MERRIMACK STATION FISHERIES SURVEY ANALYSIS OF 1967 THROUGH 2005 CATCH AND HABITAT DATA

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LIST OF ACRONYMS

1970's	=	Efish: 1972, 1973, 1974, 1976 Trapnet: 1974, 1975, 1976
2000's	=	2004, 2005
1995	=	Oct 94, Dec 94, Mar 95, May 95, Apr 95, Jun 95, Jul 95, Aug 95, Sep 95
ANCOVA	=	Analysis of Covariance
cfs	=	cubic feet per second
cm	=	centimeter(s)
cms	=	cubic meters per second
CPUE	=	Catch Per Unit Effort
EPA	=	U.S. Environmental Protection Agency
ft	=	foot, feet
h	=	hour(s)
LCL	=	Lower 95% Confidence Limit
m	=	meters
mgd	=	million gallons per day
min	=	minutes
mm	=	millimeter
MW	=	MegaWatts
N,n	=	Number of samples (sample size)
NH	=	New Hampshire
NHFG	=	New Hampshire Fish and Game Department
NS	=	Not Significant
PSM	=	Power Spray Modules
PSNH	=	Public Service of New Hampshire
SOP	=	Standard Operating Procedure Manual
tl	=	total length in mm
UCL	=	Upper 95% Confidence Limit

1.0 INTRODUCTION

Public Service Company of New Hampshire's (PSNH's) Merrimack Station in Bow, New Hampshire (the "Station") is seeking a renewal of its existing variance under Section 316(a) of the Clean Water Act (CWA), 33 U.S.C. §1326(a), as part of the renewal of its existing National Pollutant Discharge Elimination System (NPDES) permit (NPDES Permit NH0001465). At a 10 May 2002 meeting of the Merrimack Station Advisory Committee (which was established pursuant to Part I.15 of the Permit and comprises representatives of EPA, NHFG, NHDES, and USFWS), EPA indicated its intent to propose new thermal criteria that are more stringent than the §316(a) variance-based thermal criteria presently contained in the Station's existing Permit. This report, and the other reports prepared by Normandeau Associates, Inc. (Normandeau) and submitted to the Advisory Committee members herewith, collectively demonstrate that (1) the Station's past and current operations have resulted in no appreciable harm to the balanced indigenous populations of fish and other aquatic organisms in the segment of the Merrimack River receiving the Station's thermal discharge (the "BIP"), and (2) based on this lack of harm from past and current operations, and the reasonable expectation that the Station's operations will continue into the future at rates similar to those that prevailed in the past, there will be no future appreciable harm to the BIP.

Specifically, this report examines the time series of fisheries data collected from the Merrimack River in the vicinity of the Station over a forty-year period (in total, the "Merrimack River Fisheries Survey") for trends indicative of appreciable harm to the BIP due to the Station's thermal discharge. In addition, this report describes the extent of habitat influenced by the Station's thermal discharge compared to the thermal tolerance criteria for the nine species of fish found in Hooksett Pool and in upper Amoskeag Pool of the Merrimack River: the seven Representative Important Species ("RIS") selected and approved by the Advisory Committee in 1992, and two supplemental species recently suggested but not formally recommended or approved by the Advisory Committee as RIS.

The sampling activities comprising the Merrimack River Fisheries Survey were conducted from 1967 through 1978 and in 1995, 2004 and 2005 under the direction of the Advisory Committee or one or more of its members to characterize the river biota in the Hooksett Pool reach of the Merrimack River for the purpose of detecting potential long-term trends relating to the Station's operations. NHFG began the survey in Hooksett Pool in 1967 and repeated the sampling program in each year from 1967 through 1969 (Wightman 1971). Normandeau, on behalf of PSNH, and under the direction of the regulatory agencies, performed thermal and biological monitoring in Hooksett Pool from 1972 through 1978 (Normandeau 1973, 1974, 1975, 1976, 1977, 1979). The same thermal and biological monitoring program was repeated during 1995 (Normandeau 1996), and again during 2004 and 2005, to obtain additional annual observations of the abundance of RIS and the entire fish community of Hooksett Pool. These most recent fish abundance data provide current observations for comparison with historic abundance data from the previous series of surveys.

This report is organized in sections to address the following objectives. Section 2 provides a current assessment of the fish community in Hooksett Pool based on fisheries sampling efforts performed during 2004 and 2005. Section 3 presents the results of a fish population trend analysis based on the entire time series of comparable abundance trapnet and electrofish data collected through the Merrimack River Fisheries Survey between 1967 and 2005. Sections 4 and 5 present an assessment of the relationship between the Station's thermal discharge and nine species of fish that have been observed to be present in the Merrimack River in the vicinity of the Station.

2.0 Fisheries Survey Results for 2004 and 2005

2.1 Overview

Trapnet and electrofishing sampling were conducted in Hooksett Pool and in the Merrimack Station cooling canals during both 2004 and 2005. Figure 2-1 shows the locations of all trapnet and electrofishing Monitoring Stations.

2.2 Methods

2.2.1 Electrofishing Sampling

For the 2004 and 2005 sampling efforts, a total of 13 electrofishing Monitoring Stations were sampled within Hooksett Pool and in the Merrimack Station cooling canals (Table 2-1). During April through October and December 2004, electrofishing was conducted at ten Monitoring Stations within Hooksett Pool and at three Monitoring Stations in the cooling canals. However, during December 2004, electrofishing was not conducted at three of the ten Hooksett Pool Monitoring Stations due to ice cover (13E, 14E, 15E). Therefore, a total of 101 electrofishing samples were collected in 2004 (8 months times 13 Monitoring Stations minus 3 samples not taken in December) out of 104 scheduled samples. During each month April through September, and in November and December 2005, electrofishing was conducted at ten Monitoring Stations in Hooksett Pool and at three Monitoring Stations in the cooling canals. However, electrofishing could not be conducted as scheduled during October 2005 due to high flows and high water levels in Hooksett Pool, as described in Section 2.2.2 below for trapnetting. The electrofishing sampling from October was rescheduled during the next available lower flow period in November 2005. High flow conditions were not appropriate for effective electrofishing, because the high water levels would cause electrofishing sampling to occur in temporarily inundated terrestrial habitat along the shoreline that was not representative of the Hooksett Pool fish habitat occupied by the fish community. November electrofishing occurred at higher than preferred flows for this method of sampling during 2005. While data collected during November was included in the 2005 analysis, it was not considered ideal for use in our long term trends evaluation. During December 2005, electrofishing was not conducted at one of the ten Hooksett Pool Monitoring Stations due to ice cover. Therefore, a total of 103 electrofishing samples were collected in 2005 out of 104 scheduled samples (8 months times 13 Monitoring Stationss, minus 1 sample missing in December).

Electrofishing in Hooksett Pool was conducted during daylight hours (½ hour after sunrise to ½ hour before sunset). Electrofishing followed shoreline transects at each Monitoring Station in an upstream direction in water depths from 0 to 8 ft for a distance of 300 m, taking about 15-20 min to complete the transect at each Monitoring Station. Each of the three electrofishing transects sampled in the Merrimack Station cooling canals were 150-m long.

Each fish caught by electrofishing was counted, identified to species, weighed to the nearest gram, and measured to the nearest millimeter total length, and released back into the river. Water temperature and dissolved oxygen concentration were measured at 30 cm below the surface and 10 cm above the bottom at the midpoint of each 300m electrofishing transect after the completion of the electrofishing run. Additional details of the field and data collection methods for electrofishing are described in the SOP that was prepared before sampling began and governed all sampling activities during 2004 and 2005 (Normandeau 2004, 2005).

2.2.2 Trapnet Sampling

A total of six trapnets were fished during the same deployment period in each month at the same Monitoring Stations during the ice-free periods of 2004 and 2005. One trapnet was deployed at each of the following six Monitoring Stations (Table 2-2; Figure 2-1):

- Monitoring Station N10, located 6,500 ft upstream from the Station's thermal discharge on the east bank (1E),
- Monitoring Station N10, located 6,500 ft upstream from the Station's thermal discharge on the west bank (1W),
- Monitoring Station S2, located about 1,000 ft downstream from the Station's cooling canal discharge on the west bank of the River (2W),
- Monitoring Station S3, located about 1,500 ft downstream from the Station's cooling canal discharge on the east bank of the River (3E),
- New Discharge Canal located 210 ft upstream from the PSM's (4), and
- New Discharge Canal located 330 ft downstream from the PSM's (5).

Consecutive 48-h trapnet sets were fished at each of the six Monitoring Stations beginning on the following set dates in each of eight months during 2004: 19 April, 17 May, 21 June, 19 July, 23 August, 20 September, 11 October, and 6 December. Therefore, a total of 96 24-hour trapnet samples were collected in 2004 (eight months times six nets times two sets per month). The goal was to repeat the 2004 trapnet sampling design in 2005, however high River flows and the resulting high water elevations reduced the total effort in 2005 compared to 2004. High flow conditions were not appropriate for effective fishing of this gear, because the high water levels would cause the trapnets to be set in temporarily inundated terrestrial bank locations that were not representative of the Hooksett Pool fish habitat occupied by the fish community. High flows and the resulting high water levels in April 2005 (monthly mean River discharge at Goff's Falls was 19,120 cfs compared to an average April discharge of 14,100 cfs) limited trapnet sampling in that month to just the two "protected" Monitoring Stations in the New Discharge Canal. During October 2005, high River flows and high water levels (monthly mean discharge at Goff's Falls was 19,821 cfs compared to an average October discharge of 3,020 cfs) in Hooksett Pool prevented sampling at all six trapnet Monitoring Stations. Similar to electrofish sampling, the October 2005 trapnet effort was rescheduled to a lower flow period during November. However, River conditions during November were not such that trapnet gear would fish effectively and provide valid samples. During December 2005, trapnet sampling was not conducted due to a combination of high River flows in the early part of the month and ice cover during the latter part. During the remaining five months of 2005 (May through September), each of the six trapnet Monitoring Stations were sampled with two consecutive 48-h sets. The only exception occurred during July 2005, when the 48-h trapnet set at Monitoring Station S2W in lower Hooksett Pool was voided due to net-tampering, and was fished in the following week. Therefore, consecutive 48-h trapnet sets were fished at each of the six Monitoring Stations beginning on the following set dates in each of five months during 2005: 23 May, 20 June, 18 and 25 July, 15 August, 12 September and at the canal Monitoring Stations during April (25 April), resulting a total of 62 trapnet samples out of 96 possible samples collected in 2005 (five months times six nets times two sets per month, plus two April canal sets).

Trapnets fished among all six Monitoring Stations were constructed with 3-ft diameter hoops, a single 60 ft lead, and two 30-ft wings. The netting used was tarred ¾ inch stretch mesh knotted nylon made of #43 twine. Floats were spaced every three feet and were 2.5 inch discs floats. The leadlines were anchored with 1 inch weights spaced every two feet. The net lead was secured to the shore and then pulled outward into the River so that the lead was set across the flow and perpendicular to the shoreline. Wings were set with anchors and floats at an approximately 45 to 50 degree angle off of the main lead. The cod end of the trapnet was anchored in place and was retrievable by a float. After each 48-h set, trapnets were pulled and all fish were removed from the trap and placed in a tub of water in the boat. Each fish was then counted, identified to species, weighed to the nearest gram, measured to the nearest millimeter total length, and released. Water temperature and dissolved oxygen concentration were measured at 30 cm below the surface and 10 cm above the bottom of each trapnet Monitoring Station at the time the fish sample was removed from the net. Additional details of the field and data collection methods for trapnetting are described in the SOP that was prepared before sampling began and governed all sampling activities during 2004 and 2005 (Normandeau 2004, 2005).

2.2.3 Statistical Analysis

2.2.3.1 Habitat Stratification into Ambient and Thermally-influenced Zones

A post-hoc classification scheme was used to cluster the electrofishing data from each month and Monitoring Station into two strata or zones, Ambient and Thermally-influenced, based on the observed Merrimack River water temperature measured for each sample at the time of collection. The average water temperature (measured at the time of sampling) for Monitoring Stations 11 and 12 (combined) was calculated and used to represent the ambient thermal condition of Hooksett Pool without any potential thermal effects from Merrimack Station's discharge due to the upstream location of these two Monitoring Stations (Table 2-1, Figure 2-1). A value of 3.182 (t-value at $\alpha = 0.05$ for 3 degrees of freedom) times the standard error was used to represent the natural sampling variation for ambient water temperature for each monthly sampling event. The resulting mean ambient water temperature plus this measure of sampling variation provided the upper bound encompassing 95% of the ambient water temperature values and distinguished ambient from those water temperature measurements that were warmer than ambient. Any measured water temperature values warmer than this upper bound about the ambient water temperature that were observed among the remaining Monitoring Stations in each month were considered to be in the Thermally-influenced portion of Hooksett Pool. Using this empirical, post-hoc stratification scheme for each month of electrofishing sampling, Monitoring Stations were classified as Ambient or Thermally-influenced based upon their thermal conditions at the time of sampling (Table 2-3). For the purposes of this report, electrofishing Monitoring Stations that had water temperatures at the time of sampling that were within 95% of the mean are referred to as "Ambient" and those which did not are referred to as "Thermally-influenced".

This method of habitat stratification with respect to Merrimack Station's thermal influence is appropriate for application to the electrofishing samples because the sample and water temperature measurements were both in close temporal proximity (within 10-20 minutes), meaning that there is a reasonable likelihood that the fish present in the sample experienced the same temperature that was measured. However, this method was not applied to stratify the trapnet results. Trapnets are a passive gear that accumulate a catch of fish over each 48-hour deployment period during the 2004 and 2005 seasons. Thermal conditions at the trapnet Monitoring Stations likely varied over each 48-hour deployment period, particularly near the boundaries of the Ambient and Thermally-influenced strata, while the temperature measurements for the sample represent conditions observed only during a few minutes at the beginning or end of the 48-hour period. Without knowing when the fish were caught within the 48-hour deployment period, the catch could not be definitively associated with the water temperature measured at the time of net deployment or removal. Consequently, the 2004 and 2005 season trapnet analysis was conducted based solely on the geographic location of Monitoring Stations relative to the cooling canal discharge. As a result the trapnet data will be presented as "upper Hooksett Pool" and "lower Hooksett Pool" without post-hoc stratification to cluster these data into Ambient and Thermally-influenced locations. For these trapnet catch data, Upper Hooksett Pool is represented by Monitoring Station 1 (Sites 4 and 6, west and east bank, respectively), Lower Hooksett Pool is represented by Monitoring Station 2 and Monitoring Station 3, and the Merrimack Station cooling canal is represented by Monitoring Station 4 and Monitoring Station 5 (Table 2-2, Figure 2-1).

2.2.3.2 Catch Per Unit Effort Indices of Fish Species Abundance

Catch per unit effort (CPUE) was calculated for each fish species captured in each trapnet or electrofishing sample, and used to represent the abundance of fish sampled in the upstream Ambient and Thermally-influenced strata of Hooksett Pool. Theoretically, CPUE should be directly proportional to the abundance of fish in the stock, but sampling design characteristics such as gear, season, location, water temperature, water level, turbidity and river currents can influence this proportionality (Hubert, Chapter 6 in Nielsen and Johnson 1983; Guland 1988). Therefore, it is important to standardize these sampling design characteristics to insure that CPUE retains the same proportional relationship to fish stock abundance among years and is not influenced by changes in design.

Unit of effort for trapnets was defined as a single 48-h set. The actual duration of soaktime for each individual sample was calculated by recording the starting and ending times of the deployment to the nearest minute. Duration in decimal hours was calculated for each sample. Total catch by species was also determined on a per-sample basis. CPUE was then derived by merging the catch and effort data, by sample. CPUE was standardized to a 48-h set using the following equation:

$$\text{CPUE for taxon } j \text{ in sample } i = (\text{catch}_{ji} \,/\, \text{hours}_i) * 48$$

The CPUE for electrofishing sampling was standardized to a 300 m (1,000-ft) transect so that the catch could be compared among all Monitoring Stations. No adjustment was needed for the electrofishing transects in upper and lower Hooksett Pool because 300 m (1,000-ft) transects were sampled at each Monitoring Station. For electrofishing samples taken within the cooling canals, the effort was a 150 m (500-ft) transect of shocking at each Monitoring Station; therefore CPUE was standardized to a 300 m (1,000 ft) transect by doubling the total catch of a taxon within each sample.

Prior to calculating any mean CPUE values, whether by stratum or month or a combination thereof, the data were "zero filled" for each taxon, such that each taxon collected in the study is represented in every sample. Therefore, "replication" in this study is at the sample level. All zero catch samples (no fish of any species collected) are also included in this matrix.

2.3 2004 Field Season Results

2.3.1 Electrofishing General Catch Characteristics

Twenty-two fish species were captured by electrofishing during the eight months of sampling in Hooksett Pool (Stations 11, 12, 13, 14, and 15) and the new and old Merrimack Station cooling canals (Monitoirng Stations 16, 17, and 18) in 2004 (Table 2-4). Within Hooksett Pool (Monitoring Stations 11, 12, 13, 14 and 15) a total of 3,367 individuals, representing 21 species, were captured by electrofishing (Table 2-5). An additional 307 individuals, representing 12 species, were captured within the new and old Merrimack Station cooling canals. Spottail shiner were the most abundant species sampled by electrofishing in Hooksett Pool (Monitoring Stations 11, 12, 13, 14, and 15) during 2004, and were present in 29 out of the total of 77 samples collected, representing 62.1% of the total catch. Within Hooksett Pool, spottail shiner was followed in relative abundance by largemouth bass (9.6%), smallmouth bass (4.5%), bluegill (3.5%) and white sucker (3.2%). The remaining seventeen species each comprised 3% or less of the total electrofishing catch for 2004. Electrofishing within the Ambient zone of Hooksett Pool captured 19 species (2,634 individuals; Table 2-5) while electrofishing within the Thermally-influenced zone of Hooksett Pool captured a total of 19 species (733 individuals). Electrofishing at Monitoring Stations within the new and old cooling canals (Monitoring Stations 16, 17, 18) captured a total of 12 species (307 individuals; Table 2-5). Spottail shiner were the most abundant species in the 2004 electrofishing catch within both the Ambient zone of Hooksett Pool, being present within 21 samples of the 37 samples collected accounting for 70.5% of the total catch, and within the Thermally-influenced zone of Hooksett Pool, being present within 8 samples of the 40 samples collected, accounting for 31.7% of the total catch. Spottail shiner was not recorded in the electrofishing catch within the canals. Within the Ambient zone of Hooksett Pool spottail shiners were followed by largemouth bass (6.6%) and smallmouth bass (3.5%) in terms of relative abundance. The remaining 16 species each comprised 3% or less of the total 2004 electrofishing catch from the Ambient zone of Hooksett Pool. Within the Thermally-influenced zone of Hooksett Pool spottail shiners were followed in abundance by largemouth bass (20.5%), redbreast sunfish (10.6%), bluegill (8.7%), smallmouth bass (8.0%), white sucker (6.4%), and golden shiner (3.7%). The remaining species each comprised 3% or less of the total 2004 electrofishing catch from the Thermally-influenced zone of Hooksett Pool. Bluegill (33.6%), largemouth bass (28.7%), and smallmouth bass (11.4) were the most abundant species captured within the canals.

Five fish species not previously captured by electrofishing in Hooksett Pool during the 1970's and 1995 were recorded during the 2004 sampling season: alewife, Atlantic salmon, brown trout, Eastern silvery minnow and black crappie. The Atlantic salmon was a tagged hatchery-release fish captured within the existing cooling canal. Juvenile alewives were present in the fall months and were predominantly captured within the Ambient zone as they outmigrated from upriver areas. A table presenting total electrofishing catch and CPUE for 2004, sorted by month, Monitoring Station, site, date and species, can be found in Appendix A, Table 2.

2.3.2 Electrofishing Catch-Per-Unit-Effort

Table 2-6 presents a comparison of the annual total CPUE values calculated for each fish species and for all fish species combined captured by electrofishing throughout Hooksett Pool during the 2004 sampling season. The average catch per 1,000 ft transect (CPUE) was 43.8 fish for the combined Monitoring Stations fished throughout 2004 in Hooksett Pool (Monitoring Stations 11, 12, 13, 14, and

15 combined). Among the most abundant individual fish species caught during 2004, spottail shiner was the most abundant fish species caught with an annual total CPUE of 27.2, largemouth bass was the second most abundant fish species caught with an annual total CPUE of 4.2, smallmouth bass was the third most abundant fish species with an annual total CPUE of 2.0, and bluegill was the fourth most abundant fish species with an annual total CPUE of 1.6 fish per 1,000 foot transect for Monitoring Stations 11, 12, 13, 14, and 15 combined. The observed annual total electrofish CPUE for all fish species combined was 71.3 fish captured per 1,000 foot transect in the Ambient zone of Hooksett Pool, compared to 18.3 fish per 1,000 foot transect in the Thermally-influenced zone of Hooksett Pool, and 14.0 fish per 1,000 foot transect in the cooling canals. Comparing the annual total CPUE for the most abundant individual fish species caught by electrofishing in Ambient Hooksett Pool, spottail shiner was the most abundant fish species with a CPUE of 50.3, largemouth bass was the second most abundant fish species with a CPUE of 4.7, and smallmouth bass was the third most abundant fish species with a CPUE of 2.5 fish per 1,000 foot transect. Comparing the annual total CPUE for the most abundant individual fish species caught by electrofishing in Thermally-influenced Hooksett Pool, spottail shiner was the most abundant fish species with a CPUE of 5.8, largemouth bass was the second most abundant fish species with a CPUE of 3.8, and redbreast sunfish was the third most abundant fish species with a CPUE of 2.0 fish per 1,000 foot transect. Within the new and old Merrimack Station cooling canals, bluegill were the most abundant fish species caught with a CPUE of 4.7, followed by largemouth bass with a CPUE of 4.0 and smallmouth bass with a CPUE of 1.6 fish per 1,000 foot transect.

