | - | 1 | - | - | - | - | 1 | - | 2 |
| American eel | - | 1 | - | - | - | - | - | - | - | - | - | - | 1 |
| Gizzard shad | - | - | 6 | 4 | - | - | - | - | - | 19 | 23 | 7 | 150 |
| Buckellunge | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| Carp | 1 | 8 | - | 2 | - | 2 | 2 | 1 | - | 3 | 3 | 4 | 45 |
| Golden shiner | - | - | - | - | - | - | 4 | - | - | - | - | - | 4 |
| Fatfish | - | - | - | 1 | 1 | 4 | - | - | - | - | - | - | 4 |
| Quillback | 11 | 4 | 2 | 4 | - | 4 | 9 | 2 | 13 | 3 | 7 | 4 | 11 |
| White sucker | - | 1 | - | 3 | - | - | - | - | - | 1 | 1 | - | 121 |
| Northern hog sucker | - | - | - | - | - | 5 | - | - | - | - | - | - | 27 |
| Shorthead redhorse | 1 | 1 | - | - | - | 1 | - | - | - | 1 | 1 | - | 31 |
| Channel catfish | - | - | - | 12 | 2 | 1 | - | - | - | - | - | - | 12 |
| Rock bass | 3 | 7 | 1 | 5 | 9 | 11 | - | - | - | 3 | 1 | 1 | 7 |
| Redbreast sunfish | 3 | 2 | 3 | 3 | 9 | 11 | - | 12 | - | 3 | 7 | 4 | 136 |
| Pumpkinseed | - | 2 | 3 | 3 | 10 | 5 | 4 | 1 | 5 | 3 | 7 | 4 | 63 |
| Bluegill | - | - | 11 | 2 | 2 | 2 | 38 | 2 | 3 | - | - | - | 107 |
| Smallmouth bass | 9 | 23 | 3 | 5 | 2 | 7 | 4 | 6 | 1 | 12 | 6 | 2 | 10 |
| Largemouth bass | - | - | 1 | - | - | - | - | - | - | - | - | - | 150 |
| White crappie | - | - | - | - | - | - | - | - | - | - | - | - | 7 |
| Black crappie | - | - | - | - | - | - | - | - | - | - | - | - | 3 |
| Yellow perch | 1 | 1 | 1 | 1 | 1 | 1 | 3 | - | - | - | - | - | 10 |
| Walleye | 5 | 1 | 2 | 13 | 6 | 1 | - | - | - | - | 2 | - | 8 |
| No. of Specimens | 14 | 49 | 30 | 52 | 32 | 6 | 11 | 20 | 10 | 15 | 18 | 9 | 178 |
| No. of Species | 8 | 10 | 9 | 11 | 7 | 13 | 11 | 6 | 32 | 58 | 70 | 31 | 104 |
| | | | | | | | | 7 | 5 | 8 | 11 | 7 | 27 |

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Table 15

Creel survey data from the GR for each survey day in October 1979.