2.3.3 Trapnet General Catch Characteristics

Eighteen fish species were captured by trapnet during the eight months of sampling in Hooksett Pool (Monitoring Stations 1, 2 and 3) and the new Merrimack Station cooling canal (Monitoring Stations 4 and 5) in 2004 (Table 2-4). Within Hooksett Pool (Monitoring Stations 1, 2, and 3) a total of 18 species, represented by 493 individuals, were captured by trapnet (Table 2-7). An additional 149 individuals, representing eight species, were captured by trapnet within the cooling canal (Monitoring Stations 4 and 5; Table 2-7). Within Hooksett Pool (Monitoring Stations 1, 2 and 3), smallmouth bass were the most abundant species sampled by trapnets during 2004, and were present in 38 samples out of the total of 64 samples collected, representing 31.6% of the total catch. Smallmouth bass, combined with spottail shiner (26.8%), rock bass (11.2%) and bluegill (7.7%), represented greater than 75% of the total trapnet catch for 2004. Trapnets fished within the upper Hooksett Pool (Monitoring Station 1) captured 17 species and 266 individuals (Table 2-7). Trapnets fished within the lower Hooksett Pool (Monitoring Stations 2 and 3) captured 13 species and 227 individuals (Table 2-7). Trapnets fished in the cooling canal (Monitoring Stations 4 and 5) captured 8 species and 149 individuals; Table 2-7). Smallmouth bass were the most abundant species captured by trapnet in lower Hooksett Pool (41.9%) and the cooling canal (45.6%), and the second most abundant species captured by trapnet in upper Hooksett Pool (22.9%). Spottail shiners were the dominant species captured by trapnet in the upper Hooksett Pool, representing 37.6% of the total catch, and were present in 7 samples out of the total of 32 samples collected. Bluegill were the second most abundant species captured by trapnet within the lower Hooksett Pool (15.0%) and canal (20.8%). Rock bass represented approximately 11% of the total catch by trapnet within all three zones during 2004.

Three fish species were captured for the first time in trapnets fished in Hooksett Pool during 2004, representing an increase in species diversity over previous years. Spottail shiner, black crappie, and

Eastern silvery minnow were first collected by trapnet in 2004. Spottail shiner was previously captured by electrofishing but not by trapnet, while black crappie and Eastern silvery minnow were not collected previously by any sampling method in Hooksett Pool. In addition, bluegill and rock bass, first observed in large numbers during the 1995 study (Normandeau 1996), continued to be present and abundant in the fish community of Hooksett Pool during 2004. A table presenting total trapnet catch and CPUE for 2004, sorted by month, Monitoring Station, site, date and species, can be found in Appendix A, Table 1.

2.3.4 Trapnet Catch-Per-Unit-Effort

Table 2-8 presents a comparison of the annual total CPUE values calculated for each fish species and for all fish species combined captured by trapnets fished throughout Hooksett Pool during the 2004 sampling season. The average catch per 48 h of trapnet soak time (CPUE) was 7.0 fish for the combined Monitoring Stations fished throughout 2004 in Hooksett Pool (Monitoring Stations 1, 2, and 3 combined). Among the most abundant individual fish species caught during 2004, smallmouth bass was the most abundant fish species caught with an annual total CPUE of 2.5, spottail shiner was the second most abundant fish species caught with an annual total CPUE of 2.1, rock bass was the third most abundant fish species with an annual total CPUE of 0.9, and bluegill was the fourth most abundant fish species with an annual total CPUE of 0.6 fish per 48-h trapnet set for Monitoring Stations 1, 2, and 3 combined. The observed annual total trapnet CPUE for all fish species combined was 8.4 fish captured per 48-h trapnet set in upper Hooksett Pool, compared to 7.1 fish per 48 h in lower Hooksett Pool, and 5.3 fish per 48 h in the cooling canal. Comparing the annual total CPUE for the most abundant individual fish species caught by trapnet in upper Hooksett Pool (Monitoring Station 1), spottail shiner was the most abundant fish species with a CPUE of 3.2, smallmouth bass was the second most abundant fish species with a CPUE of 1.9, and rock bass was the third most abundant fish species with a CPUE of 1.0 fish per 48 h trapnet set. Comparing the annual total CPUE for the most abundant individual fish species caught by trapnet in lower Hooksett Pool (Monitoring Stations 2 and 3), smallmouth bass was the most abundant fish species with a CPUE of 3.0, bluegill was the second most abundant fish species with a CPUE of 1.0, and spottail shiner was the third most abundant fish species with a CPUE of 1.0 fish per 48 h trapnet set. Within the Merrimack Station cooling canal, smallmouth bass was the most abundant fish species caught with a CPUE of 2.4, followed by bluegill with a CPUE of 1.1 and rock bass with a CPUE of 0.6 fish per 48 h trapnet set.

2.4 2005 Field Season Results

2.4.1 Electrofishing General Catch Characteristics

Twenty-one fish species were captured by electrofishing during the eight months of sampling in Hooksett Pool (Monitoring Stations 11, 12, 13, 14 and 15) and the new and old Merrimack Station cooling canals (Monitoring Stations 16, 17, and 18) in 2005 (Table 2-4). Within Hooksett Pool (Monitoring Stations 11, 12, 13, 14 and 15) a total of 1,032 individuals representing 18 species, were captured by electrofishing (Table 2-9). An additional 186 individuals representing 16 species, were captured within the new and old Merrimack Station cooling canals by electrofishing during 2005. Similar to 2004, spottail shiner (17.2%) were the most abundant species captured by electrofishing throughout Hooksett Pool. Spottail shiner was present in 23 out of the 79 electrofish samples collected within Hooksett Pool during 2005. However, their percentage of the total Hooksett Pool (Monitoring Stations 11, 12, 13, 14 and 15) catch was much less than 2004, when they represented

62.1% of the total electrofishing catch. Within Hooksett Pool (Monitoring Stations 11, 12, 13, 14 and 15) fallfish were the second ranked species (14.9%), largemouth bass were the third ranked species (13.3%), and bluegill were the fourth ranked species (12.8%). Electrofishing within the Ambient zone of Hooksett Pool captured 18 species (594 individuals) while electrofishing within the Thermally-influenced zone of Hooksett Pool captured a total of 16 species (438 individuals; Table 2-9). Fallfish were the dominant species within the Ambient zone of Hooksett Pool accounting for 25.4% of the total catch, followed by spottail shiner (15.8%), largemouth bass (13.1%) and white sucker (12.0%). Within the Thermally-influenced zone of Hooksett Pool, bluegill (19.6%) were the dominant species, followed by spottail shiner (19.2%), largemouth bass (13.5%), and redbreast sunfish (12.1%). Relative abundance within the Merrimack Station cooling canals was dominated by yellow perch (23.7), bluegill (23.1%), and largemouth bass (18.8%).

The common carp, a species previously unreported from Normandeau electrofishing catches during the 1970's, 1995, and 2004, was observed for the first time in Hooksett Pool during 2005. Common carp and white perch were the only two species captured by electrofishing in 2005 that were not observed in 2004. Three species that had been captured by electrofishing during 2004 – alewife, brown bullhead, and common shiner – were not observed during 2005. This difference in species richness between 2004 and 2005 reflects the need for sampling design consistency among years when making cross-year comparisons (Hubert, Chapter 6 in Nielsen and Johnson 1983; Guland 1988), because river conditions limited electrofishing sampling to a different set of eight months in 2005 (Apr-Sept, Nov, Dec) compared to eight months of electrofish sampling in 2004 (Apr-Oct, Dec.). A table presenting total electrofishing catch and CPUE for 2005, sorted by month, Monitoring Station, site, date and species, can be found in Appendix A, Table 4.

2.4.2 Electrofishing Catch-Per-Unit-Effort

Table 2-10 presents a comparison of the annual total CPUE values calculated for each fish species and for all fish species combined captured by electrofishing throughout Hooksett Pool during the 2005 sampling season. The average catch per 1,000 ft transect (CPUE) was 13.1 fish for the combined Monitoring Stations fished throughout 2005 in Hooksett Pool (Monitoring Stations 11, 12, 13, 14, and 15 combined). Among the most abundant individual fish species caught during 2005, spottail shiner was the most abundant fish species caught with an annual total CPUE of 2.3, fallfish was the second most abundant fish species caught with an annual total CPUE of 2.0, largemouth bass and bluegill were the third most abundant fish species with an annual total CPUE of 1.7 fish per 1,000 foot transect for Monitoring Stations 11, 12, 13, 14, and 15 combined. The observed annual total electrofish CPUE for all fish species combined was 13.2 fish captured per 1,000 foot transect in the Ambient zone of Hooksett Pool, compared to 12.9 fish per 1,000 foot transect in the Thermally-influenced zone of Hooksett Pool, and 7.8 fish per 1,000 foot transect in the cooling canals. Comparing the annual total CPUE for the most abundant individual fish species caught by electrofishing in Ambient Hooksett Pool, fallfish was the most abundant fish species with a CPUE of 3.4, spottail shiner was the second most abundant fish species with a CPUE of 2.1, and largemouth bass was the third most abundant fish species with a CPUE of 1.7 fish per 1,000 foot transect. Comparing the annual total CPUE for the most abundant individual fish species caught by electrofishing in Thermally-influenced Hooksett Pool, bluegill and spottail shiner were the most abundant fish species with a CPUE of 2.5 and largemouth bass was the second most abundant fish species with a CPUE of 1.7 fish per 1,000 foot transect. Within the new and old Merrimack Station cooling canals, bluegill were the most abundant fish species caught with a CPUE of 1.8, followed by largemouth bass with a CPUE of 1.5 and smallmouth bass with a CPUE of 0.6 fish per 1,000 foot transect.

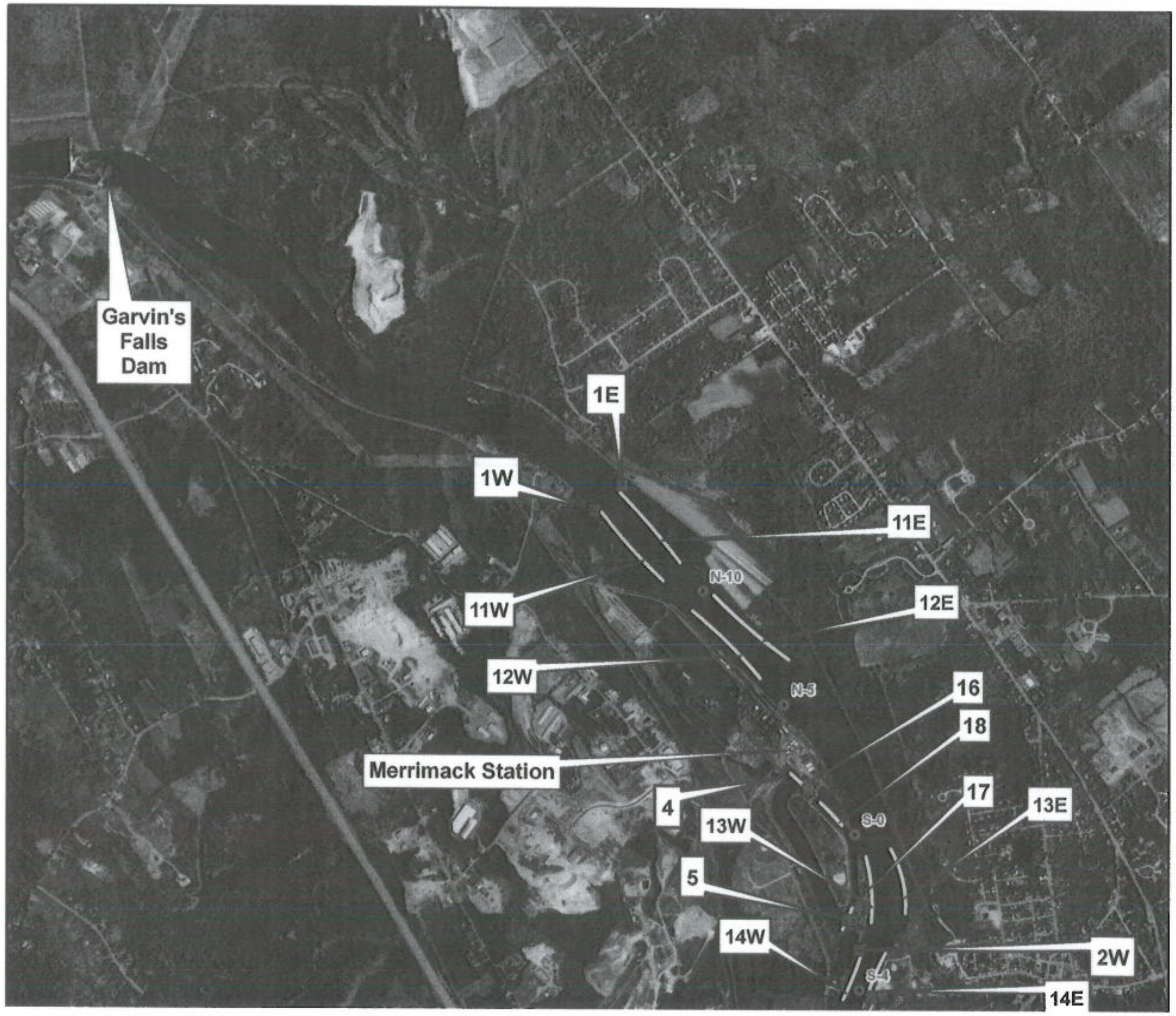
2.4.3 Trapnet General Catch Characteristics

Thirteen fish species were captured by trapnet during the five months of sampling in Hooksett Pool (Monitoring Stations 1, 2, and 3) and the new Merrimack Stations cooling canal (Monitoring Stations 4 and 5) in 2005 (Table 2-4). Within Hooksett Pool (Monitoring Stations 1, 2, and 3) 136 individuals, representing 11 species, were captured by trapnet (Table 2-11). An additional 69 individuals were captured within the Merrimack Station cooling canal (Monitoring Stations 4 and 5), representing eight species. Within Hooksett Pool (Monitoring Stations 1, 2, and 3), smallmouth bass were the most abundant species sampled by trapnets during 2005, and were present in 18 out of the total of 41 samples collected, representing 54.4% of the total catch. Smallmouth bass captured by trapnet in Hooksett Pool (Monitoring Stations 1, 2, and 3) were followed by redbreast sunfish (16.9%), bluegill (9.6%), and rock bass (8.1%). The other seven species captured by trapnet in Hooksett Pool during 2005 each comprised 3% or less of the total catch. Trapnets fished within upper Hooksett Pool (Monitoring Station 1) captured eight species (39 individuals) while trapnets fished within lower Hooksett Pool (Monitoring Stations 2 and 3) captured seven species (97 individuals; Table 2-11). Smallmouth bass were the most abundant species captured among all three strata (upper Hooksett Pool, lower Hooksett Pool, cooling canal) sampled by trapnet. Smallmouth bass were present in 7 out of the total of 20 samples collected representing 43.6% of upper Hooksett Pool catch, were present in 11 out of the total of 21 samples collected representing 58.8% of lower Hooksett Pool catch and were present in 13 out of the total of 22 samples collected representing 69.6% of the canal catch. During 2005, rock bass (15.4%) and white sucker (10.3%) were the second and third most abundant species captured by trapnet in upper Hooksett Pool, redbreast sunfish (20.6%) and bluegill (10.3%) were the second and third most abundant species captured by trapnet in lower Hooksett Pool, and bluegill (11.6%) and black crappie (10.1%) were the second and third most abundant species captured by trapnet in the Merrimack Station cooling canal.

There were no previously unrecorded species captured by trapnet during 2005. Tessellated darter and white perch were the only two species captured by trapnet in 2005 that were not observed in 2004, but these two species were captured in the 1970's and 1995. Seven species that had been captured by trapnet during 2004 – American eel, brown bullhead, chain pickerel, fallfish, golden shiner, largemouth bass, and yellow bullhead – were not observed during 2005. This difference in species richness between 2004 and 2005 reflects the need for sampling design consistency among years when making cross-year comparisons (Hubert, Chapter 6 in Nielsen and Johnson 1983; Guland 1988), because river conditions limited Hooksett Pool (Monitoring Stations 1, 2 and 3) trapnet sampling to five months in 2005 (May-September) compared to eight months of trapnet sampling in 2004 (April – December). A table presenting total trapnet catch and CPUE for 2005, sorted by month, Monitoring Station, site, date and species, can be found in Appendix A, Table 3.

2.4.4 Trapnet Catch-Per-Unit-Effort

Table 2-12 presents a comparison of the annual total CPUE values calculated for each fish species and for all fish species combined captured by trapnets fished throughout Hooksett Pool during the 2005 sampling season. The average catch per 48 h of trapnet soak time (CPUE) was 3.3 fish for the combined Monitoring Stations fished throughout 2005 in Hooksett Pool (Monitoring Stations 1, 2, and 3 combined). Among the most abundant individual fish species caught during 2005, smallmouth bass was the most abundant fish species caught with an annual total CPUE of 1.8, redbreast sunfish was the second most abundant fish species caught with an annual total CPUE of 0.6, bluegill was the third most abundant fish species with an annual total CPUE of 0.3, and rock bass was the fourth most abundant fish species with an annual total CPUE of 0.3 fish per 48-h trapnet set for Monitoring Stations 1, 2, and 3 combined. The observed annual total trapnet CPUE for all fish species combined was 2.0 fish captured per 48-h trapnet set in upper Hooksett Pool, compared to 4.7 fish per 48 h in lower Hooksett Pool, and 3.2 fish per 48 h in the cooling canal. Comparing the annual total CPUE for the most abundant individual fish species caught by trapnet in upper Hooksett Pool (Monitoring Station 1), smallmouth bass was the most abundant fish species with a CPUE of 0.9, rock bass was the second most abundant fish species with a CPUE of 0.3, and white sucker was the third most abundant fish species with a CPUE of 0.2 fish per 48 h trapnet set. Comparing the annual total CPUE for the most abundant individual fish species caught by trapnet in lower Hooksett Pool (Monitoring Stations 2 and 3), smallmouth bass was the most abundant fish species with a CPUE of 2.8, redbreast sunfish was the second most abundant fish species with a CPUE of 1.0, and bluegill was the third most abundant fish species with a CPUE of 0.5 fish per 48 h trapnet set. Within the Merrimack Station cooling canal, smallmouth bass was the most abundant fish species caught with a CPUE of 2.2, followed by bluegill with a CPUE of 0.4 and black crappie with a CPUE of 0.3 fish per 48 h trapnet set.


Garvin's Falls Dam
1E
1W
11E
N-10
11W
12E
12W
N-5
16
18
Merrimack Station
4
17
13E
S-0
13W
5
14W
2W
S-4
14E

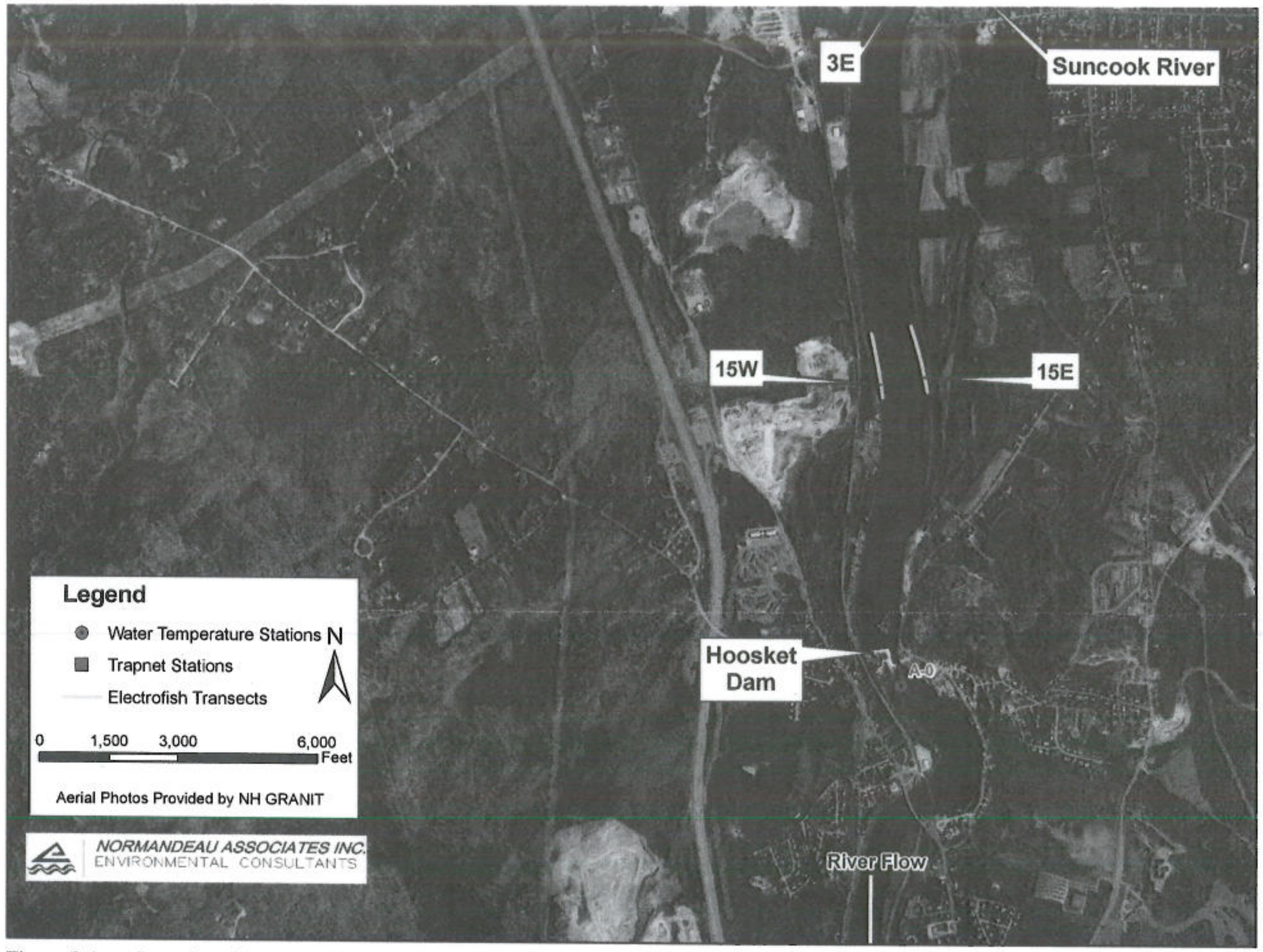


Figure 2-1. Location of trapnet and electrofish Monitoring Stations, Merrimack River Monitoring Program, Hooksett Pool, New Hampshire 2004 to 2005.

Table 2-1. Monitoring Station locations and descriptions for the 2004 and 2005 Merrimack River Electrofishing Fisheries Survey. Northing and easting in NH State Plane NAD83 ft.

Monitoring Station	Site	Description from Historical Data	US Northing	US Easting	DS Northing	DS Easting
11	4	N9-N10 West	1034463.66516	237205.77506	1035416.01098	236149.53697
11	6	N9-N10 East	1034740.71121	237517.45188	1035675.74166	236426.58303
12	4	N6-N7 West	1035866.21082	235682.02175	1036905.13354	234643.09904
12	6	N6-N7 East	1036195.20301	235924.43705	1037338.01800	234937.46047
13	4	S0-S1 West	1038537.41717	231889.74771	1038624.50940	230864.73914
13	6	S0-S1 East	1038919.28311	232010.33695	1039147.06279	231005.42659
14	4	S4-S5 West	1038189.04824	229665.54610	1038510.61956	230516.37021
14	6	S4-S5 East	1038885.78610	230462.77499	1038517.31896	229538.25746
15	4	S17-S18 West	1037699.99187	223877.57235	1037860.77752	222959.75422
15	6	S17-S18 East	1038262.74167	223991.46219	1038497.22075	223046.84645
16		Cooling Canal - upstream of PSM's	1038329.73569	231105.91762	1038175.64944	230757.54870
17		Cooling Canal - downstream of PSM's	1037371.72115	233176.03297	1037699.99187	232874.55986
18		Old Canal	1037827.28051	232727.17301	1038162.25063	232378.80409

Table 2-2. Monitoring Station locations and descriptions for the 2004 and 2005 Merrimack River Trapnet Fisheries Survey. Northing and easting in NH State Plane NAD83 ft.

Monitoring Station	Site	Description from Historical Data	Northing	Easting
1	4	N10 West	1034349.57002565	237233.19571349
1	6	N10 East	1034771.76946771	237622.91827540
2	4	S2 West	1038629.55887514	229689.32663999
3	6	S3 East	1038427.73826272	230433.97510649
4		New Canal - upstream of PSM's	1037646.70526831	232921.62950676
5		New Canal - downstream of PSM's	1038246.79564470	230900.20408254

Table 2-3. **Results of post-hoc stratification to classify Merrimack River electrofishing samples from 2004 and 2005 into Ambient or Thermally-influenced conditions at time of sampling. Shading denotes dates and Monitoring Stations that represent ambient conditions in upper Hooksett Pool, and unshaded cells represent dates and Monitoring Stations within the Thermally-influenced zone of Lower Hooksett Pool. Water temperature values are presented in °C.**

Month	Year	11E	11W	12E	12W	13E	13W	14E	14W	15E	15W
April	2004	12.2	12.8	13	12.7	12.7	21.4	14.7	15.1	14.2	14.2
May	2004	12.5	12.5	12.7	12.8	13.4	14.5	13.5	13.4	13.6	14.1
June	2004	21	21.3	21.5	21.3	29.2	20.8	28.3	26.6	25.5	25.9
July	2004	24	24.1	24.5	24.1	30.5	26.8	27.5	25.7	25.2	26
August	2004	24.3	24.3	24.5	24.6	31.6	30.1	25.8	30.7	27.3	26
September	2004	18.1	18.2	18.3	18.1	23.8	19.1	20.1	18.7	18	18.5
October	2004	12.5	12.5	12.8	12.6	17.2	19.5	17.2	15.5	11	12.5
December	2004	0.4	0.2	0.3	0.1	ICE	5.4	ICE	5.4	ICE	2.9
April	2005	10.1	9.7	10	10.1	11.3	16.1	11.3	13.7	12.4	13.4
May	2005	13.2	13.1	13.4	13	12.6	14.2	12.6	13.9	13.3	13.6
June	2005	23.8	23.9	22.6	23	23.3	26.7	23.2	27.7	23.2	23.2
July	2005	24.9	24.9	25.1	24.6	31.3	33.7	28.8	29.5	28.8	30.6
August	2005	24.6	24.5	23.9	24.4	32.3	30.5	29.5	29.8	27	27.4
September	2005	18.5	18.5	19.1	18.7	27.5	23.7	23.9	21.8	22	22.7
November	2005	5.3	5.3	5.3	5.4	5.2	8.5	5.1	5	5	5.6
December	2005	1.5	1.7	1.5	1.7	0.9	10.1	0.9	6.3	ICE	2.5

Table 2-4. Common and scientific names of fish species collected in the 2004 and 2005 Merrimack Station Fisheries Studies.

Common Name	Scientific Name	2004 E-fish	2004 Trapnet	2005 E-fish	2005 Trapnet
Alewife	*Alosa pseudoharengus*	X			
American eel	*Anguilla rostrata*	X	X	X	
Atlantic salmon	*Salmo salar*	X		X	
Black crappie	*Pomoxis nigromaculatus*	X	X	X	X
Bluegill	*Lepomis macrochirus*	X	X	X	X
Brown bullhead	*Ameiurus nebulosus*	X	X		
Brown trout	*Salmo trutta*	X		X	
Chain pickerel	*Esox niger*	X	X	X	
Common carp	*Cyprinus carpio*			X	
Common shiner	*Luxilus cornutus*	X			
Eastern silvery minnow	*Hybognathus regius*	X	X	X	X
Fallfish	*Semotilus corporalis*	X	X	X	
Golden shiner	*Notemigonus crysoleucas*	X	X	X	
Largemouth bass	*Micropterus salmoides*	X	X	X	
Margined madtom	*Noturus insignis*	X	X	X	X
Pumpkinseed	*Lepomis gibbosus*	X	X	X	X
Redbreast sunfish	*Lepomis auritus*	X	X	X	X
Rock bass	*Ambloplites rupestris*	X	X	X	X
Smallmouth bass	*Micropterus dolomieu*	X	X	X	X
Spottail shiner	*Notropis hudsonius*	X	X	X	X
Tessellated darter	*Etheostoma olmstedi*	X		X	X
White perch	*Morone americana*			X	X
White sucker	*Catostomus commersonii*	X	X	X	X
Yellow Bullhead	*Ameiurus natalis*		X		
Yellow perch	*Perca flavescens*	X	X	X	X
Total Species		**22**	**18**	**21**	**13**

Table 2-5. Total catch (N) and relative abundance (%) of fishes caught by electrofishing within the Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling), Hooksett Pool (Monitoring Stations 11-15), and the new and old Merrimack Station cooling canals (Monitoring Stations 16-18) during 2004.

	Zone							
	Ambient		Thermally-influenced		Hooksett Pool		Canals	
Common Name	N	%	N	%	N	%	N	%
Alewife	76	2.9	5	0.7	81	2.4	0	0.0
American Eel	13	0.5	7	1.0	20	0.6	3	1.0
Atlantic Salmon	0	0.0	0	0.0	0	0.0	1	0.3
Black Crappie	1	0.0	4	0.5	5	0.1	8	2.6
Bluegill	55	2.1	64	8.7	119	3.5	103	33.6
Brown Bullhead	0	0.0	1	0.1	1	0.0	0	0.0
Brown Trout	0	0.0	1	0.1	1	0.0	0	0.0
Chain Pickerel	7	0.3	2	0.3	9	0.3	2	0.7
Common Shiner	65	2.5	0	0.0	65	1.9	0	0.0
Eastern Silvery Minnow	14	0.5	0	0.0	14	0.4	0	0.0
Fallfish	59	2.2	21	2.9	80	2.4	0	0.0
Golden Shiner	40	1.5	27	3.7	67	2.0	0	0.0
Largemouth Bass	174	6.6	150	20.5	324	9.6	88	28.7
Margined Madtom	1	0.0	2	0.3	3	0.1	0	0.0
Pumpkinseed	8	0.3	15	2.0	23	0.7	32	10.4
Redbreast Sunfish	28	1.1	78	10.6	106	3.1	9	2.9
Rock Bass	7	0.3	1	0.1	8	0.2	8	2.6
Smallmouth Bass	92	3.5	59	8.0	151	4.5	35	11.4
Spottail Shiner	1860	70.5	232	31.7	2092	62.1	0	0.0
Tessellated Darter	7	0.3	7	1.0	14	0.4	0	0.0
White Sucker	61	2.3	47	6.4	108	3.2	11	3.6
Yellow Perch	66	2.5	10	1.4	76	2.3	7	2.3
Total	**2634**	**99.9**	**733**	**100.0**	**3367**	**99.9**	**307**	**100.0**

Table 2-6. Mean CPUE (fish per 1,000 ft transect) and 95% confidence limits of fishes caught by electrofishing within the Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling), Hooksett Pool (Monitoring Stations 11-15), and the new and old Merrimack Station cooling canals (Monitoring Stations 16-18) during 2004.

	Zone											
	Ambient (N=37)			Thermally-influenced (N=40)			Hooksett Pool (N=77)			Canals (N=22)		
Common Name	95% LCL	CPUE	95% UCL	95% LCL	CPUE	95% UCL	95% LCL	CPUE	95% UCL	95% LCL	CPUE	95% UCL
Alewife	-1.62	2.05	5.72	-0.13	0.13	0.38	-0.69	1.05	2.79		0.00	
American Eel	0.03	0.35	0.68	0.05	0.18	0.30	0.09	0.26	0.43	-0.07	0.14	0.34
Atlantic Salmon		0.00			0.00			0.00		-0.05	0.05	0.14
Black Crappie	-0.03	0.03	0.08	-0.02	0.10	0.22	-0.00	0.06	0.13	0.01	0.36	0.71
Bluegill	0.58	1.49	2.39	0.49	1.60	2.71	0.84	1.55	2.25	1.80	4.68	7.56
Brown Bullhead		0.00		-0.03	0.03	0.08	-0.01	0.01	0.04		0.00	
Brown Trout		0.00		-0.03	0.03	0.08	-0.01	0.01	0.04		0.00	
Chain Pickerel	0.06	0.19	0.32	-0.02	0.05	0.12	0.04	0.12	0.19	-0.04	0.09	0.22
Common Shiner	-0.98	1.76	4.49		0.00		-0.45	0.84	2.14		0.00	
Eastern Silvery Minnow	-0.39	0.38	1.15		0.00		-0.18	0.18	0.54		0.00	
Fallfish	0.47	1.59	2.72	0.06	0.53	0.99	0.45	1.04	1.63		0.00	
Golden Shiner	0.26	1.08	1.90	-0.06	0.68	1.41	0.33	0.87	1.41		0.00	
Largemouth Bass	1.47	4.70	7.94	2.30	3.75	5.20	2.52	4.21	5.90	1.30	4.00	6.70
Margined Madtom	-0.03	0.03	0.08	-0.02	0.05	0.12	-0.01	0.04	0.08		0.00	
Pumpkinseed	0.08	0.22	0.36	0.05	0.38	0.70	0.12	0.30	0.48	-0.00	1.45	2.91
Redbreast Sunfish	0.37	0.76	1.14	0.84	1.95	3.06	0.77	1.38	1.99	0.06	0.41	0.76
Rock Bass	0.04	0.19	0.34	-0.03	0.03	0.08	0.03	0.10	0.18	-0.01	0.36	0.74
Smallmouth Bass	0.29	2.49	4.68	0.64	1.48	2.31	0.84	1.96	3.08	-0.12	1.59	3.30
Spottail Shiner	-1.81	50.27	102.4	0.22	5.80	11.38	2.08	27.17	52.25		0.00	
Tessellated Darter	0.04	0.19	0.34	-0.00	0.18	0.35	0.07	0.18	0.30		0.00	
White Sucker	0.89	1.65	2.41	0.43	1.18	1.92	0.88	1.40	1.93	-0.14	0.50	1.14
Yellow Perch	0.64	1.78	2.92	0.08	0.25	0.42	0.42	0.99	1.56	-0.03	0.32	0.66
Total	18.63	71.27	123.9	11.97	18.33	24.68	18.17	43.77	69.36	6.91	13.95	21.00

Table 2-7. Total catch (N) and relative abundance (%) of fishes caught by trapnet in Upper Hooksett Pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2 & 3), Hooksett Pool (Monitoring Stations 1, 2, & 3) and the Merrimack Station cooling canal (Monitoring Stations 4 & 5) during 2004.

	Zone							
	Upper Hooksett Pool		Lower Hooksett Pool		Hooksett Pool		Canal	
Common Name	N	%	N	%	N	%	N	%
American Eel	5	1.9	3	1.3	8	1.6	0	0.0
Black Crappie	3	1.1	7	3.1	10	2.0	8	5.4
Bluegill	4	1.5	34	15.0	38	7.7	31	20.8
Brown Bullhead	2	0.8	2	0.9	4	0.8	1	0.7
Chain Pickerel	1	0.4	0	0.0	1	0.2	0	0.0
Eastern Silvery Minnow	4	1.5	0	0.0	4	0.8	0	0.0
Fallfish	6	2.3	0	0.0	6	1.2	0	0.0
Golden Shiner	2	0.8	0	0.0	2	0.4	0	0.0
Largemouth Bass	0	0.0	2	0.9	2	0.4	6	4.0
Margined Madtom	1	0.4	0	0.0	1	0.2	0	0.0
Pumpkinseed	1	0.4	3	1.3	4	0.8	4	2.7
Redbreast Sunfish	8	3.0	13	5.7	21	4.3	14	9.4
Rock Bass	31	11.7	24	10.6	55	11.2	17	11.4
Smallmouth Bass	61	22.9	95	41.9	156	31.6	68	45.6
Spottail Shiner	100	37.6	32	14.1	132	26.8	0	0.0
White Sucker	24	9.0	7	3.1	31	6.3	0	0.0
Yellow Bullhead	3	1.1	2	0.9	5	1.0	0	0.0
Yellow Perch	10	3.8	3	1.3	13	2.6	0	0.0
Total	**266**	**100.0**	**227**	**100.0**	**493**	**100.0**	**149**	**100.0**

Table 2-8. Mean CPUE (fish per 48 h) and 95% confidence limits of fishes caught by trapnet in Upper Hooksett Pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2 & 3), Hooksett Pool (Monitoring Stations 1, 2, & 3) and the Merrimack Station cooling canal (Monitoring Stations 4 & 5) during 2004.

	Zone															
	Upper Hooksett Pool				Lower Hooksett Pool				Hooksett Pool				Canal			
Common Name	95% LCL	CPUE	95% UCL	N	95% LCL	CPUE	95% UCL	N	95% LCL	CPUE	95% UCL	N	95% LCL	CPUE	95% UCL	N
American Eel	-0.05	0.16	0.37	32	-0.05	0.10	0.24	32	0.00	0.13	0.25	64		0.00		28
Black Crappie	-0.10	0.10	0.29	32	-0.02	0.22	0.47	32	0.01	0.16	0.31	64	0.01	0.29	0.57	28
Bluegill	0.00	0.12	0.24	32	0.43	1.06	1.70	32	0.26	0.59	0.93	64	0.37	1.11	1.85	28
Brown Bullhead	-0.03	0.06	0.15	32	-0.03	0.06	0.15	32	0.00	0.06	0.12	64	-0.04	0.04	0.11	28
Chain Pickerel	-0.03	0.03	0.10	32		0.00		32	-0.02	0.02	0.05	64		0.00		28
Eastern Silvery Minnow	-0.07	0.13	0.33	32		0.00		32	-0.04	0.06	0.16	64		0.00		28
Fallfish	-0.01	0.19	0.39	32		0.00		32	-0.00	0.09	0.19	64		0.00		28
Golden Shiner	-0.07	0.06	0.19	32		0.00		32	-0.03	0.03	0.10	64		0.00		28
Largemouth Bass		0.00		32	-0.03	0.06	0.15	32	-0.01	0.03	0.07	64	-0.03	0.22	0.47	28
Margined Madtom	-0.03	0.03	0.09	32		0.00		32	-0.02	0.02	0.05	64		0.00		28
Pumpkinseed	-0.03	0.03	0.10	32	-0.01	0.09	0.20	32	0.00	0.06	0.12	64	-0.06	0.14	0.35	28
Redbreast Sunfish	0.07	0.25	0.44	32	0.05	0.41	0.77	32	0.13	0.33	0.53	64	0.19	0.50	0.81	28
Rock Bass	0.38	0.98	1.58	32	0.40	0.76	1.12	32	0.53	0.87	1.21	64	-0.07	0.61	1.30	28
Smallmouth Bass	0.91	1.93	2.95	32	1.43	2.96	4.49	32	1.54	2.45	3.35	64	1.27	2.43	3.59	28
Spottail Shiner	-0.89	3.17	7.22	32	-0.71	0.98	2.68	32	-0.08	2.07	4.23	64		0.00		28
White Sucker	-0.24	0.77	1.77	32	-0.02	0.22	0.46	32	-0.01	0.49	1.00	64		0.00		28
Yellow Bullhead	-0.01	0.09	0.20	32	-0.03	0.06	0.16	32	0.01	0.08	0.15	64		0.00		28
Yellow Perch	0.05	0.32	0.59	32	-0.01	0.10	0.21	32	0.06	0.21	0.35	64		0.00		28
Total	**3.44**	**8.42**	**13.40**	**32**	**4.82**	**7.10**	**9.38**	**32**	**5.10**	**7.03**	**8.95**	**92**	**3.54**	**5.35**	**7.15**	**28**

Table 2-9. **Total catch (N) and relative abundance (%) of fishes caught by electrofishing within the Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling), Hooksett Pool (Monitoring Stations 11-15), and the new and old Merrimack Station cooling canals (Monitoring Stations 16-18) during 2005.**

	Zone							
	Ambient		Thermally-influenced		Hooksett Pool		Canals	
Common Name	N	%	N	%	N	%	N	%
American Eel	7	1.2	4	0.9	11	1.1	2	1.1
Atlantic Salmon	0	0.0	0	0.0	0	0.0	1	0.5
Black Crappie	2	0.3	2	0.5	4	0.4	9	4.8
Bluegill	46	7.7	86	19.6	132	12.8	43	23.1
Brown Trout	0	0.0	1	0.2	1	0.1	0	0.0
Chain Pickerel	1	0.2	2	0.5	3	0.3	4	2.2
Common Carp	1	0.2	0	0.0	1	0.1	0	0.0
Eastern Silvery Minnow	4	0.7	0	0.0	4	0.4	0	0.0
Fallfish	151	25.4	3	0.7	154	14.9	0	0.0
Golden Shiner	9	1.5	13	3.0	22	2.1	3	1.6
Largemouth Bass	78	13.1	59	13.5	137	13.3	35	18.8
Margined Madtom	0	0.0	2	0.5	2	0.2	0	0.0
Pumpkinseed	6	1.0	19	4.3	25	2.4	9	4.8
Redbreast Sunfish	30	5.1	53	12.1	83	8.0	3	1.6
Rock Bass	1	0.2	0	0.0	1	0.1	3	1.6
Smallmouth Bass	24	4.0	44	10.0	68	6.6	15	8.1
Spottail Shiner	94	15.8	84	19.2	178	17.2	4	2.2
Tessellated Darter	10	1.7	6	1.4	16	1.6	1	0.5
White Perch	1	0.2	0	0.0	1	0.1	1	0.5
White Sucker	71	12.0	47	10.7	118	11.4	9	4.8
Yellow Perch	58	9.8	13	3.0	71	6.9	44	23.7
Total	**594**	**100.0**	**438**	**100.0**	**1032**	**100.0**	**186**	**100.0**

Table 2-10. Mean CPUE (fish per 1,000 ft transect) and 95% confidence limits of fishes caught by electrofishing within the Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling), Hooksett Pool (Monitoring Stations 11-15), and the new and old Merrimack Station cooling canals (Monitoring Stations 16-18) during 2005.