| Day | 10 Wed | | | 14 Sun | | | 24 Wed | | | 27 Sat | | | | |
|---------------------------------------|-------------------------------------|------|------|---------------|-------|------|------------------------------------|-------|------|----------------------|-------|-------|-------|----|
| Weather | Heavy Rain, Overcast, Partly Cloudy | | | Partly Cloudy | | | Partly Cloudy, Windy Partly Cloudy | | | Partly Cloudy, Clear | | | | |
| River Stage (m) | 2.08 | | | 1.62 | | | 1.28 | | | 1.31 | | | | |
| Air Temperature (C) | 3.5 | 4.5 | 5.5 | 9.5 | 10.5 | 11.0 | 9.0 | 12.5 | 8.0 | 7.5 | 7.5 | 9.0 | | |
| Water Temperature (C) | 12.0 | 12.0 | 11.5 | 10.5 | 10.5 | 10.5 | 16.0 | 15.5 | 14.5 | 9.5 | 9.5 | 9.5 | | |
| Times: | | | | | | | | | | | | | | |
| a) morning (0900-1300) | a | | | a | | | a | | | a | | | | |
| b) afternoon (1300-1700) | | b | | | b | | | b | | | b | | | |
| c) evening (1700-2100) | | | c | | | c | | | c | | | c | | |
| Total Per Time Period: | | | | | | | | | | | | | TOTAL | |
| Anglers | - | 1 | - | 2 | 4 | 1 | 1 | 3 | 1 | 6 | 8 | 7 | 34 | |
| Fish Caught | - | - | - | 2 | 11 | 1 | 1 | 9 | - | 23 | 17 | 15 | 79 | |
| Fish Kept | - | - | - | - | - | 1 | - | 5 | - | 12 | 11 | 11 | 40 | |
| Hours Fished | - | 1.50 | - | 1.15 | 12.00 | 2.00 | 2.25 | 6.50 | 0.10 | 12.35 | 12.50 | 12.10 | 62.45 | |
| Catch/Effort (h) | - | - | - | 1.74 | 0.92 | 0.50 | 0.44 | 1.38 | - | 1.86 | 1.36 | 1.24 | 1.27 | |
| Day Totals: | | | | | | | | | | | | | | |
| Anglers | | 1 | | | 7 | | | 5 | | | 21 | | | |
| Fish Caught | | - | | | 14 | | | 10 | | | 55 | | | |
| Fish Kept | | - | | | 1 | | | 5 | | | 34 | | | |
| Hours Fished | | 1.50 | | | 15.15 | | | 8.85 | | | 36.95 | | | |
| Catch/Effort (h) | | - | | | 0.92 | | | 1.13 | | | 1.49 | | | |
| Species | a | b | c | a | b | c | a | b | c | a | b | c | Total | |
| Sunfishes (Lepomis spp.) ¹ | - | - | - | - | - | - | - | - | - | - | - | - | 3K | 3 |
| Southern bass | - | - | - | 2R | 11R | 1K | 1R | 5K 4R | - | 12K 10R 11K 6R | 8K 4R | 37K | 38R | 75 |
| Walleye | - | - | - | - | - | - | - | - | - | 1R | - | - | 1R | 1 |

¹ General identification.
 R Released.
 K Kept.

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Table 16

Creel survey data from the West Dam for each survey day in October 1979.

| Day | 10 Wed | | | 14 Sun | | | 24 Wed | | | 27 Sat | | | |
|--------------------------|--|------|------|---------------|------|------|---------------------------------------|------|------|-------------------------|-------|-----|-----------|
| Weather | Heavy Rain, Overcast, Partly Cloudy | | | Partly Cloudy | | | Partly Cloudy, Windy Partly Cloudy | | | Partly Cloudy, Clear | | | |
| River Stage (m) | 2.08 | | | 1.67 | | | 1.28 | | | 1.31 | | | |
| Air Temperature (C) | 3.0 | 4.5 | 5.5 | 9.5 | 10.5 | 11.0 | 7.5 | 10.0 | 8.5 | 7.5 | 7.5 | 9.0 | |
| Water Temperature (C) | 12.0 | 12.0 | 11.5 | 10.5 | 10.5 | 10.5 | 14.5 | 14.5 | 14.5 | 9.5 | 9.5 | 9.5 | |
| Times: | | | | | | | | | | | | | |
| a) morning (0900-1300) | a | | | a | | | a | | | a | | | |
| b) afternoon (1300-1700) | | b | | | b | | | b | | | b | | |
| c) evening (1700-2100) | | | c | | | c | | | c | | | c | TOTAL |
| Total Per Time Period: | | | | | | | | | | | | | |
| Anglers | - | - | - | 3 | - | - | - | - | - | 4 | 5 | - | 12 |
| Fish Caught | - | - | - | 7 | - | - | - | - | - | 6 | 19 | - | 32 |
| Fish Kept | - | - | - | - | - | - | - | - | - | 1 | 5 | - | 6 |
| Hours Fished | - | - | - | 1.50 | - | - | - | - | - | 4.00 | 10.75 | - | 16.25 |
| Catch/Effort (h) | - | - | - | 4.67 | - | - | - | - | - | 1.50 | 1.77 | - | 1.97 |
| Day Totals: | | | | | | | | | | | | | |
| Anglers | - | - | - | 3 | - | - | - | - | - | 9 | - | - | 9 |
| Fish Caught | - | - | - | 7 | - | - | - | - | - | 25 | - | - | 25 |
| Fish Kept | - | - | - | - | - | - | - | - | - | 6 | - | - | 6 |
| Hours Fished | - | - | - | 1.50 | - | - | - | - | - | 14.75 | - | - | 14.75 |
| Catch/Effort (h) | - | - | - | 4.67 | - | - | - | - | - | 1.69 | - | - | 1.69 |
| Species | a | b | c | a | b | c | a | b | c | a | b | c | Total |
| Channel catfish | - | - | - | 1R | - | - | - | - | - | - | 1K | - | 1K 1R 2 |
| Smallmouth bass | - | - | - | 1R | - | - | - | - | - | - | 2K 7R | - | 2K 8R 10 |
| Walleye | - | - | - | 5R | - | - | - | - | - | 1K 5R | 2K 7R | - | 3K 17R 20 |

R Released.
K Kept.

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Table 17

Creel survey data from the East Dam for each survey day in October 1979.

| Day | 10 Wed | | | 14 Sun | | | 24 Wed | | | 27 Sat | | | |
|--------------------------|-------------------------------------|------|------|---------------|------|-------|------------------------------------|------|------|----------------------|------|-------|-------|
| Weather | Heavy Rain, Overcast, Partly Cloudy | | | Partly Cloudy | | | Partly Cloudy, Windy Partly Cloudy | | | Partly Cloudy, Clear | | | |
| River Stage (m) | 2.08 | | | 1.62 | | | 1.28 | | | 1.31 | | | |
| Air Temperature (C) | 3.0 | 4.5 | 7.5 | 8.5 | 11.0 | 11.0 | 6.0 | 11.5 | 8.5 | 7.5 | 7.5 | 9.0 | |
| Water Temperature (C) | 12.0 | 11.5 | 11.5 | 9.5 | 10.5 | 10.5 | 14.5 | 15.0 | 15.0 | 9.5 | 10.0 | 9.5 | |
| Times: | | | | | | | | | | | | | |
| a) morning (0900-1300) | a | | | a | | | a | | | a | | | |
| b) afternoon (1300-1700) | b | | | b | | | b | | | b | | | |
| c) evening (1700-2100) | c | | | c | | | c | | | c | | | |
| Total Per Time Period: | | | | | | | | | | | | TOTAL | |
| Anglers | - | - | - | 4 | 5 | 5 | - | - | - | - | 4 | 7 | 20 |
| Fish Caught | - | - | - | 1 | 1 | 8 | - | - | - | - | 4 | 1 | 15 |
| Fish Kept | - | - | - | - | - | 1 | - | - | - | - | - | - | 1 |
| Hours Fished | - | - | - | 2.00 | 5.75 | 3.65 | - | - | - | - | 3.00 | 1.25 | 15.65 |
| Catch/Effort (h) | - | - | - | 0.50 | 0.17 | 2.19 | - | - | - | - | 1.33 | 0.80 | 0.96 |
| Day Totals: | | | | | | | | | | | | | |
| Anglers | - | | | 14 | | | - | | | 6 | | | |
| Fish Caught | - | | | 10 | | | - | | | 5 | | | |
| Fish Kept | - | | | 1 | | | - | | | - | | | |
| Hours Fished | - | | | 11.40 | | | - | | | 4.25 | | | |
| Catch/Effort (h) | - | | | 0.88 | | | - | | | 1.18 | | | |
| Species: | a | b | c | a | b | c | a | b | c | a | b | c | Total |
| Smallmouth bass | - | - | - | - | 1R | 3R | - | - | - | - | 1R | - | 5R |
| Largemouth bass | - | - | - | - | - | - | - | - | - | - | 1R | - | 1R |
| Walleye | - | - | - | 1R | - | 1K 4R | - | - | - | - | 2R | 1R | 1K 8R |

R Released.
K Kept.