	Zone											
	Ambient (N=45)			Thermally-influenced (N=34)			Hooksett Pool (N=79)			Canals (N=24)		
Common Name	**95% LCL**	**CPUE**	**95% UCL**	**95% LCL**	**CPUE**	**95% UCL**	**95% LCL**	**CPUE**	**95% UCL**	**95% LCL**	**CPUE**	**95% UCL**
American Eel	0.05	0.16	0.27	-0.07	0.12	0.31	0.04	0.14	0.24	-0.04	0.08	0.20
Atlantic Salmon		0.00			0.00			0.00		-0.04	0.04	0.13
Black Crappie	-0.05	0.04	0.13	-0.02	0.06	0.14	-0.01	0.05	0.11	-0.32	0.38	1.07
Bluegill	0.34	1.02	1.70	0.77	2.53	4.29	0.83	1.67	2.51	0.73	1.79	2.86
Brown Trout		0.00		-0.03	0.03	0.09	-0.01	0.01	0.04		0.00	
Chain Pickerel	-0.02	0.02	0.07	-0.02	0.06	0.14	-0.01	0.04	0.08	-0.10	0.17	0.44
Common Carp	-0.02	0.02	0.07		0.00		-0.01	0.01	0.04		0.00	
Eastern Silvery Minnow	-0.05	0.09	0.23		0.00		-0.03	0.05	0.13		0.00	
Fallfish	-1.76	3.36	8.47	-0.01	0.09	0.19	-0.94	1.95	4.84		0.00	
Golden Shiner	0.01	0.20	0.39	-0.03	0.38	0.79	0.08	0.28	0.48	-0.06	0.13	0.31
Largemouth Bass	0.18	1.73	3.28	0.77	1.74	2.70	0.78	1.73	2.69	0.64	1.46	2.27
Margined Madtom		0.00		-0.06	0.06	0.18	-0.03	0.03	0.08		0.00	
Pumpkinseed	-0.00	0.13	0.27	0.24	0.56	0.88	0.15	0.32	0.48	-0.05	0.38	0.80
Redbreast Sunfish	0.15	0.67	1.18	0.67	1.56	2.45	0.57	1.05	1.53	-0.02	0.13	0.27
Rock Bass	-0.02	0.02	0.07		0.00		-0.01	0.01	0.04	-0.06	0.13	0.31
Smallmouth Bass	0.24	0.53	0.82	0.72	1.29	1.87	0.56	0.86	1.16	0.15	0.63	1.10
Spottail Shiner	0.46	2.09	3.72	-0.04	2.47	4.98	0.86	2.25	3.65	-0.04	0.17	0.37
Tessellated Darter	-0.07	0.22	0.51	-0.13	0.18	0.48	-0.00	0.20	0.41	-0.04	0.04	0.13
White Perch	-0.02	0.02	0.07		0.00		-0.01	0.01	0.04	-0.04	0.04	0.13
White Sucker	0.85	1.58	2.30	-0.46	1.38	3.22	0.62	1.49	2.36	-0.03	0.38	0.78
Yellow Perch	0.21	1.29	2.37	0.08	0.38	0.68	0.27	0.90	1.52	-1.19	1.83	4.85
Total	**6.27**	**13.20**	**20.13**	**8.71**	**12.88**	**17.06**	**8.81**	**13.06**	**17.32**	**3.29**	**7.75**	**12.21**

Table 2-11. Total catch (N) and relative abundance (%) of fishes caught by trapnet in Upper Hooksett Pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2 & 3), Hooksett Pool (Monitoring Stations 1, 2, & 3) and the Merrimack Station cooling canal (Monitoring Stations 4 & 5) during 2005.

	Zone							
	Upper Hooksett Pool		Lower Hooksett Pool		Hooksett Pool		Canal	
Common Name	N	%	N	%	N	%	N	%
Black Crappie	0	0.0	1	1.0	1	0.7	7	10.1
Bluegill	3	7.7	10	10.3	13	9.6	8	11.6
Eastern Silvery Minnow	2	5.1	0	0.0	2	1.5	0	0.0
Margined Madtom	0	0.0	2	2.1	2	1.5	0	0.0
Pumpkinseed	0	0.0	0	0.0	0	0.0	2	2.9
Redbreast Sunfish	3	7.7	20	20.6	23	16.9	1	1.4
Rock Bass	6	15.4	5	5.2	11	8.1	1	1.4
Smallmouth Bass	17	43.6	57	58.8	74	54.4	48	69.6
Spottail Shiner	3	7.7	0	0.0	3	2.2	0	0.0
Sunfish Family	0	0.0	0	0.0	0	0.0	1	1.4
Tessellated Darter	1	2.6	0	0.0	1	0.7	0	0.0
White Perch	0	0.0	0	0.0	0	0.0	1	1.4
White Sucker	4	10.3	0	0.0	4	2.9	0	0.0
Yellow Perch	0	0.0	2	2.1	2	1.5	0	0.0
Total	**39**	**100.0**	**97**	**100.0**	**136**	**100.0**	**69**	**100.0**

Table 2-12. Mean CPUE (fish per 48 h) and 95% confidence limits of fishes caught by trapnet in Upper Hooksett Pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2 & 3), Hooksett Pool (Monitoring Stations 1, 2, & 3) and the Merrimack Station cooling canal (Monitoring Stations 4 & 5) during 2005.

	Zone															
	Upper Hooksett Pool				Lower Hooksett Pool				Hooksett Pool				Canal			
Common Name	95% LCL	CPUE	95% UCL	N	95% LCL	CPUE	95% UCL	N	95% LCL	CPUE	95% UCL	N	95% LCL	CPUE	95% UCL	N
Black Crappie		0.00		20	-0.05	0.05	0.15	21	-0.02	0.02	0.07	41	-0.14	0.31	0.77	22
Bluegill	-0.08	0.15	0.38	20	0.06	0.48	0.90	21	0.08	0.32	0.56	41	0.04	0.37	0.69	22
Eastern Silvery Minnow	-0.11	0.10	0.31	20		0.00		21	-0.05	0.05	0.15	41		0.00		22
Margined Madtom		0.00		20	-0.11	0.10	0.31	21	-0.05	0.05	0.16	41		0.00		22
Pumpkinseed		0.00		20		0.00		21		0.00		41	-0.11	0.10	0.30	22
Redbreast Sunfish	-0.07	0.15	0.37	20	-0.48	0.98	2.45	21	-0.16	0.58	1.31	41	-0.05	0.05	0.15	22
Rock Bass	-0.01	0.30	0.60	20	-0.01	0.24	0.48	21	0.08	0.27	0.45	41	-0.05	0.04	0.14	22
Smallmouth Bass	0.18	0.86	1.54	20	0.52	2.78	5.04	21	0.65	1.84	3.04	41	0.12	2.23	4.34	22
Spottail Shiner	-0.08	0.15	0.37	20		0.00		21	-0.04	0.07	0.18	41		0.00		22
Sunfish Family		0.00		20		0.00		21		0.00		41	-0.05	0.05	0.15	22
Tessellated Darter	-0.05	0.05	0.15	20		0.00		21	-0.02	0.02	0.07	41		0.00		22
White Perch		0.00		20		0.00		21		0.00		41	-0.05	0.05	0.14	22
White Sucker	-0.09	0.19	0.48	20		0.00		21	-0.04	0.09	0.23	41		0.00		22
Yellow Perch		0.00		20	-0.11	0.10	0.31	21	-0.05	0.05	0.16	41		0.00		22
Total	**0.66**	**1.94**	**3.23**	**20**	**1.28**	**4.73**	**8.19**	**21**	**1.94**	**3.31**	**4.68**	**41**	**1.11**	**3.19**	**5.28**	**22**

3.0 INTERANNUAL ABUNDANCE TRENDS FROM THE 1967-2005 SAMPLING PROGRAM

3.1 OVERVIEW

Population trend analysis of RIS abundance in the Ambient and Thermally-influenced portions of Hooksett Pool was used to examine the available fisheries data for evidence supporting a finding of "no prior appreciable harm" caused by Merrimack Station's operations, which have not changed appreciably with respect to cooling water withdrawal and discharge since Unit 2 first became operational in 1968 (Normandeau 2006). The electrofishing and trapnet field sampling design for the Merrimack River fisheries survey in each year from 1967 through 2005 was first examined prior to trend analysis to identify all periods of comparable gear, Monitoring Stations, months, and monthly efforts that are of known and certain documentation, so that the statistical trend analysis would be unbiased by changes in sampling design or methods. The occurrence and relative abundance (CPUE) of each RIS of fish found in Hooksett Pool was described during each year of known and consistent sampling in the 1967-2005 period. Theoretically, CPUE should be directly proportional to the abundance of fish in the stock, but sampling design characteristics such as gear, season, location, water temperature, water level, turbidity and river currents can influence this proportionality (Hubert, Chapter 6 in Nielsen and Johnson 1983; Guland 1988). Therefore, it is important to standardize these sampling design characteristics to insure that CPUE retains the same proportional relationship to fish stock abundance among years and is not influenced by changes in design for this multi-year trend analysis.

A nonparametric Mann-Kendall test was then applied to examine the consistent 1967-2005 time series of fisheries data for significant increasing or decreasing trends (Helsel and Hirsch 1991, Chapter 12) in annual total catch per unit of effort (CPUE) for each RIS. The Mann-Kendall test is robust with respect to parametric assumptions of data normality and variance heterogeneity (Helsel and Hirsch 1991; Siegel 1956), and was performed on untransformed annual total CPUE. The null hypothesis was that there is no statistically significant ($p<0.05$) interannual trend in abundance during the period analyzed as measured by the Kendall Tau b correlation coefficient. If a statistically significant negative (decreasing) trend was observed, it was interpreted with respect to whether the Station's thermal discharge may be a contributing factor by examining the time series trend in a subset of the data representing the population of RIS in the Thermally-influenced portion of Hooksett Pool compared to the population of RIS in the ambient water upstream from the influence of Merrimack Station's thermal discharge. Finding no significant trend over time or finding a significant increasing trend was considered to statistically support a finding of "no prior appreciable harm."

3.1.1 Data Selection

3.1.1.1 Electrofishing Time Series Data 1967 through 2005

Table 3-1 presents the sampling design comparison of the electrofishing surveys conducted in Hooksett Pool during select years between 1967 and 2005. Electrofish data from the years of 1967, 1968, and 1969 were first described in a 1969 report by Normandeau (1969), although the actual field sampling is more properly credited to NHFG which used these data to prepare the 1971 New Hampshire Fish and Game Department Merrimack River Thermal Study Report (Wightman 1971).

The following description of the electrofishing sampling design and methods is summarized from Wightman (1971). During this three-year sampling program (1967-1969), Hooksett Pool was divided into Areas 1 and 2. Area 1 was defined as the "Ambient" reach of Hooksett Pool from Garvin's Falls downstream to the Merrimack Station cooling canal discharge, and Area 2 was the Thermally-influenced reach of Hooksett Pool from the Merrimack Station cooling canal discharge downstream to Hooksett Dam (Figure 3-1). Amoskeag Pool, located below Hooksett Dam, was sampled as Area 3 (Wightman 1971). The following excerpt provides the only methodological summary of the electrofishing effort upon which the 1967-1969 Wightman (1971) report results were based.

- "Area 1, the north section was shocked on both sides as far north as N-10, while Area 2 was shocked in its entirety all years of the study. Area 3 was shocked in 1968 and 1969, a distance of ¾ miles below the Hooksett Dam."

These 1967-1969 electrofishing data (Wightman 1971) were presented for each of the three Areas as the percent species composition for each year sampled, without indicating the months in the year sampled. A breakdown of catch by species and date and Area was not provided for the electrofishing data in Wightman (1971), nor were defined sampling transects established to standardize electrofishing catch by season and month. Also, the raw counts of fish captured at standardized electrofishing transects were not available to allow reconstruction of the data from the 1967 through 1969 sampling in a manner consistent with subsequent, well documented sampling programs. Therefore, due to variable and undocumented procedures required for consistent calculation of CPUE, the 1967 through 1969 electrofishing data from Hooksett Pool and from Amoskeag Pool (Wightman 1971) was not used for the multi-year, quantitative trend analysis of CPUE presented in this report. The electrofishing data from Wightman (1971) is primarily useful for qualitative analysis to provide insight regarding the presence and absence of species in Hooksett Pool during 1967 through 1969.

The electrofish data collected by NHFG during 1967-1969 (Wightman 1971) were also analyzed by Normandeau Associates (Normandeau 1969). The Normandeau report attempted to summarize the fisheries studies from 1969 and compare the findings with the results from the 1967 and 1968 studies. Similar to the Wightman report, a breakdown of electrofishing catch by Hooksett Pool Monitoring Station is not provided for any of the three years of sampling. Raw and scaled numbers of fish for areas north and south of the Station are provided. Total catch for each species north of the Station was scaled by a factor of 1.67 to account for the greater linear distance sampled south of the Station (12,500 ft versus 7,500 ft). This scaling assumed a uniform distribution of all fish species present north of the Station, and also reveals that the electrofishing effort for each sampling event during 1967-1969 was considerably more extensive than in subsequent years. Due to the lack of documented electrofishing catch within the specific Hooksett Pool Monitoring Stations (e.g., N9 – N10), 1967 through 1969 electrofishing data from Hooksett Pool and from Amoskeag Pool were not used for the multi-year, quantitative trend analysis of CPUE presented in this report.

Electrofishing data collected by Normandeau during 1972, 1973, 1974, 1975, 1976, 1995, 2004, and 2005 were obtained from consistent and well documented procedures, even though the sampling effort varied among months in some of these years due to environmental conditions that influenced effective sampling (typically storm events that caused high flows and high water conditions). Post hoc examination of the electrofishing data among these years identified August and September as the only months with consistent sampling design and effort applied to the same Monitoring Stations, thus providing the maximum number of months and years of historic data for population trends analysis.

3.1.1.2 Trapnet Time Series Data 1967 through 2005

Table 3-2 presents the sampling design comparison of the trapnet surveys conducted in Hooksett Pool during select years between 1967 and 2005. Trapnet data from the years of 1967, 1968, and 1969 were first described in a 1969 report by Normandeau (1969), although the actual field sampling is more properly credited to NHFG, which used these data to prepare the 1971 New Hampshire Fish and Game Department Merrimack River Thermal Study Report (Wightman 1971). The following description of the trapnet sampling design and methods is summarized from Wightman (1971). During this three-year sampling program, Hooksett Pool was divided into Areas 1 and 2. Area 1 was defined as running from Garvin's Falls to the Merrimack Station cooling canal discharge and Area 2 ran from the Merrimack Station cooling canal downstream to Hooksett Falls Dam (Figure 3-2). Amoskeag Pool, located below Hooksett Falls Dam, was sampled as Area 3. A total of 15 trapnet Monitoring Stations (N1-N15) were located in Area 1, 24 Monitoring Stations (S1-S24) in Area 2 and 71 Monitoring Stations in Area 3. The 1971 NHFG (Wightman) Report did not provide information for Areas 1 and 2 that detailed whether nets were fished on the east, west, or both banks, nor did it provide any information on which Monitoring Stations were fished and on what specific dates during the three-year program. Data collection during the three-year period took place during the months of June and July in Areas 1 and 2 and during the month of August in Area 3. Effort was summarized for each of the three Areas as number of "net days" per year; however "net day" was not defined by a number of hours per set. From the number of Monitoring Stations sampled in Areas 1, 2 and 3, it is evident that considerably more trapnet sampling effort was expended during 1967-1969 than in subsequent years of known and documented effort. In addition, the physical specifications of the sampling gear used are not provided, such as mesh size, hoop size and shape, and the lengths of the trap wings and lead. Within the 1971 NHFG (Wightman) report, data was presented in tabular format consisting of number of individuals, by species for the summer period as a whole. A breakdown of catch by species and date is not provided. Effort is not documented in the text and a balanced sample design does not appear to be maintained as data was compared across time and Monitoring Stations, as evidenced by the following excerpts from Wightman (1971):

- "Although netting was not as extensive in 1969, it is felt a representative sample was derived and data obtained was treated as such."
- "An attempt was made to keep netting effort equal in Areas 1 and 2 during the 1968 season, however, high waters caused a suspension of netting activities twice during this period due to nets fouling."

While these 1967-1969 trapnet data could be useful in an evaluation of fish species presence and absence among years, the lack of documented effort and sampling location led to its being dropped from consideration for inclusion in the multi-year trend analysis of CPUE.

The trapnet data collected by the NHFG during 1967-1969 (Wightman 1971) were also analyzed by Normandeau Associates (Normandeau 1969). The Normandeau report attempted to summarize the fisheries studies from 1969 and compare the findings with the results from the 1967 and 1968 studies. Trapnet fisheries data presented in Normandeau (1969) were in the form of Population Catch Indices which were intended to reflect the catch per unit of effort by Monitoring Station or Area. Catch Indices were calculated by dividing the number of fish caught at a site by a unit of effort. Unit of effort was defined as the number of days in which nets were tended at each location. However, poor documentation of the specific effort at each trapnet Monitoring Station during the 1967-1969 field seasons led to difficulties in the determining effort for a given Monitoring Station, as evidenced by the following excerpt from Normandeau (1969):

- "Although some inherent difficulties were encountered in establishing the number of days for each location, it is believed that the calculated index represents a valid means of assessing changes in populations for each sampling site over a period of time."

In addition to the lack of information regarding the number of net sets at specific locations, there is no raw fish catch data presented in the 1969 Normandeau report. Similar to the Wightman report (1971), no information on whether nets were fished on the east or west banks or what types of nets were fished (mesh size, hoop shape, hoop size, wing and lead lengths, etc) was provided. Without data available in the form of catch sorted by species, month and trapnet location, the 1967 through 1969 trapnet data from Hooksett Pool and Amoskeag Pool was not used for the multi-year, quantitative trend analysis of CPUE presented in this report.

Trapnet data were collected by Normandeau during 1972 to 1976, 1978, 1995, 2004 and 2005. Trapnets used during all years of Normandeau sampling were of ¾-inch mesh, with the exception of 1995, when a 2-inch mesh was used. The 1995 data were dropped from the overall data set because an analysis of paired samples with ¾-inch and 2-inch mesh sets showed that ¾-inch nets caught more species and more small fish than 2-inch nets, and that 2-inch nets captured more large fish than ¾-inch net sets. For this reason, the 2-inch mesh nets were determined not to be compatible for multi-year trend analysis of CPUE.

An examination of the recorded methods and results obtained by Normandeau in the 1970's (1972 through 1976, 1978) revealed discrepancies in the sampling design and possible inconsistencies in set duration and set frequency among years that affects the relationship between CPUE and stock abundance, as was seen when comparing the trapnet catch between 2004 and 2005 (Section 2.4.3 above). The trapnet data were standardized to remove the effects of these discrepancies and inconsistencies prior to the performance of the historical trend analysis, in the following manner.

To verify that trapnet (fyke net) sampling designs were consistent among the programs conducted during the 1970's and in 2004 and 2005 with respect to Monitoring Station, duration (48 h sets), and frequency of sampling (twice monthly at each Monitoring Station), the gear deployment descriptions from the methods sections of each of the corresponding annual reports from the 1970's were examined and presented below:

- **1972**: "Four fyke netting stations (N-10 East, N-10 West, S-4 East and S-2 West) were sampled monthly from August through October… Nets were set twice within one-week for periods of two days each month." (Normandeau 1973).
- **1973**: "Four fyke netting stations (N-10 East, N-10 West, S-3 East and S-2 West) were sampled monthly from June through October… Nets were set twice per week for two day periods for a total of 16 net days each month." (Normandeau 1974).
- **1974**: "Four fyke netting stations (N-10 East, N-10 West, S-3 East and S-2 West) were sampled monthly from May through October… Nets were set twice per week for two day periods for a total of 16 net-days per month." (Normandeau 1975).
- **1975**: "Four fyke netting stations (N-10 East, N-10 West, S-3 East and S-2 West) were sampled monthly from May through October… Nets were set twice per week for two-day periods for a total of 16 net-days each month at each station." (Normandeau 1976).

- **1976**: "Four fyke netting stations (N-10-E, N-10-W, S-3-E and S-2-W) were sampled monthly from May through October… Paired nets were set twice per week for two-day periods, yielding 16 net-nights per month." (Normandeau 1977).
- **1978**: "Four fyke netting stations (N-10-E, N-10-W, S-3-E and S-2-W) were sampled monthly from May through October... Paired nets were set twice per week for two-day periods, yielding 16 net-nights per month." (Normandeau 1979).

Due to the slight variances between the reported descriptions of trapnet effort during the 1970's, each sample year was examined to verify that sampling effort had indeed been two 48 hour net sets per month at the same set of Monitoring Stations. Upon initial examination of the 1970's annual reports describing the trapnet sampling design, sampling dates were provided within the total catch tables for the years of 1974, 1975 and 1976. The sample dates provided in those tables confirmed that the number of 48-hour trapnet sets per site and month was two. To verify sampling design consistency for trapnet soak time (48 h) and sampling frequency (twice month per Monitoring Station), the original field data sheets for each year sampled in the 1970's were obtained and keypunched for examination using the same software applied to analyze the 2004 and 2005 data. It should be noted that analysis of field fisheries data from the 1970's predated the advent of modern business computing and was largely performed by hand. Each sampling event was assigned a unique sample number and Use Code based on the presence or absence of catch and field notes detailing problems encountered with each set. Use Codes were defined by the 2004 and 2005 SOPs that governed all sampling activities (Normandeau 2004, 2005).

Following keypunching of the 1970's data, total catch tables were generated for each year in a format that corresponded to that year's annual report. The total catch tables in the annual reports presented for the 1972 and 1973 data did not separate catch by Monitoring Station, but rather presented a monthly total for each species "north" and "south" of Merrimack Station. The complete set of 1972 and 1973 field data sheets were not available, and as a result, the summary table of trapnet catch for those two years could not be verified by duplication of sampling design. Due to these uncertainties and the lack of specific sampling design information needed to verify the sampling design as consistent with the later years, the 1972 and 1973 data were removed from the historical trends analysis. For the years 1974, 1975, 1976 and 1978, complete sets of field data sheets were available and used to validate the annual study design as consistent among years. This re-analysis of the 1978 trapnet data revealed a discrepancy between the Monitoring Stations fished as recorded on the field data sheets and those presented in the annual report. Accordingly, the 1978 trapnet data were dropped from the historical trend analysis presented in this report.

Total catch tables from the 1974, 1975 and 1976 reports were compared with those generated by the keypunched data from the original field data sheets (all Use Codes). Table 3-3 presents the differences between the reported values and those from the field data sheets, sorted by species, Monitoring Station and month. A total of 34 discrepancies were discovered among the three years (seven in 1974, two in 1975 and 25 in 1976). The tables of mean CPUE (as reported in the 1974, 1975, and 1976 NAI reports) were then generated for each year using the corrected total catch from the original field datasheets for all Use Code 1 samples. To compare the newly generated tables of mean CPUE's to the corresponding tables presented in the 1974 report, mean CPUE was calculated by averaging the $\log_e(x+1)$ $CPUE_{48}$ (fish per 48 h soak time) for each Monitoring Station per month. To compare the newly generated tables of mean CPUE's to the corresponding tables presented in the

1975 and 1976 reports, mean CPUE was calculated by averaging the $\log_{10}(x+1)$ $CPUE_{24}$ (fish per 24 h soak time) for each Monitoring Station per month.

Mean trapnet CPUE values (fish caught per 24 h) corresponded between those values reported in the annual reports and the tables generated from the original field data sheets. Instances where the two values did not agree were due either to the use of samples that under current classification would not be considered valid for CPUE calculation (for example, a twisted or rolled net that was not in proper fishing position for the entire 48-hour period), or to the use of a misentered catch value from the annual report table.

Because sampling months varied among years, a comparable time period of May through September for the years 1974, 1975, 1976, 2004 and 2005 was fished in all years and therefore selected for use in the historical trend analysis. This decision was based on selecting the maximum number of months that would cover the greatest number of years of historic data. Due to the removal of the 1995 dataset from the trapnet trends analysis, the remaining years were pooled into two groups, the 1970's and 2000's, to provide a "then and now" comparison, as opposed to the decade by decade trend analysis performed for the electrofishing data.

3.1.2 Data Grouping

Similar to the analysis conducted on the 2004 and 2005 electrofishing catch data (Section 2.2.3.1 above), a quantitative approach was used to classify the results from the Monitoring Stations into two strata or zones in Hooksett Pool, an Ambient zone located upstream from the influence of Merrimack Station's thermal discharge, and a downstream or Thermally-influenced zone. Classification of the fisheries data into these two zones was based upon the measured water temperature at the time of sampling. For each standardized month sampled (e.g., August and September for electrofishing), the average water temperature (as measured at the time of sampling) for Monitoring Stations 11 and 12 was calculated. This average temperature for the Ambient zone represented the upstream thermal condition of Hooksett Pool before the contribution of Merrimack Station's thermal discharge due to the location of these two Monitoring Stations upstream from the cooling canal discharge into Hooksett Pool. A value of 3.182 (t-value at $\alpha = 0.05$ for 3 degrees of freedom) times the standard error was added to the mean measured water temperature values from the upstream Ambient Monitoring Stations for each monthly sampling event in each year. The resulting value should contain 95% of the values representative of the mean and provides the upper bound separating the values representative of the mean (Ambient) from those warmer than Ambient (Thermally-influenced). For each month of electrofishing sampling within each year, Monitoring Stations were classified as Ambient or Thermally-influenced based upon their thermal conditions at the time of sampling (Table 3-4). For the purposes of this report, electrofishing Monitoring Stations that had water temperatures at the time of sampling that were within 95% of the mean will be referred to as "Ambient" and those which did not will be referred to as "Thermally-influenced".

The method of using measured water temperature values at the time of sampling was not appropriate to classify trapnet Monitoring Stations into Ambient and Thermally-influenced due to the nature of the gear. Trapnets are a passive gear that were fished for 48-h periods in each month May through September of 1974-1976 and 2004-2005. Thermal conditions at the trapnet Monitoring Stations likely varied over that time period and as a result, fish caught could not be definitively associated with the water temperature measured nearly instantaneously at the time of initial or final net deployment. Consequently, stratification of the trapnet Monitoring Stations for historical trend analysis was conducted based solely on the geographic location of Monitoring Stations relative to the cooling canal discharge and not based on the water temperature observations associated with these samples. Accordingly, the trapnet data will be presented as "upper Hooksett Pool" and "lower Hooksett Pool".

3.1.3 Data Analysis

Long-term trends in the Hooksett Pool fish stock abundance were analyzed for electrofishing and trapnet data by comparing gear and species-specific CPUE for the data sets that were standardized for sampling design as described above in Sections 3.1.1 and 3.1.2. These same data sets were analyzed to determine the structure of the Hooksett Pool fish community using three common community indices: (1) taxa richness, (2) rank-abundance, and (3) the Bray-Curtis Similarity Index. Length-weight regression equations for four abundant Hooksett Pool species were also determined and compared among years to evaluate the potential for sublethal effects of Merrimack Station's thermal discharge on the growth or condition of these fish stocks. The condition of the fish community was compared among years by examining changes in species guild biomass. The derivation and use of these metrics is described below in the relevant report sections.

3.1.3.1 Catch Per Unit Effort (CPUE)

Catch Per Unit of Effort (CPUE) is commonly used by fisheries scientists as an index of population density or stock size. Theoretically, CPUE should be directly proportional to the abundance of fish in the stock, but sampling design characteristics such as gear, season, location, water temperature, water level, turbidity and river currents can influence this proportionality (Hubert, Chapter 6 in Nielsen and Johnson 1983; Guland 1988). Therefore, it is important to standardize these sampling design characteristics to insure that CPUE retains the same proportional relationship to fish stock abundance among years and is not influenced by changes in design. For this multi-year trend analysis, CPUE was calculated for all species captured by electrofishing during August and September of the selected years of electrofishing data (1972, 1973, 1974, 1976, 1995, 2004 and 2005), and for all species captured by trapnet during May through September of the selected years of trapnet data (1974, 1975, 1976, 2004 and 2005). Electrofishing data available from the 1970's provided a total number of each individual species by Monitoring Station and zone for each month of sampling. Electrofishing CPUE for each year was calculated (number of individuals per 1,000 ft transect) by dividing the total catch from August and September by the number of Monitoring Stations (1,000 ft transects) fished within that zone as determined by thermal conditions at the time of sampling. Prior to calculating any mean CPUE values, the data were "zero-filled" for each taxon, so that any taxon collected within a given year of the study is represented in all three zones of Hooksett Pool. CPUE calculations for electrofishing data from the 1995, 2004 and 2005 sampling periods were handled in the same manner. The 1970's trapnet data provided a total number of each individual species by zone for each month of sampling. By using the known number of 48-hour sets fished in each zone monthly, a CPUE was calculated (number of individuals per 48-hour set) for each month, and monthly values were averaged to provide a yearly value for each species. Similar to the electrofishing data, trapnet data was zero-filled.

A nonparametric Mann-Kendall test was used to examine the time series for significant increasing or decreasing trends (Helsel and Hirsch 1991, Chapter 12) in annual total CPUE. The Mann-Kendall test is robust with respect to parametric assumptions of data normality and variance heterogeneity (Helsel and Hirsch 1991; Siegel 1956), and was performed on untransformed annual total CPUE. The null hypothesis was that there is no statistically significant ($p<0.05$) interannual trend in abundance during the period analyzed as measured by the Kendall Tau b correlation coefficient. If a statistically significant negative (decreasing) trend was observed, it was interpreted with respect to whether the Station's thermal discharge could be a contributing factor by examining the time series trend in a subset of the data representing the population directly exposed to the thermal plume compared to the population outside of the influence of the plume. Finding no significant trend over time or finding a significant increasing trend was considered to statistically support a finding of "no prior appreciable harm."

3.1.3.2 Comparison of Fish Community Structure

Taxa richness is one of several metrics commonly used by fisheries scientists to evaluate community structure (the number of different species). Taxa richness is simply a tabulation of the number of species present within a given area at a given time. For example, if 18 different fish species were caught by electrofishing in the Ambient zone of Hooksett Pool in 2004, then the taxa richness for this set of data was 18. The probability of detection of less common species will increase as effort is increased. As a result, taxa richness should only be compared across time periods where the sampling methodology has been standardized and maintained (Pielou 1974). When combined with other indices of community structure, taxa richness is used to evaluate for potential shifts in the species composition over time within the Hooksett Pool fish community. Taxa richness was calculated as the number of distinct species present in Ambient/upper, Thermally-influenced/lower or the entirety of Hooksett Pool within a given year.

Rank abundance builds on taxa richness as a measure of community structure by incorporating a weight to each species based on its relative abundance to the sampled catch as a whole. Rank abundance is used to evaluate changes among the dominant and rare fish species in the fish community over time or space. For example, if largemouth bass were the first ranked most abundant fish species (rank = 1) in the Ambient zone of Hooksett Pool during the 1970's, but became the sixth most abundant (rank = 6) in the 2000's, then this change in rank would represent a major change in the community structure of that zone over time. Rank abundance is a useful index to assist in demonstrating "no prior appreciable harm" to a community by providing a comparable method to track the relative abundance of the species in the fish community over time and space. Rank abundance of species was calculated for each year of electrofishing and trapnet sampling. Total catch of each taxon was used to order species in terms of abundance.

The Bray-Curtis index of community similarity was used to quantitatively compare the fish communities within the Hooksett Pool among the three decades of sampling. Unlike taxa richness or rank abundance, the Bray-Curtis index (I_{BC}) computes percent similarity among the fish taxa common in two sets of survey data (Clarke 1993). The results of the Bray-Curtis index of similarity are significant for demonstrating "no prior appreciable harm". This index will negate the influence of uncommon fish species that may be present within some years of the comparison. Its power of predicting similarity is based upon species present within both of the data sets being compared. The closer the Bray-Curtis value is to 100%, the more similar the two communities are. A value for the percent difference that the current Hooksett Pool fish community differs from that sampled in previous years can be calculated using this index.

3.1.3.3 Comparison of Length-Weight Relationships

Length-weight relationships describe the mathematical relationship between length and weight of individual fish with the objective of being able to convert one to the other. The slope from the regression equation produced by this relationship reflects the condition or robustness of the fish species for which the equation was developed. The species-specific slope value from the length-weight relationship of catch from multiple years can be compared among years and used to detect changes in the average condition of fish in a system. Degraded habitat conditions that might be caused by a thermal discharge would result in a decreasing slope (less weight for a given length) for a given fish species over time, indicating a reduction in quality of body condition for that population of fish. Length-weight relationships require a sufficient catch of different sizes of each fish species to be sure the slope of the equation is not biased by one or two exceedingly large or small individuals that are not representative of the population being sampled. Length-weight regression equations were generated using SAS PROC GLM for four species – smallmouth bass, largemouth bass, bluegill and yellow perch captured by electrofishing in Hooksett Pool. Sample years were restricted to 1995, 2004 and 2005 due to a lack of length and weight data from the 1970's. The months of May through September were included in this analysis for the three years examined to increase sample sizes.

Analysis of covariance (ANCOVA) was used to compare differences in the length-weight relationships and condition of the four selected species among the three years of data. The data were first examined using scatter diagrams of $\log_{10}$ weight vs. $\log_{10}$ length to insure an adequate sample and a representative range of sizes (points not clustered). Length-weight scatter plots were also used to identify outliers, and the original data values were examined to determine if they were valid or in error. Erroneous values of length or weight for individual fish were either corrected, if possible, or deleted from the length-weight regression analysis if sufficient information was not available to correct the data. Outliers with no information indicating that they were in error were retained for analysis. Regression equations were developed to represent growth curves based on total wet-weight, and ANCOVA was used to compare these growth curves among the three years of available data.

3.1.3.4 Examination of Changes in Species Guild Biomass

Species guild biomass is a measure of condition of fish community structure based on the apportionment of biomass (weight) among levels of the food chain. Species guild biomass is analogous to length-weight analysis as applied to the community (aggregate of fish species) and not to the individual populations of fish species. Finding significant changes in species guild biomass over time is an indication that the fish community has undergone significant changes in structure that may be interpreted with respect to anthropogenic effects such as thermal degradation in the habitat. Fish species present in Hooksett Pool were classified into six trophic guilds: filter feeder, generalist, herbivore, insectivore, omnivore and piscivores (Barbour et al. 1999). Changes in abundance within trophic class as measured by species guild biomass were examined across selected sample years using ANCOVA. The sample years were restricted to 1995, 2004 and 2005 electrofish data only due to a lack of length and weight data from the 1970's. The months of May through September were included in this analysis for the three years examined to increase sample sizes.

3.2 RESULTS OF ELECTROFISHING TREND ANALYSIS

3.2.1 General Catch Characteristics

Table 3-5 shows the electrofishing species catch during August and September of all years with consistent and documented sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005). A total of 22 species were sampled in Hooksett Pool by electrofishing during these months over the seven years included in this analysis. The total number of fish species observed between years varied, ranging from a high of 18 during the 2004 sampling season to a low of 12 during 1972 and 1976. The total catch of individuals during August/September ranged from a low of 446 (2005) fish to a high of 2,663 fish (1995). The total catches for the remaining five years included in this analysis were 1,281 (1972), 725 (1973), 1,049 (1974), 795 (1976), and 956 (2004) fish (Table 3-6).

Of the 22 fish species captured, chain pickerel, largemouth bass, pumpkinseed, redbreast sunfish, smallmouth bass, white sucker and yellow perch were present in Hooksett Pool during all seven years of electrofish sampling. Two species, brown and yellow bullhead, were present in electrofishing samples only during the 1970's. Bluegill and rock bass first appeared in the electrofishing catches in Hooksett Pool during 1995. Likewise, eastern silvery minnow, black crappie and alewife first appeared in the Hooksett Pool electrofishing catches during 2004. American eel, present during the 1970's, was absent from the electrofishing catches during 1995, but was recorded again in Hooksett Pool during electrofishing catches in 2004 and 2005. Spottail shiner were first identified in the Hooksett Pool electrofishing catches during 1974; however, they did not show up in abundance until the 1995, 2004 and 2005 surveys.

3.2.2 Catch per Unit Effort (CPUE)

Figure 3-3 presents the CPUE of total fish (all species combined) captured by electrofishing in Hooksett Pool during August and September of the years with consistent and documented sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005). Among the seven years compared, 1995 was the year with the highest CPUE for both the Ambient and Thermally-influenced zones of Hooksett Pool, as well as the highest CPUE for the entire Hooksett Pool (Table 3-7). The year with the second highest electrofishing CPUE was 1974 for Hooksett Pool (all fish species combined), 2004 for the Ambient zone of Hooksett Pool, and 1974 for the Thermally-influenced zone of Hooksett Pool. Among these seven years, 2005 had the lowest electrofishing CPUE within Ambient and the Thermally-influenced zone of Hooksett Pool as well as for the entire Hooksett Pool. Statistical analysis of the mean electrofishing CPUE among these seven years representing three decades of monitoring in Hooksett Pool revealed that the year to year variation exhibited no statistically significant negative (decreasing) trend in overall annual mean CPUE in Hooksett Pool (all fish species combined), supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this period. The time series of annual total (all fish species combined) electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of -0.238 with a probability level of p=0.453. Trend analysis was also performed on the time series of annual mean electrofishing CPUE separately for each of the two zones within Hooksett Pool, and no statistically significant decreasing trend was observed for the total fish community in either zone, supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this period. The electrofishing time series from the Ambient zone of Hooksett Pool exhibited a Kendall's Tau b of -0.048 with a probability level of p=0.881 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of -0.333 with a probability level of p=0.293 (Table 3-8).

In addition to trend analysis for annual mean electrofishing CPUE for all fish species combined, Table 3-7 also presents the annual mean CPUE for each individual species collected during August and September of the years with consistent and documented sampling effort within the Ambient portion of the upper Hooksett Pool, the Thermally-influenced portion of lower Hooksett Pool, and total Hooksett Pool. The CPUE trends for the five of the seven original RIS species (alewife, smallmouth bass, largemouth bass, pumpkinseed, and yellow perch) along with fallfish and white sucker were presented. The remaining two RIS species, American shad and Atlantic salmon were not present during the August and September time period during any of the seven years sampled.

Figure 3-4 presents the annual mean electrofishing CPUE for alewife captured in Hooksett Pool during August and September of the seven years with consistent and documented sampling effort. Alewife were recorded in electrofishing catches only during 2004. During that year they were present in both the Ambient zone of the upper Hooksett Pool and the Thermally-influenced portion of lower Hooksett Pool (Table 3-7).

Figure 3-5 presents the CPUE for smallmouth bass captured in Hooksett Pool during August and September of the seven years with consistent and documented electrofishing sampling effort. Smallmouth bass CPUE within Hooksett Pool peaked during 2004. Smallmouth bass were present within both zones of Hooksett Pool during each of the seven years compared. The highest annual mean electrofishing CPUE values for the August/September period were greatest for smallmouth bass in the Ambient zone of Hooksett Pool in 2004. Smallmouth bass annual mean CPUE within the Thermally-influenced zone of Hooksett Pool peaked during 1973 and were at their lowest level during 1972 (Table 3-7). No statistically significant negative (decreasing) trend was observed in smallmouth bass annual mean CPUE in Hooksett Pool (Ambient and Thermally-influenced zones combined), supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this four-decade period. The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of 0.238 with a probability level of p=0.453. Trend analysis was also performed on the time series of annual mean electrofishing CPUE for smallmouth bass separately for each of the two zones within Hooksett Pool, and no statistically significant decreasing trends were observed in either zone supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this period. The electrofishing time series for smallmouth bass caught in the Ambient zone of Hooksett Pool exhibited a Kendall's Tau b of 0.333 with a probability level of p=0.293; the time series in the Thermally-influenced zone of Hooksett Pool exhibited a Kendall's Tau b of -0.238 with a probability level of p=0.453 (Table 3-8).

Figure 3-6 presents the CPUE for largemouth bass captured in Hooksett Pool during August and September of the seven years with consistent and documented electrofish sampling effort. Largemouth bass CPUE peaked during 2004 within both Ambient Hooksett Pool and the Thermally-influenced zone of Hooksett Pool. CPUE values for largemouth bass were at their lowest during 1973 within both Ambient Hooksett Pool and the Thermally-influenced zone of Hooksett Pool, along with the entire Hooksett Pool (Table 3-7). No statistically significant negative (decreasing) trend was observed in largemouth bass annual mean CPUE in Hooksett Pool (Ambient and Thermally-influenced zones combined), supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this four-decade period. The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of 0.429 with a probability level of p=0.177. Trend analysis was also performed on the time series of annual mean electrofishing CPUE for largemouth bass separately for each of the two zones within Hooksett Pool, and no statistically significant decreasing trends were observed in either zone supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this period. The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's Tau b of 0.333 with a probability level of p=0.293 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of 0.333 with a probability level of p=0.293 (Table 3-8).

Figure 3-7 presents the CPUE for pumpkinseed captured in Hooksett Pool during August and September of the seven years with consistent and documented sampling effort. Pumpkinseed CPUE peaked during 1972 within both Ambient and Thermally-influenced zones of Hooksett Pool as well as throughout the entire Hooksett Pool. Pumpkinseed CPUE was at its lowest level in Hooksett Pool during 2004. Within the Thermally-influenced zone of Hooksett Pool, pumpkinseed CPUE was lowest during 2004 and within Ambient Hooksett Pool was lowest during 1995, when no individuals were captured (Table 3-7). A statistically significant negative (decreasing) trend was observed in pumpkinseed annual mean CPUE in Hooksett Pool (Ambient and Thermally-influenced zones combined). The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of -0.810 with a probability level of p=0.011. Trend analysis was also performed on the time series of annual mean electrofishing CPUE for pumpkinseed separately for each of the two zones within Hooksett Pool, and a statistically significant decreasing trend was observed in the Thermally-influenced zone while the downward trend in the Ambient zone was not significant. The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's Tau b of -0.619 with a probability level of p=0.051 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of -0.714 with a probability level of p=0.024 (Table 3-8). The overall downward trend can be linked with the success of several introduced species that have established themselves within Hooksett Pool. Introductions of bluegill (early 1980's), rock bass (first detected in 1995) and black crappie (first detected in 2004) have provided competition for the niche previously filled by pumpkinseed. All three of these centrarchid species were most likely introduced to the Hooksett Pool fish community intentionally or unintentionally by recreational anglers. These three species, with bluegill in particular, will compete directly with pumpkinseed for available food resources within Hooksett Pool. Additionally, black crappie and rock bass are both predatory species and will consume small fish such as pumpkinseed. The combined abundance of the three introduced centrarchids exhibits a significant ($r^2 = -0.777$, $p = <.0001$) negative correlation with the abundance of pumpkinseed in Hooksett Pool, supporting this competition hypothesis.