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Table 18

Creel survey data from the YRGS for each survey day in October 1979.

| Day | 10 Wed | | | 14 Sun | | | 24 Wed | | | 27 Sat | | | |
|---------------------------------------|-----------------------|------|------|---------------|-------|------|----------------------|------|-------|---------------|-------|-------|--------|
| Weather | Snow, Overcast, Clear | | | Partly Cloudy | | | Partly Cloudy, Windy | | | Partly Cloudy | | | |
| River Stage (m) | 2.08 | | | 1.62 | | | 1.28 | | | 1.31 | | | |
| Air Temperature (C) | 3.0 | 6.0 | 7.0 | 10.5 | 14.0 | 11.0 | 9.0 | 11.5 | 9.5 | 8.0 | 9.0 | 8.5 | |
| Water Temperature (C) | 12.0 | 12.0 | 11.5 | 10.5 | 11.5 | 11.5 | 14.0 | 14.5 | 14.5 | 10.0 | 10.5 | 10.5 | |
| Times: | | | | | | | | | | | | | |
| a) morning (0900-1300) | a | | | a | | | a | | | a | | | |
| b) afternoon (1300-1700) | b | | | b | | | b | | | b | | | |
| c) evening (1700-2100) | c | | | c | | | c | | | c | | | TOTAL |
| Total Per Time Period: | | | | | | | | | | | | | |
| Anglers | - | 2 | 3 | 6 | 8 | 5 | 5 | - | 3 | 7 | 17 | 6 | 62 |
| Fish Caught | - | 1 | 8 | 24 | 7 | 4 | 16 | - | 14 | 3 | 11 | 5 | 93 |
| Fish Kept | - | - | - | 21 | 6 | 4 | 14 | - | 7 | 1 | 1 | 1 | 55 |
| Hours Fished | - | 0.65 | 3.10 | 22.50 | 17.50 | 5.50 | 6.15 | - | 2.25 | 3.50 | 23.65 | 10.00 | 94.80 |
| Catch/Effort (h) | - | 1.54 | 2.58 | 1.07 | 0.40 | 0.73 | 2.60 | - | 6.22 | 0.86 | 0.47 | 0.50 | 0.98 |
| Day Totals: | | | | | | | | | | | | | |
| Anglers | 5 | | | 19 | | | 8 | | | 30 | | | |
| Fish Caught | 9 | | | 35 | | | 30 | | | 19 | | | |
| Fish Kept | - | | | 31 | | | 21 | | | 3 | | | |
| Hours Fished | 3.75 | | | 45.50 | | | 8.40 | | | 37.15 | | | |
| Catch/Effort (h) | 2.40 | | | 0.77 | | | 3.57 | | | 0.51 | | | |
| Species | a | b | c | a | b | c | a | b | c | a | b | c | Total |
| White sucker | - | - | - | - | 1K | - | - | - | - | - | - | - | 1K |
| Channel catfish | - | - | - | 2K | 1K | - | 1K | - | - | - | - | - | 4K |
| Rock bass | - | - | - | 1K | - | - | - | - | - | - | - | - | 1K |
| Redbreast sunfish | - | - | - | 3K | - | - | - | - | - | - | - | - | 3K |
| Bluegill | - | - | - | - | - | - | - | - | 6K 2R | - | - | - | 6K 2R |
| Sunfishes (Lepomis spp.) ¹ | - | - | - | - | - | - | - | - | - | 2R | 2R | - | 4R |
| Smallmouth bass | - | - | - | 3K 2R | 1R | - | - | - | - | - | 1K 5R | - | 4K 8R |
| Largemouth bass | - | - | - | - | 1K | - | 1K | - | - | - | - | 1K | 3K |
| White crappie | - | - | - | - | - | - | 1K | - | - | 1K | - | - | 2K |
| Black crappie | - | - | - | 12K 1R | 3K | - | 11K | - | 1K | - | - | - | 27K 1R |
| Crappies (Pomoxis spp.) ¹ | - | - | - | - | - | - | - | - | - | - | 1R | - | 1R |
| Walleye | - | 1R | 8R | - | - | 4K | 2R | - | 5R | - | 2R | 4R | 4K 27R |

¹ General Identification.