Figure 3-8 presents the CPUE for yellow perch captured in Hooksett Pool during August and September of the seven years with consistent and documented sampling effort. Yellow perch CPUE peaked during 1972 within Hooksett Pool and the Ambient zone of Hooksett Pool. Yellow perch CPUE peaked during 1973 within the Thermally-influenced zone of Hooksett Pool. CPUE values for yellow perch were at their lowest during 1995 within all zones of Hooksett Pool (Table 3-7). No statistically significant negative (decreasing) trend was observed in yellow perch annual mean CPUE in Hooksett Pool (Ambient and Thermally-influenced zones combined), supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge during this four-decade period. The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of -0.619 with a probability level of p=0.051. Trend analysis was also performed on the time series of annual mean electrofishing CPUE for yellow perch separately for each of the two zones within Hooksett Pool, and no statistically significant decreasing trends were observed in either zone, supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this period. The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's

Tau b of -0.429 with a probability level of p=0.177 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of -0.429 with a probability level of p=0.177 (Table 3-8).

Figure 3-9 presents the CPUE for fallfish captured in Hooksett Pool during August and September of the seven years with consistent and documented sampling effort. Fallfish CPUE peaked during 1972 within Hooksett Pool. Within Ambient Hooksett Pool, fallfish CPUE was at its highest during 1972 and at its lowest during 1976, when fallfish were not recorded there. Within the Thermally-influenced zone of Hooksett Pool, fallfish CPUE was at its highest during 2004 and lowest during 1972, 1974, 1976 and 1995, when fallfish were not recorded there (Table 3-7). No statistically significant negative (decreasing) trend was observed in fallfish annual mean CPUE in Hooksett Pool (Ambient and Thermally-influenced zones combined), supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge during this four-decade period. The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of -0.048 with a probability level of p=0.881. Trend analysis was also performed on the time series of annual mean electrofishing CPUE for fallfish separately for each of the two zones within Hooksett Pool, and no statistically significant decreasing trends were observed in either zone, supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this period. The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's Tau b of 0.000 with a probability level of p=1.000 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of 0.394 with a probability level of p=0.241 (Table 3-8).

Figure 3-10 presents the CPUE for white sucker captured in Hooksett Pool during August and September of the seven years with consistent and documented sampling effort. White sucker CPUE within Hooksett Pool peaked during 1974 and was at its lowest values during 1973 and 1995. White sucker have been recorded within the Thermally-influenced zone of Hooksett Pool during four of the seven years of comparable and documented sampling, with their greatest CPUE occurring during 1972. Ambient zone CPUE for white sucker peaked during 1974, and this species has been recorded there during each of the seven years of comparable and documented sampling (Table 3-7). No statistically significant negative (decreasing) trend was observed in white sucker annual mean CPUE in Hooksett Pool (Ambient and Thermally-influenced zones combined), supporting a finding of "no prior appreciable harm" due to Mererimack Station's thermal discharge over this four-decade period. The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of -0.195 with a probability level of p=0.543. Trend analysis was also performed on the time series of annual mean electrofishing CPUE for white sucker separately for each of the two zones within Hooksett Pool, and no statistically significant decreasing trends were observed in either zone supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge over this period. The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's Tau b of -0.195 with a probability level of p=0.543 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of -0.309 with a probability level of p=0.347 (Table 3-8).

The analysis of CPUE data for the seven RIS and the two additionally evaluated species for Merrimack Station supports a finding of "no prior appreciable harm" to the fish community of Hooksett Pool from the Station's thermal discharge over the four-decade period examined. As RIS are defined, conclusions about the interaction of those selected species with the Station's thermal discharge can be applied to other members of the fish community within the same trophic guild and tolerance classification (USEPA 1977). Of the seven RIS currently present within Hooksett Pool, six showed no significant negative (decreasing) trends within the Thermally-influenced zone of Hooksett

Pool. The pumpkinseed was the only species to show a negative trend. However, the CPUE trend for the Ambient zone ($p = 0.051$) was very close to being significantly negative at an α of 0.05, and CPUE trends for the pumpkinseed in all of Hooksett Pool were decreasing. That pumpkinseed have shown significant declines in ambient portions of Hooksett Pool suggests that a factor other than thermal effects from Merrimack Station are responsible for the downward trend. The introductions of three other centrarchid species to Hooksett Pool have led to competition for available resources. Bluegill in particular are a very competitive species. They occupy the same niche as pumpkinseed and will directly compete for the same food sources. This hypothesis of competition is supported by the negative correlation of pumpkinseed CPUE versus that of the three introduced centrarchids during the comparable trends period (1972-2005).

3.2.3 Community Indices

In addition to evaluating trends in species-specific CPUEs, changes in community trends were analyzed through three indices: (1) taxa richness, (2) rank abundance, and (3) the Bray-Curtis Index.

3.2.3.1 Taxa Richness

Taxa richness varied within Hooksett Pool for all taxa captured by electrofishing in Hooksett Pool during August and September of the years with consistent and documented sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005) (Table 3-9). The number of taxa observed during 1972 and 1976 was the lowest of the seven years sampled (12 species), while the taxa richness during 2004 was the greatest of the seven years sampled (18 species). Within the Hooksett Pool time series (1972-2005), taxa richness has shown an overall increase from 12 species sampled during 1972 to 14 sampled in 2005. The number of species captured within Ambient Hooksett Pool ranged from a low of 11 (1995) to a high of 17 (2004). Within the Ambient Hooksett Pool time series (1972-2005), taxa richness has shown an overall increase from 12 species sampled during 1972 to 14 species sampled during 2005. Taxa richness within the Thermally-influenced portion of Hooksett Pool ranged from a low of ten species (1972) to a high of 12 (1973, 1974, 1976, and 2004). Within the Thermally-influenced portion of Hooksett Pool time series (1972-2005), taxa richness has shown an increase from 10 species sampled during 1972 to 11 species during 2005.

Taxa richness of the fish community has increased throughout Hooksett Pool, including in both the Ambient zone and in the Thermally-influenced zone of Hooksett Pool over the four decades of comparable electrofishing sampling (1972 through 2005). Finding an increase and no significant decrease in the number of fish taxa present in Hooksett Pool supports a finding that the continued thermal discharge from Merrimack Station during this four-decade period has not reduced the species richness of the fish community, which in turn is indicative of "no prior appreciable harm" to the fish community of Hooksett Pool from the Station's thermal discharge over the four-decade period examined.

3.2.3.2 Rank Abundance

Comparison of the abundance rankings for fish species captured by electrofishing in Hooksett Pool during August and September of the years with consistent and documented sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005) revealed changes in relative abundances within Hooksett Pool.

Table 3-10 presents the abundance rankings for fish species caught throughout Hooksett Pool. During the 1970's, pumpkinseed were the first-ranked fish taxon during all four years of comparable sampling. During the 1970's yellow perch were the second-ranked taxon during 1972 and 1973, dropping to the fifth and sixth in 1974 and 1976, respectively. Pumpkinseed have decreased in the abundance rankings of the species in Hooksett Pool, as shown by lower abundance rankings during the 1995, 2004 and 2005 sample years. Yellow perch decreased in the abundance rankings during 1995 and 2004 but rebounded to be the third most abundant species during the 2005 sampling. Rank abundance values for bluegill and spottail shiner – two species either absent or present only in low numbers during the 1970's – have risen, and these two species were among the most abundant species during 1995, 2004 and 2005. Largemouth bass and redbreast sunfish have both been within or near the five most abundant species during all seven years sampled, with largemouth bass being the most abundant species sampled in Hooksett Pool during 2005. A comparison of the ranks for RIS species from the initial comparable year of sampling (1972) to the most recent Hooksett Pool sampling (2005) showed few major changes in Hooksett Pool. Pumpkinseed showed the largest downward movement from the first ranked species in 1972 to the seventh in 2005. This drop is supported by the statistically negative (decreasing) trend in CPUE detected by the Mann-Kendall test. Largemouth bass moved from the third ranked position in 1972 to the first position in 2005. Smallmouth bass moved from the ninth ranked species in 1972 to the fourth ranked in 2005. Yellow perch moved from the second to third ranked, white sucker from the seventh to ninth ranked and fallfish showed no change, remaining the sixth ranked species in both 1972 and 2005. Fallfish were absent from the total catch of Hooksett Pool during 1976. Alewife were collected only during 2004 and were the fourth ranked species during that season.

Tables 3-11 and 3-12, respectively, present the abundance rankings for Ambient Hooksett Pool, and the Thermally-influenced zone of Hooksett Pool. In Ambient Hooksett Pool, pumpkinseed declined in rank abundance during 1995, 2004 and 2005 after being the first-ranked species during all four years sampled within the 1970's, similar to the overall pattern observed for Hooksett Pool. Yellow perch also declined in the rankings after being the second most abundant species during 1972 and 1973. However, yellow perch were the second most abundant species in Ambient Hooksett Pool during 2005. Spottail shiners were the first-ranked species during 1995 and 2004, dropping to fifth-ranked during 2005. Bluegill, absent during the 1970's, were the second-ranked species during 1995 and the third most abundant during 2005. Largemouth bass were ranked among the five most abundant species during six of the seven years sampled and were the top-ranked species during 2005. During 2004, downstream migrating, juvenile alewives were the third-ranked species within Ambient Hooksett Pool. A comparison of the ranks for RIS species from the initial comparable year of sampling (1972) to the most recent Hooksett Pool sampling (2005) showed few major changes in Ambient Hooksett Pool. Pumpkinseed showed the largest downward movement from the first ranked species in 1972 to the ninth in 2005. Largemouth and smallmouth bass both moved up in abundance rankings with largemouth bass going from third to first and smallmouth bass moving from ninth to seventh. White sucker declined slightly from the fifth ranked species in 1972 to the eighth ranked in 2005. Yellow perch and fallfish showed no change, remaining the second and fourth ranked species in both 1972 and 2005, respectively. Fallfish were absent from the Ambient zone during 1976.

Within the Thermally-influenced zone of Hooksett Pool, pumpkinseed were the first-ranked species during all four years sampled during the 1970's. They were replaced in 1995 and 2005 by bluegill, and in 2004 by smallmouth bass. Bluegill first appeared during the 1995 electrofish sampling effort and have been within the three most abundant species in each sample year since. Smallmouth and largemouth bass have both been within the five most abundant species during the majority of the years sampled within the Thermally-influenced zone of Hooksett Pool. Redbreast sunfish have been the second-ranked species during five of the seven years of sampling and fourth-ranked during the other two years. Yellow perch, a species absent from the Thermally-influenced zone of Hooksett Pool during 1995 and 2004, were the sixth-ranked species during 2005. A comparison of the ranks for RIS species from the initial comparable year of sampling (1972) to the most recent Hooksett Pool sampling (2005) showed few major changes in the Thermally-influenced zone of Hooksett Pool. Pumpkinseed showed the largest downward movement from the first ranked species in 1972 to the fifth in 2005. This drop is supported by the statistically negative (decreasing) trend in CPUE detected by the Mann-Kendall test. Largemouth bass moved from the third ranked position in 1972 to the second position in 2005. Smallmouth bass moved from the seventh ranked species in 1972 to the third ranked in 2005. Yellow perch moved from the fourth to sixth ranked and fallfish from the eleventh to eighth. Fallfish were present only during 1973, 2004 and 2005. White sucker showed no change, remaining the tenth ranked fish between both 1972 and 2005. White sucker were not detected within the Thermally-influenced zone of Hooksett Pool during 1973, 1995 and 2004.

As the RIS are considered to be representative of the total species community, the analysis of the rank-abundance data for this time period supports a finding of "no prior appreciable harm" to the fish community of Hooksett Pool from the Station's thermal discharge over the four-decade period examined. Within the entirety of Hooksett Pool and within the Thermally-influenced zone of Hooksett Pool, only the pumpkinseed showed a decrease of more than 2 rank positions from initial observations in 1972 to the most recent survey in 2005. Within Ambient Hooksett Pool, pumpkinseeds were the only RIS to show a decrease in rank abundance from the initial 1972 observations to the most recent 2005 survey. As stated previously (Section 3.2.2), this decrease in the pumpkinseed is best explained by the anthropogenic introduction of three centrarchid species, particularly the bluegill, and unrelated to Merrimack Station's thermal discharge. Bluegill went from a rank abundance of zero throughout the 1970's to being the second most abundant species throughout Hooksett Pool during the 1995 and 2005 surveys.

3.2.3.3 Bray-Curtis Percent Similarity Index

Table 3-13 presents a comparison of the fish community sampled by electrofishing within Hooksett Pool during August and September of the years with consistent and documented sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), as computed by the Bray-Curtis Percent Similarity Index. The 1970's Hooksett Pool fish community shows a greater similarity to the 2000's Hooksett Pool fish community than the Hooksett Pool fish community found in 1995. Bray-Curtis similarity between the 1970's and 2000's fish communities was 51%, while Bray-Curtis similarity between the 1970's and 1995 fish communities was only 41%. The percent similarity between the 1995 and 2000's fish communities was 61%. Comparing the 1970's fish community versus the 1995 and the 2000's fish communities, the Bray-Curtis similarity was greater within the Thermally-influenced zone of Hooksett Pool (51% and 56% respectively) than the Ambient zone of Hooksett Pool (30% and 48% respectively). Comparing the 1995 fish community versus the 2000's fish community, the Thermally-influenced zone of Hooksett Pool had a greater community similarity than that found in Ambient Hooksett Pool. The 1995 and 2000's fish communities showed 61% similarity within the Ambient zone of Hooksett Pool and 71% similarity within the Thermally-influenced zone of Hooksett Pool.

The analysis of the Bray-Curtis similarity supports a finding of "no prior appreciable harm" to the fish community of Hooksett Pool from Merrimack Station's thermal discharge over the four-decade period examined. Percent similarities between both the 1995 fish community and that sampled during the 2000's are greater for the Thermally-influenced portion of lower Hooksett Pool than that found in the Ambient zone of the upper Hooksett Pool. This suggests that factors other than potential thermal effects from the discharge of Merrimack Station, that would be limited to the Thermally-influenced portion of lower Hooksett Pool, have caused changes in the community structure of Hooksett Pool.

3.2.3.4 Length-Weight Relationships

The length-weight relationships for four abundant species (bluegill and three RIS largemouth bass, smallmouth bass and yellow perch) are presented numerically in Table 3-14 and graphically in Figures 3-11 through 3-14. The magnitude of the slope in the regression equation reflects the condition or robustness of the fish; a higher slope indicates a greater weight relative to a constant increase in length. Since juveniles usually have a lower length-weight slope than older individuals, variation in the length-weight slope may also result from changes in the age composition of the samples.

Yellow perch (Figure 3-11) and largemouth bass (Figure 3-12) did not show any significant differences among slopes and y-intercepts between the three years (two decades) of sampling. For smallmouth bass, the slopes and y-intercepts were significantly different between 1995 and 2005, and between 2004 and 2005, but not between 1995 and 2004 (Figure 3-13; Table 3-14). These significant differences in y-intercepts indicate that smallmouth bass sampled by electrofishing during 2005 were more robust (heavier for a given length) than those sampled during 1995 or 2004. Bluegill slope and y-intercept values varied significantly during all three years of sampling (Figure 3-14; Table 3-14). During 2004, bluegill were more robust than those sampled during either 1995 or 2005. Bluegill sampled during 1995 were the least robust. During 1995, the population of bluegill was rapidly expanding following its introduction into Hooksett Pool in the previous decade (Scarola 1987), with large numbers of juveniles sampled throughout Hooksett Pool. The lower length-weight slopes associated with juvenile fish may have influenced the overall condition (slope) value for bluegill, resulting in a lower robustness relative to 2004 and 2005 when the bluegill population was relatively stable in terms of abundance.

The comparison of length-weight data for the above four species suggests that the average body condition for yellow perch and largemouth bass has remained constant from 1995 to present and that of smallmouth bass and bluegill has increased from 1995 to present. This suggests that the conditions for growth of these four numerically important Hooksett Pool species have maintained or improved over the ten year period (1995-2005). One possible reason for this improvement is the increase in abundance of spottail shiner, an important forage species. Unfortunately, the lack of length and weight data from the 1970's prevented those years from being included in this analysis. However, the stability or increase in condition observed for yellow perch, largemouth bass, smallmouth bass, and bluegill from 1995 to 2004-2005 supports a finding of "no prior appreciable harm" to the fish community of Hooksett Pool over the last ten years from Merrimack Station's thermal discharge.

3.2.3.5 Species Guild Biomass

Table 3-15 presents the fish species captured in Hooksett Pool during the 1995, 2004 and 2005 sampling efforts. Trophic guilds were assigned to each species based on life history characteristics: filter feeder, generalist, herbivore, insectivore, omnivore and piscivores (Barbour et al. 1999).

Due to low sample sizes, species classified as filter feeders (alewife) and herbivores (eastern silvery minnow) were not included in the ANCOVA analysis. Generalist species in Hooksett Pool during the three sampling years included fallfish and creek chub. There was significantly more biomass present in Hooksett Pool for generalist species in 1995 than in 2004 (ANCOVA, $p = 0.0032$) whereas there were no such significant differences between 1995 and 2005 or 2004 and 2005 (ANCOVA, $p>0.05$). Bluegill, pumpkinseed, bullhead, and yellow perch were among the eleven species classified as insectivores in Hooksett Pool. There were no significant differences detected in the biomass present during any of the three sampling years for insectivore species (ANCOVA, $p>0.05$). Biomass of omnivorous species within Hooksett Pool (common carp, golden shiner and white sucker) was greater in 2004 (ANCOVA, $p <0.0001$) and 2005 (ANCOVA, $p <0.0001$) than in 1995. There were no significant differences in the biomass present in 2004 as compared to 2005 (ANCOVA, $p = 0.0994$) for omnivorous species. American eel, smallmouth and largemouth bass, and rock bass were dominant among the nine species classified as piscivorous in Hooksett Pool that increased in 2004 (ANCOVA, $p = 0.0003$) and 2005 (ANCOVA, $p = 0.0449$) than in 1995. There were no significant differences in the biomass present in 2004 as compared to 2005 (ANCOVA, $p = 0.1098$) for piscivorous species. The overall analysis of species guild biomass reveals stablility in the insectivore guild over the past decade, and a reduction in the generalist guild that was offset by increases in the omnivorous and piscivorous guilds. These changes most likely reflect the contribution of recently introduced species (i.e. rock bass and black crappie) to the trophic dynamics within Hooksett Pool and the resulting rebalancing of trophic guilds to accommodate these introductions, and not any effect of Merrimack Station's thermal discharge, supporting a finding of no prior appreciable harm to the balanced indigenous populations found in Hooksett Pool during the evaluation period.

3.3 RESULTS OF TRAPNETTING TRENDS ANALYSIS

3.3.1 General Catch Characteristics

Table 3-16 shows the trapnet fish species catch during May through September (five months) of the five years with consistent and documented sampling effort (1974, 1975, 1976, 2004 and 2005). These available data provide two decades of sampling (the 1970's and the 2000's) separated by two decades without sampling (the 1980's and the 1990's), and are therefore not appropriate for trend analysis. The 1970's are represented by the 1974, 1975, and 1976 trapnet sampling efforts, and the 2000's are represented by the 2004 and 2005 trapnet sampling efforts. A total of 24 fish species were sampled in Hooksett Pool by trapnets during the five months consistently sampled by trapnets among the five years included in this analysis. Eighteen fish species were observed during the 1970's sampling effort, and seventeen fish species were observed during the 2000's sampling effort, with 6,201 individuals sampled during the 1970's and 521 individuals sampled during the 2000's. Eleven of the 24 fish species sampled were present during both decades. Seven fish species – brook trout, common shiner, golden shiner, largemouth bass, tadpole madtom, walleye, and white perch – were present in the 1970's trapnet catch but absent from the 2000's catch. Of those seven species, four were represented by only one individual in the 1970's Hooksett Pool catch. Six fish species that had not been present in the 1970's trapnet catch – black crappie, bluegill, eastern silvery minnow, rock bass, spottail shiner, and tessellated darter – were observed during the 2000's catch. Of those six species, only the tesselated darter (a small, fusiform bodied species) was represented by one individual in the 2000's trapnet catch.

During the 1970's, brown bullhead represented 37.6 and 34.9 %, respectively, of the total catch from upper and lower Hooksett Pool. White sucker (20.9%) and yellow perch (15%) were the second and third most abundant species within upper Hooksett Pool, while pumpkinseed (25.8%) and white sucker (16.4%) were the second and third most abundant species within lower Hooksett Pool. Brown bullhead (36%), pumpkinseed (25.8%) and white sucker (18.2%) represented 80% of the total catch for all of Hooksett Pool during the 1970's. During the 2000's, spottail shiner (36.5%), smallmouth bass (29.3%) and rock bass (13.3%) were the dominant species present within upper Hooksett Pool, while smallmouth bass (56.6%) accounted for over half of the fish captured by trapnet in lower Hooksett Pool. Smallmouth bass (42.8%), spottail shiner (18.4%) and rock bass (11.1%) were the three dominant species captured by trapnet in all of Hooksett Pool during the 2000's.

3.3.2 Catch per Unit Effort (CPUE)

Table 3-17 presents the CPUE (fish per 48-h set) for all species captured in upper and lower Hooksett Pool, and in all of Hooksett Pool, during May through September of all years with consistent and documented sampling effort (1974, 1975, 1976, 2004 and 2005). Trapnet CPUE was observed to be higher in the 1970's compared to the 2000's in upper Hooksett Pool (46.7 fish per 48-h in the 1970's vs.6.6 fish per 48-h in the 2000's), lower Hooksett Pool (74.0 fish per 48-h in the 1970's vs. 6.4 fish per 48-h in the 2000's), and throughout Hooksett Pool (60.2 fish per 48-h in the 1970's vs. 6.5 fish per 48-h in the 2000's). Based on a paired comparison using the upper and lower 95% confidence limits, trapnet CPUE values were significantly different between the two decades (1970's and 2000's) within Hooksett Pool. However, these differences were significant within both the lower Thermally-influenced zone and the upper Ambient zone, located upstream of the Station's thermal influence.

Similar to observed changes in species composition between the 1970's and 2000's, smallmouth bass had the highest observed CPUE values for Hooksett Pool during the 2000's, followed by spottail shiner and rock bass (Table 3-17). Spottail shiner and rock bass were both new species in the Hooksett Pool fish community that appeared during the 1980's or 1990's period that was not sampled by trapnet. Brown bullhead, pumpkinseed and white sucker had the three highest observed CPUE values during the 1970's. Both brown bullhead and white sucker were still present in the Hooksett Pool fish community sampled by trapnet during the 2000's. Pumpkinseed did not appear in the trapnet catch of the 2000's. Similar to the pattern observed in the electrofishing trends data, a community shift towards other anthropogenically introduced centrarchid species such as bluegill (4th highest observed CPUE in the 2000's), rock bass (3rd highest observed CPUE in the 2000's) and black crappie (5th highest observed CPUE in the 2000's) had a negative effect through resource competition on pumpkinseed abundance within Hooksett Pool.

3.3.3 Community Indices

Similar to the historical electrofishing data, the historical trapnet fisheries data were analyzed through three indices – taxa richness, rank abundance, and the Bray-Curtis Index – to evaluate changes in community trends. Trapnet fish species catch during May through September (five months) of the five years with consistent and documented sampling effort (1974, 1975, 1976, 2004 and 2005) were analyzed, providing two decades of sampling (the 1970's and the 2000's) separated by two decades without sampling (the 1980's and the 1990's).

Fish taxa richness, as sampled by trapnet, varied slightly within Hooksett Pool (Table 3-18), with eighteen species observed during the 1970's and seventeen species observed during the 2000's. Fish taxa richness during the 1970's is representative of three years of sampling effort. Taxa richness during the 2000's is representative of two years of sampling effort. As the probability of detection of less common species will increase as sampling effort is increased, it would be expected that the 1970's time period would have a greater taxa richness than that detected during the 2000's as the 1970's time period includes an additional five months of sampling (23 valid 48-h nets sets). The seven fish species that were absent from the 2000's trapnet catch but were observed in the trapnet catch from the 1970's were typically rare or in low abundance, and only one of those seven species (white perch) represented greater than 1% of the overall 1970's fish community sampled by trapnets. Four of those seven fish species captured only during the 1970's were represented by only one individual. Taxa richness within upper Hooksett Pool was similar between decades, with a total of sixteen fish species observed during each decade. Of the six fish species that were absent from the 2000's upper Hooksett Pool trapnet catch but were recorded during the 1970's, four were represented by less than 1% of the overall 1970's fish community. Taxa richness in lower Hooksett Pool was more varied, ranging from 15 species observed during the 1970's to 12 species observed during the 2000's. Of the seven species that were not represented in the 2000's lower Hooksett Pool trapnet catch but were recorded during the 1970's, five were represented by less than 1% of the overall 1970's fish community.

Comparison of the abundance rankings for fish caught by trapnets during the 1970's and 2000's revealed changes in relative abundances of fish captured by trapnet within Hooksett Pool. Table 3-19 presents the abundance rankings for fish species caught within Hooksett Pool during May through September of all years with consistent sampling effort (1974, 1975, 1976, 2004 and 2005). During the 1970's, brown bullhead were the first-ranked fish taxon captured by trapnet. They were followed by pumpkinseed, white sucker, yellow perch and smallmouth bass. During the 2000's, smallmouth bass were the species most frequently captured by trapnet, followed by spottail shiner and rock bass. Spottail shiner and rock bass were not sampled by trapnet during the 1970's. Redbreast sunfish and bluegill, another species absent from the 1970's trapnet catch, were the fourth and fifth most abundant species in the 2000's trapnet catch. Brown bullhead, the most abundant species during the 1970's, was the thirteenth most abundant during the 2000's, and pumpkinseed, the second most abundant species during the 1970's dropped to fifteenth place during the 2000's. White sucker and yellow perch also decreased in the rank abundance, from third in the 1970's to eighth in the 2000's, and fourth in the 1970's to sixth in the 2000's, respectively. Within upper Hooksett Pool, brown bullhead, white sucker and yellow perch were the three most abundant species during the 1970's. During the 2000's, spottail shiner, smallmouth bass and rock bass were the three most abundant, while brown bullhead, white sucker and yellow perch decreased to thirteenth, sixth and fifth, respectively. Within lower Hooksett Pool in the 1970's, brown bullhead, pumpkinseed, and white sucker were the three most abundant species. During the 2000's, smallmouth bass, bluegill, and redbreast sunfish were the three most abundant, while brown bullhead, pumpkinseed and white sucker decreased to twelfth, eleventh and sixth, respectively.

Table 3-20 presents a "then and now" comparison of the fish community within Hooksett Pool during the 1970's trapnet sampling efforts and the 2000's trapnet sampling efforts, as computed by the Bray-

Curtis Percent Similarity Index. The fish communities from these two time periods show limited similarity. The fish community of Hooksett Pool during the 1970's is 23.2% similar to the current community. Fish communities within upper Hooksett Pool (21.7%) and lower Hooksett Pool (24.4%) also show differences between what was present in the 1970's and what currently resides there.

Despite the low community similarities, the analysis of the Bray-Curtis Similarity Index supports a finding of "no prior appreciable harm" from the Station's thermal discharge to the fish community of Hooksett Pool as sampled by trapnet. Percent similarities between the fish community sampled during the 2000's are slightly greater for lower Hooksett Pool than that found in upper Hooksett Pool. This suggests that factors other than potential thermal effects from the discharge of Merrimack Station (which would be limited to lower Hooksett Pool) have caused changes in the community structure of Hooksett Pool. Similar to patterns observed during the electrofish sampling, changes to the overall Hooksett Pool fish community as sampled by trapnet are best explained by the anthropogenic introduction of three centrarchid species, particularly the bluegill, and unrelated to Merrimack Station's thermal discharge. The three introduced centrarchid species comprised 20% of the fish captured by trapnet during the 2000's and comprised 0% during the 1970's.

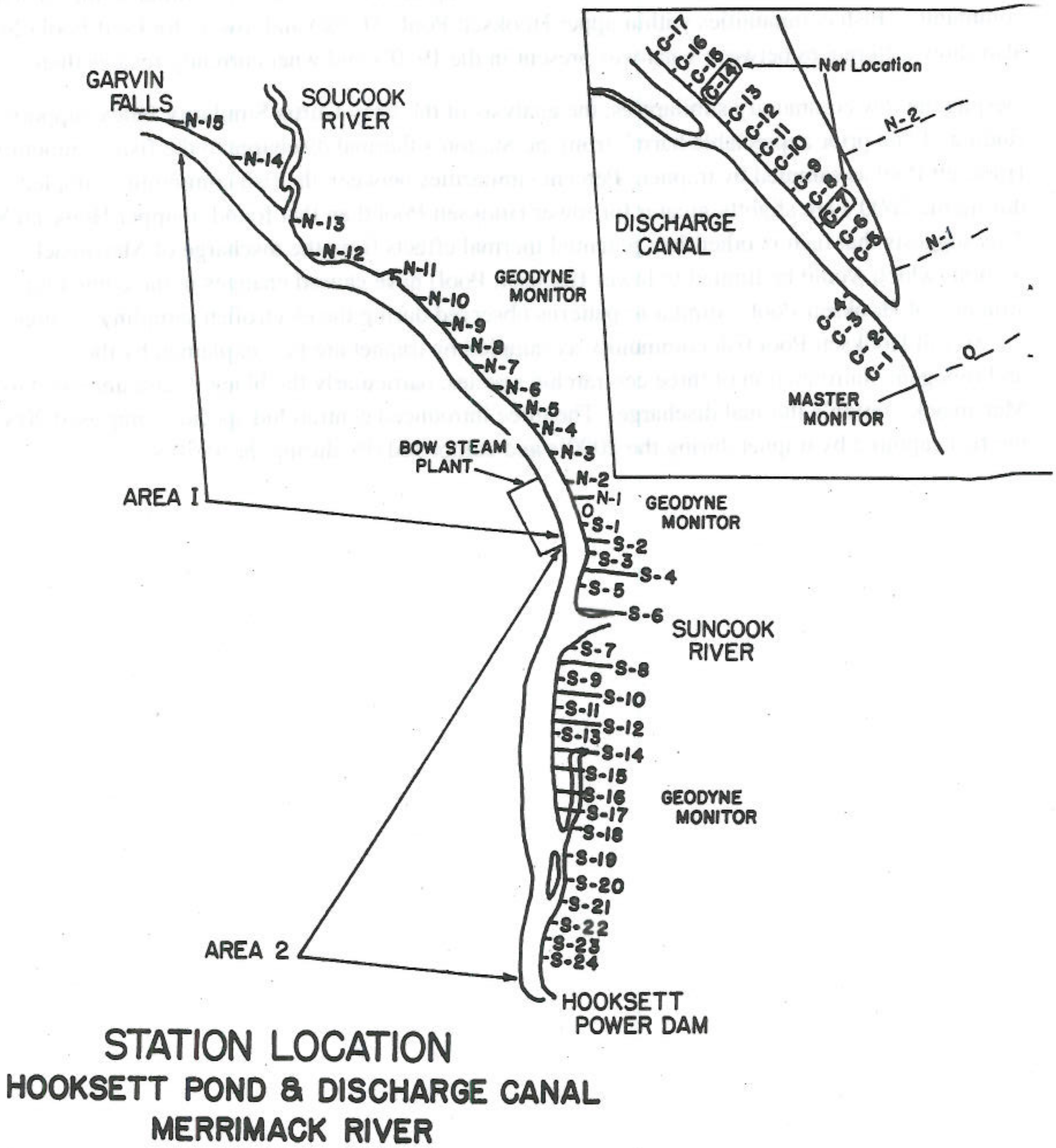


Figure 3-1. Monitoring Station location for 1967-1969 electrofish and trapnet sampling for Hooksett Pool as presented in Wightman (1971).

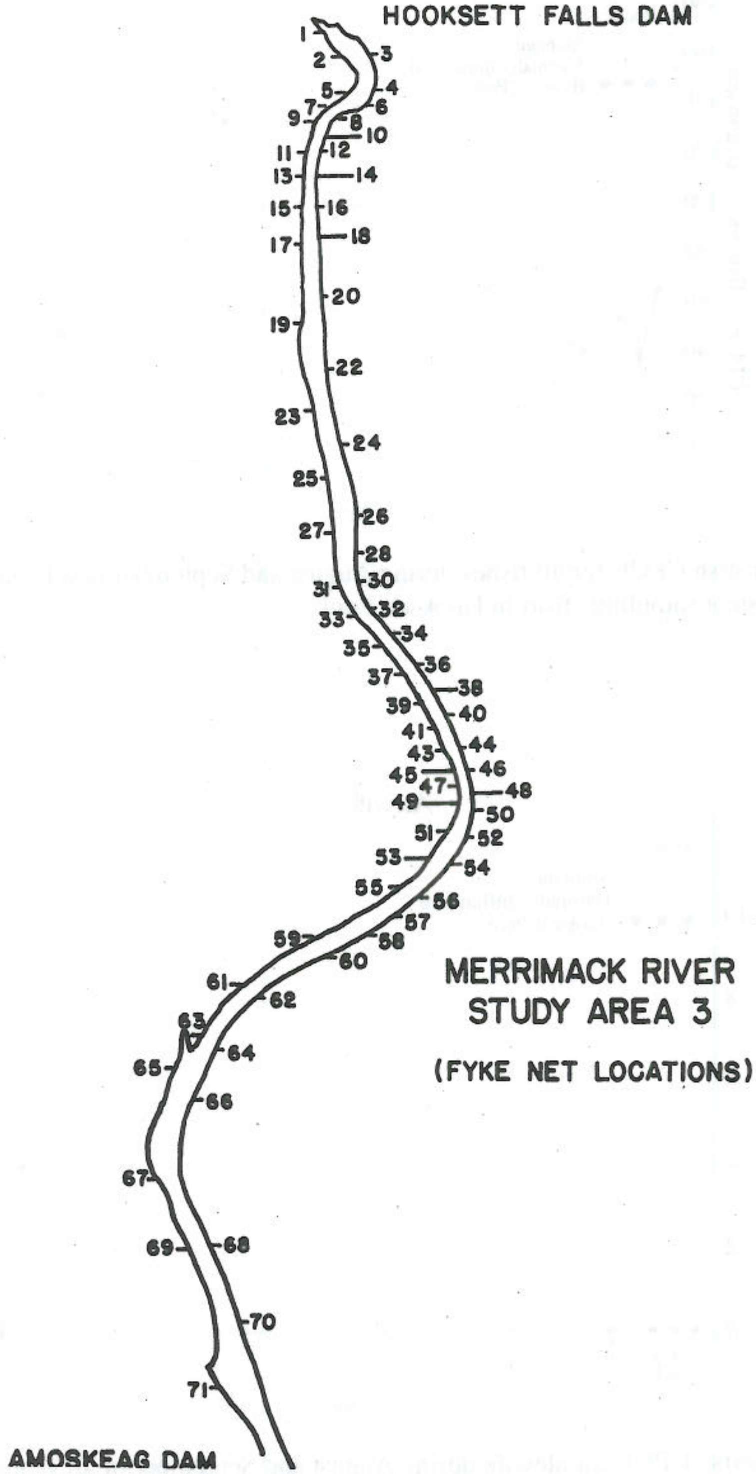


Figure 3-2. Monitoring Station location for 1967-1969 electrofish and trapnet sampling for Amoskeag Pool as presented in Wightman (1971).

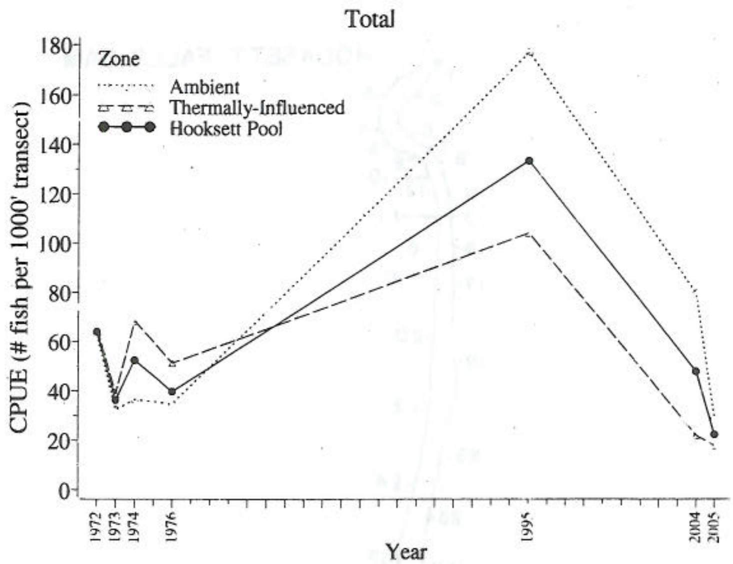


Figure 3-3. Electrofish CPUE for all fishes during August and September of all years with consistent sampling effort in Hooksett Pool.

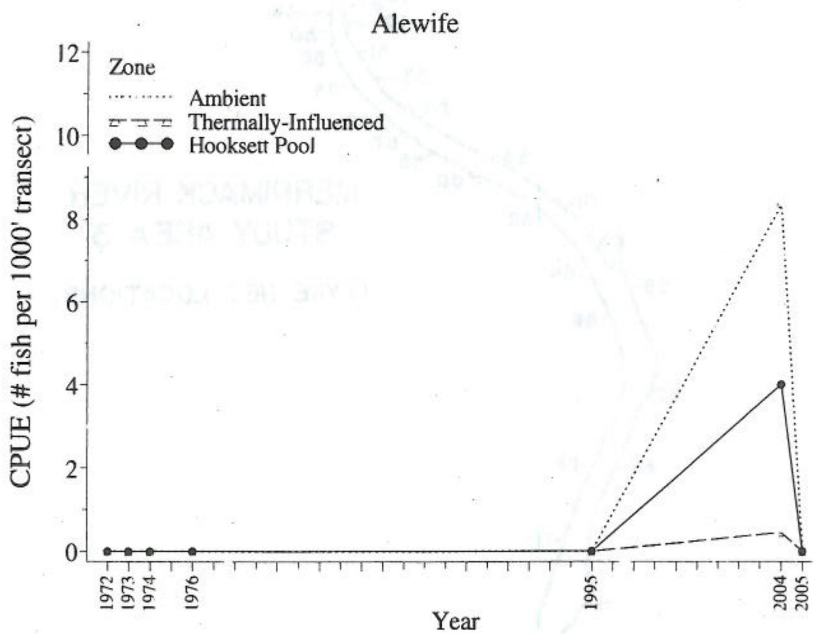


Figure 3-4. Electrofish CPUE for alewife during August and September of all years with consistent sampling effort in Hooksett Pool.

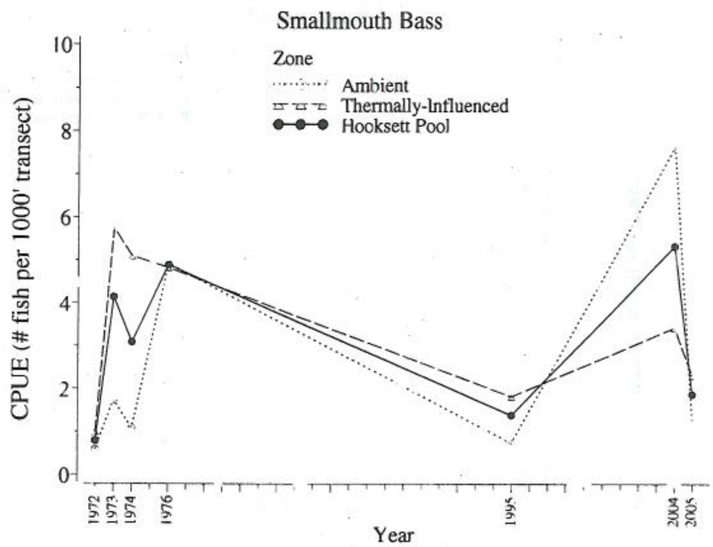


Figure 3-5. Electrofish CPUE for smallmouth bass during August and September of all years with consistent sampling effort in Hooksett Pool.

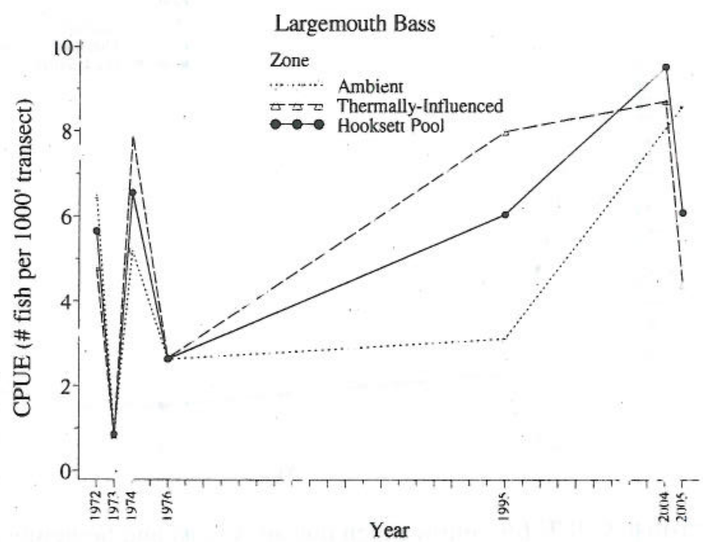


Figure 3-6. Electrofish CPUE for largemouth bass during August and September of all years with consistent sampling effort in Hooksett Pool.

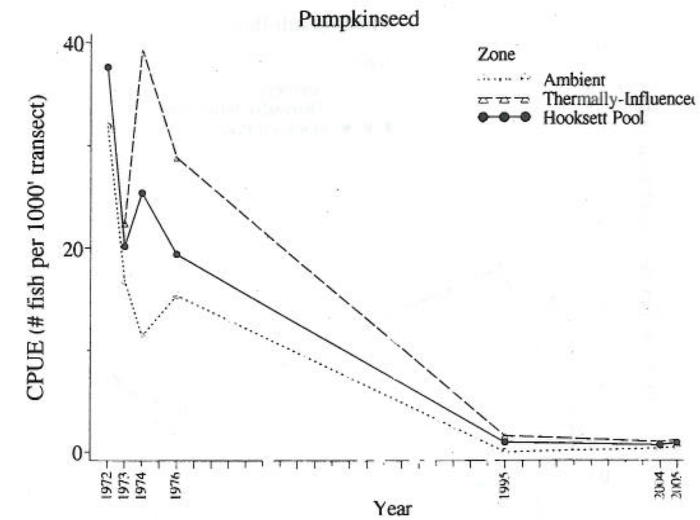


Figure 3-7. Electrofish CPUE for pumpkinseed during August and September of all years with consistent sampling effort in Hooksett Pool.