R Released.

K Kept.

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POOR ORIGINAL

POOR ORIGINAL

Table 19

Summary of selected physicochemical parameters taken on 2 and 15 October 1979 near the THSS. Values are expressed in mg/l except for water temperature (C), pH, and turbidity (NTU).

| Location | Date | Water Temperature (C) | pH | Dissolved Oxygen | Turbidity (NTU) | Alkalinity as CaCO ₃ | Sulfate | Total Dissolved Solids | Total Copper | Dissolved Copper | Total Zinc | Dissolved Zinc |
|------------------------------|--------|-----------------------|-----|------------------|-----------------|---------------------------------|---------|------------------------|--------------|------------------|------------|----------------|
| TH-AQ1-1A1 | 2 Oct | 17.5 | 8.4 | 7.9 | 39.0 | 60 | 28 | 141 | 0.010 | 0.003 | 0.067 | 0.004 |
| TH-AQ1-1A2 | | 17.5 | 8.2 | 7.8 | 33.0 | 45 | 26 | 149 | 0.018 | 0.005 | 0.075 | 0.023 |
| TH-AQ1-11A1 | | 18.0 | 8.0 | 8.3 | 35.0 | 48 | 28 | 163 | 0.009 | 0.005 | 0.023 | 0.003 |
| TH-AQ1-11A2 | | 17.5 | 8.1 | 8.3 | 33.0 | 45 | 28 | 165 | 0.007 | 0.005 | 0.022 | 0.006 |
| TH-AQ1-9B1 | | 18.0 | 7.9 | 7.8 | 22.0 | 48 | 25 | 151 | 0.006 | 0.004 | 0.013 | 0.002 |
| TH-AQ1-1A1 | 15 Oct | 9.5 | 8.7 | 10.0 | 5.1 | 30 | 62 | 179 | 0.005 | 0.003 | 0.077 | 0.014 |
| TH-AQ1-1A2 | | 10.0 | 8.6 | 9.6 | 5.1 | 33 | 62 | 173 | 0.005 | 0.003 | 0.074 | 0.017 |
| TH-AQ1-11A1 | | 10.0 | 7.9 | 10.3 | 5.1 | 33 | 61 | 171 | 0.005 | 0.002 | 0.071 | 0.007 |
| TH-AQ1-11A2 | | 10.0 | 8.8 | 10.6 | 4.9 | 33 | 61 | 179 | 0.005 | 0.003 | 0.030 | 0.016 |
| TH-AQ1-9B1 | | 11.0 | 8.3 | 10.0 | 4.6 | 28 | 59 | 167 | 0.004 | 0.002 | 0.020 | 0.007 |
| NEAR VALUES FOR OCTOBER 1979 | | | | | | | | | | | | |
| TH-AQ1-1A1 | Oct | 13.5 | - | 9.0 | 22.0 | 35 | 65 | 160 | 0.004 | 0.003 | 0.017 | 0.008 |
| TH-AQ1-1A2 | | 13.8 | - | 8.7 | 19.0 | 39 | 45 | 161 | 0.012 | 0.004 | 0.075 | 0.020 |
| TH-AQ1-11A1 | | 16.0 | - | 9.3 | 20.0 | 40 | 46 | 157 | 0.007 | 0.003 | 0.073 | 0.005 |
| TH-AQ1-11A2 | | 13.8 | - | 9.4 | 19.0 | 39 | 64 | 167 | 0.006 | 0.004 | 0.026 | 0.011 |
| TH-AQ1-9B1 | | 16.5 | - | 8.9 | 13.3 | 38 | 42 | 159 | 0.005 | 0.003 | 0.016 | 0.005 |