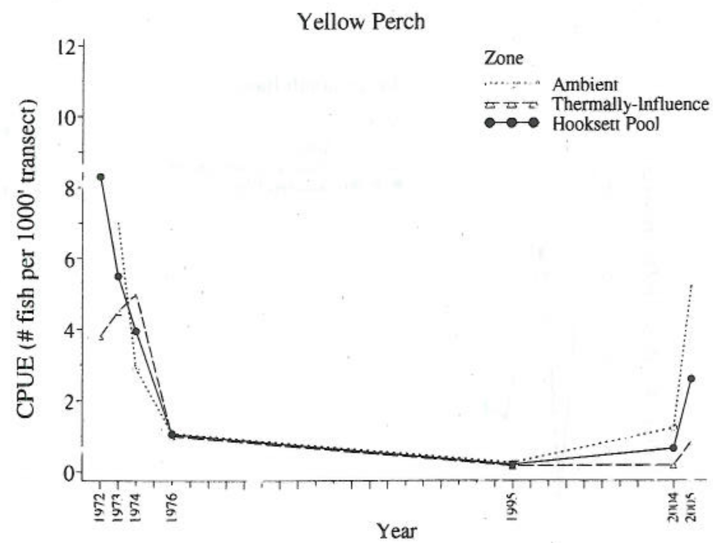


Figure 3-8. Electrofish CPUE for yellow perch during August and September of all years with consistent sampling effort in Hooksett Pool.

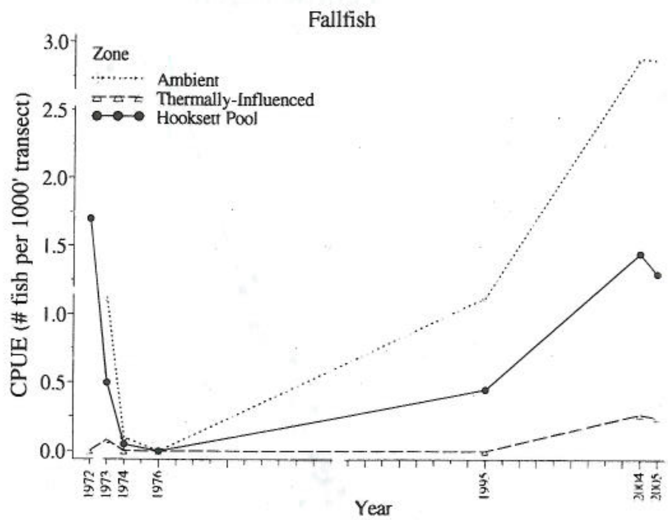


Figure 3-9. Electrofish CPUE for fallfish during August and September of all years with consistent sampling effort in Hooksett Pool.

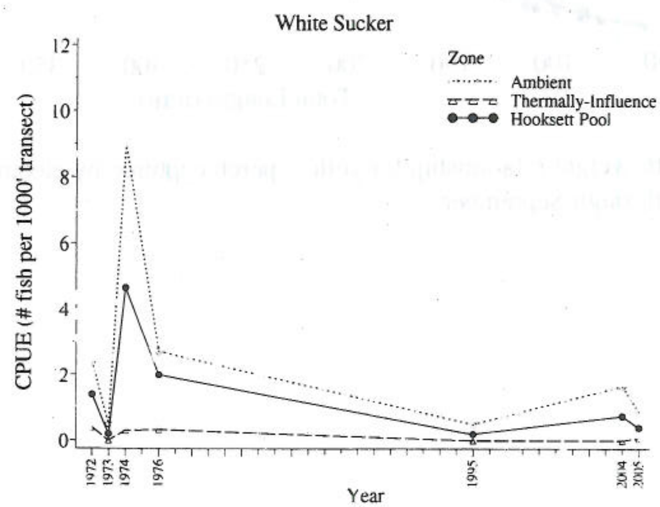


Figure 3-10. Electrofish CPUE for white sucker during August and September of all years with consistent sampling effort in Hooksett Pool.

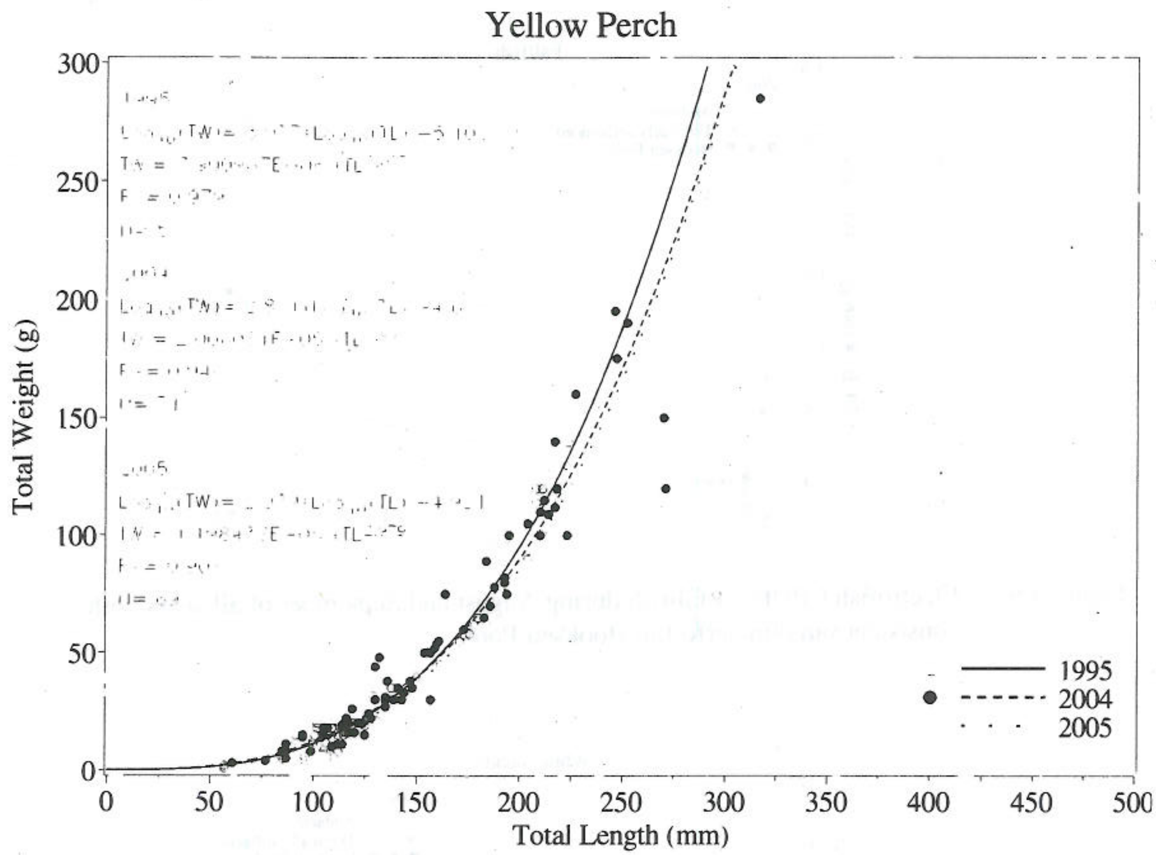


Figure 3-11. Length-weight relationship for yellow perch captured by electrofishing during May through September.

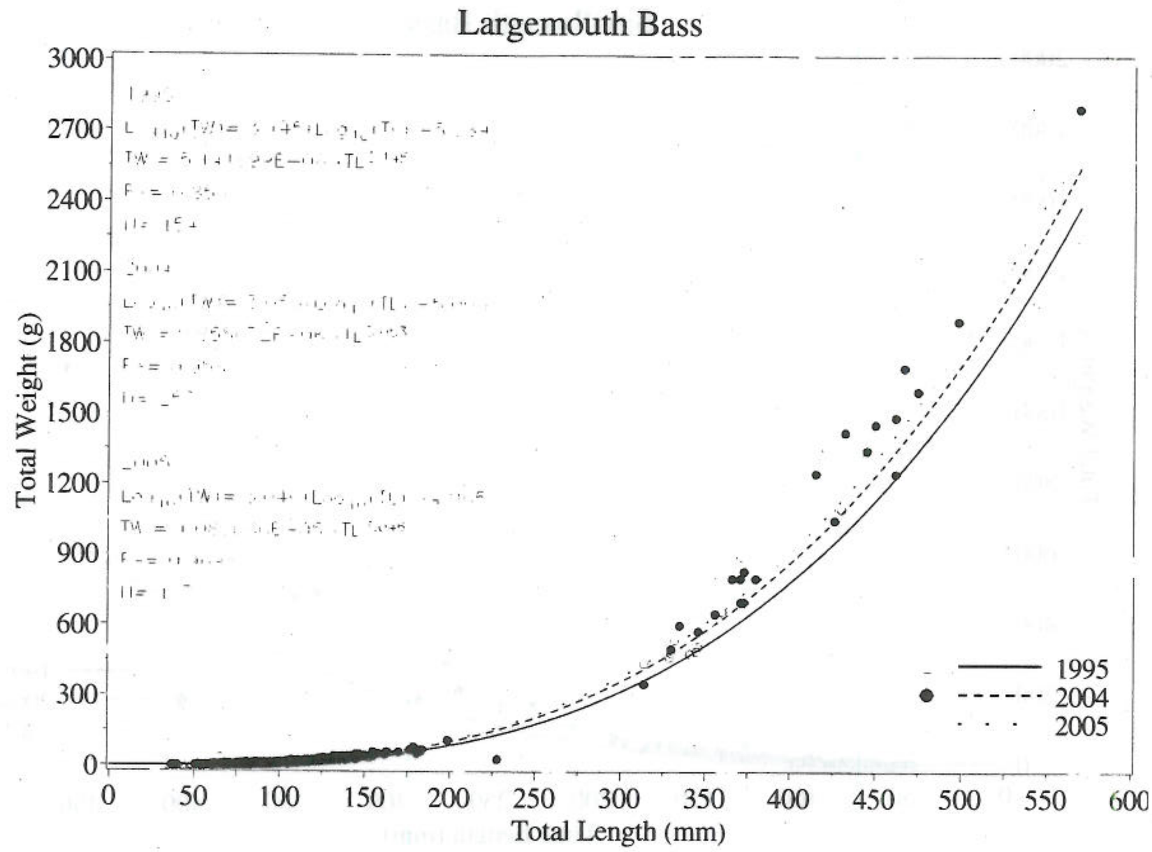


Figure 3-12. Length-weight relationship for largemouth bass captured by electrofishing during May through September of selected years

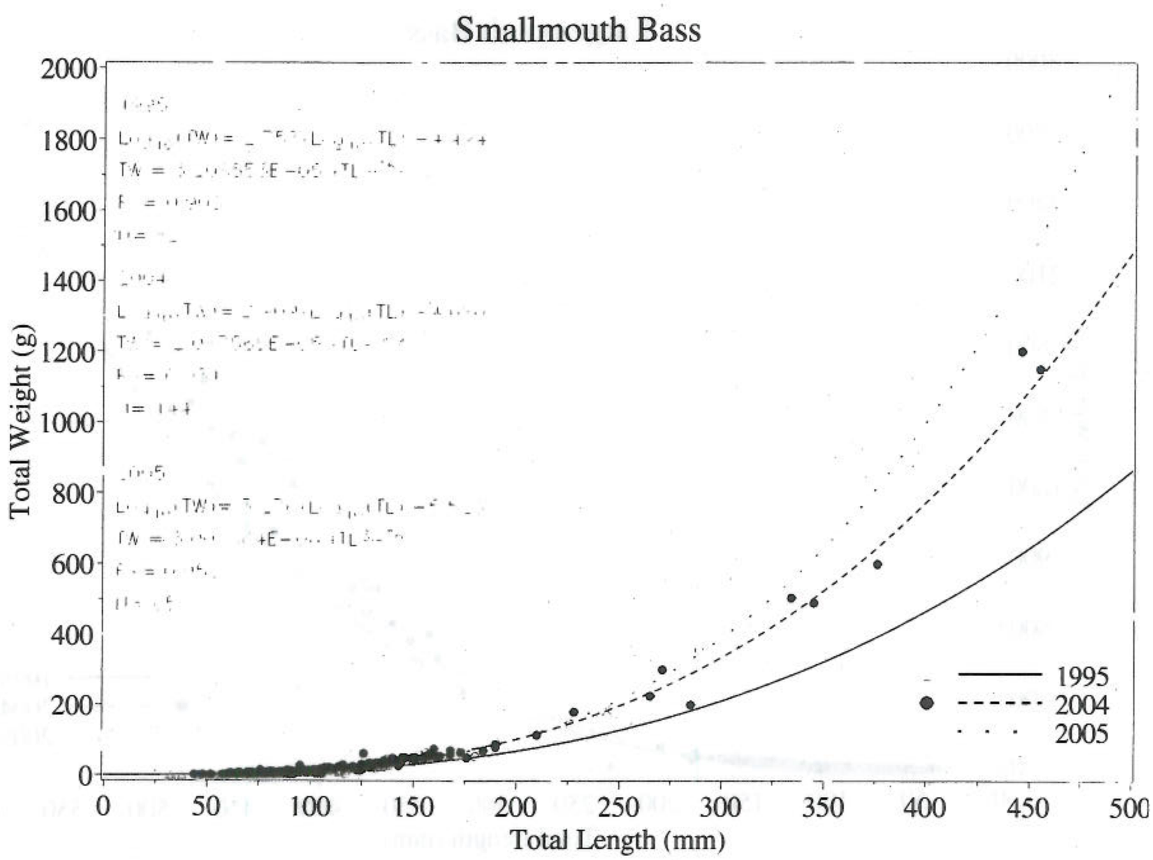


Figure 3-13. Length-weight relationship for smallmouth bass captured by electrofishing during May through September.

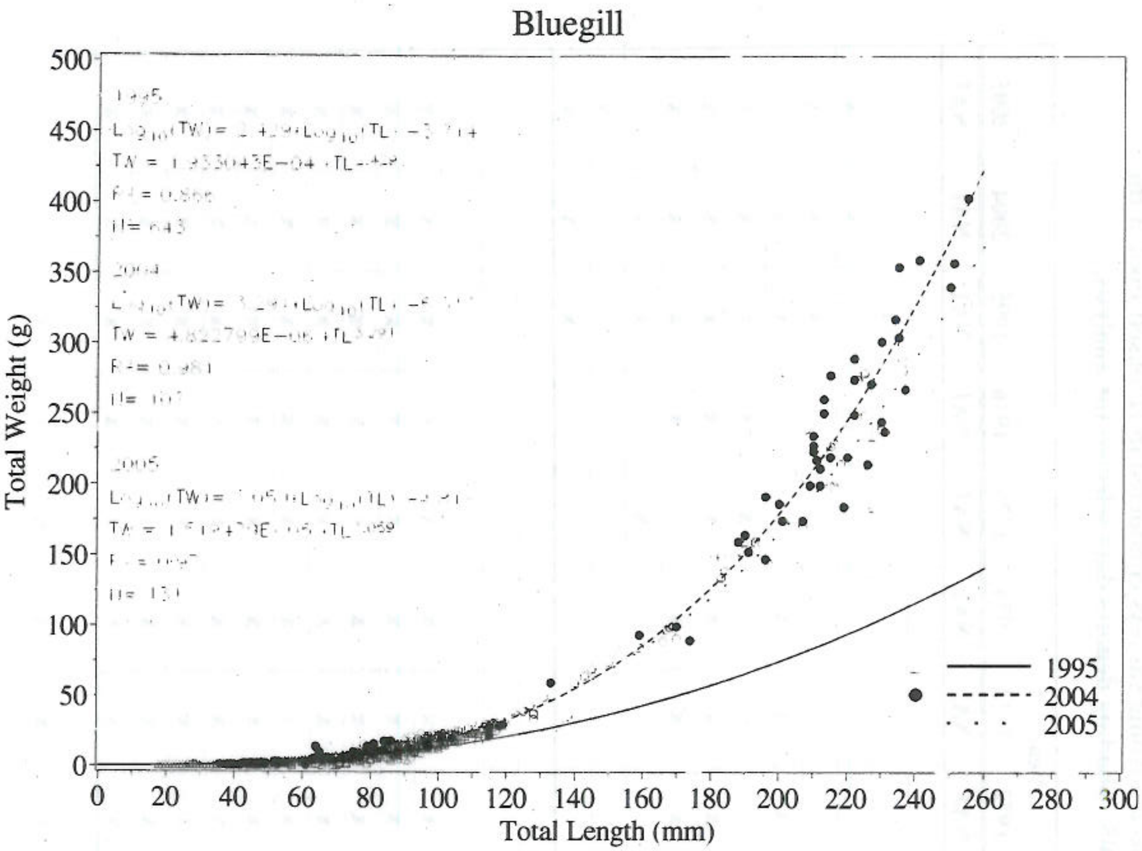


Figure 3-14. Length-weight relationship for bluegill captured by electrofishing during May through September.

Table 3-1. Sampling design comparison of the Merrimack Station electrofishing surveys conducted in Hooksett Pool of the Merrimack River near Bow, NH during 1967 through 2005. Shading denotes data selected for analysis.

		Year										
		1967	1968	1969	1972	1973	1974	1975	1976	1995	2004	2005
Source		NH F&G	NH F&G	NH F&G	NAI[1]	NAI	NAI	NAI	NAI	NAI	NAI	NAI
Month	Unknown											
	March									x		
	April										x	x
	May									x	x	x
	June				x	x	x			x	x	x
	July							x	x	x	x	x
	August				x	x	x	x	x	x	x	x
	September	x	x	x	x	x	x		x	x	x	x
	October							x		x	x	
	November											x
	December									x	x	x
Monitoring Station	North	x	x	x								
	South	x	x	x								
	N9-N10 E				x	x	x	x	x	x	x	x
	N9-N10 W				x	x	x	x	x	x	x	x
	N6-N7 E				x	x	x	x	x	x	x	x
	N6-N7 W				x	x	x	x	x	x	x	x
	Zero-S1 E				x	x	x	x	x	x	x	x
	Zero-S1 W				x	x	x	x	x	x	x	x
	S4-S5 E				x	x	x	x	x	x	x	x
	S4-S5 W				x	x	x	x	x	x	x	x
	S17-S18 E				x	x	x	x	x	x	x	x
	S17-S18 W				x	x	x	x	x	x	x	x
Transect Length	1,000				x	x	x	x	x	x	x	x
	Unknown	x	x	x								

[1] Normandeau Associates. Inc.

Table 3-2. Sampling design comparison of the Merrimack Station trapnet surveys conducted in Hooksett Pool of the Merrimack River near Bow, NH during 1967 through 2005. Shading denotes data selected for analysis.

		Year											
		1967	1968	1969	1972	1973	1974	1975	1976	1978	1995	2004	2005
Source		NH F&G	NH F&G	NH F&G	NAI[1]	NAI	NAI	NAI	NAI	NAI	NAI	NAI	NAI
Month	March										x		
	April											x	
	May						x	x	x	x	x	x	x
	June	x	x	x		x	x	x	x	x	x	x	x
	July	x	x	x		x	x	x	x	x	x	x	x
	August				x	x	x	x	x	x	x	x	x
	September				x	x	x	x	x	x	x	x	x
	October				x	x	x	x	x	x	x	x	
	November												
	December										x	x	
Months/Year		2	2	2	3	5	6	6	6	6	8	8	5
Monitoring Station	North	x	x	x									
	South	x	x	x									
	N10-W				x	x	x	x	x	x	x	x	x
	N10-E				x	x	x	x	x	x	x	x	x
	S2-W				x	x	x	x	x	x[2]	x	x	x
	S3-E				x	x	x	x	x	x	x	x	x
	S4-W									x[2]			
	DS-Canal										x	x	x
	US-Canal										x	x	x
Monitoring Stations/Month					4	4	4	4	4	4	6	6	6
Mesh	3/4"	?	?	?	x	x	x	x	x	x		x	x
	2"										x		
Field Sample Duration	Unknown	x	x	x									
	48 Hour Set				x	x	x	x	x	x	x	x	x
	24 Hour Set												
Available Data Format	Annual Report	x	x	x	x	x	x	x	x	x	x	x	x
	Field Sheets				Partial[3]	Partial[3]	x	x	x	x	x	x	x
Field Sample Frequency	2/month				x	x	x	x	x	x	x	x	x
	Unknown	x	x	x									

[1] Normandeau Associates. Inc.

[2] Discrepancy between 1978 report and field data sheet as to what Monitoring Stations were sampled.

[3] Incomplete record from field data sheets.

Table 3-3. Differences between previously reported values and those from the field data sheets, sorted by species, Monitoring Station and month.

Annual Report Year	Species	Monitoring Station	Month	Reported Value	Field Sheet Value
1974	pumpkinseed	N-10E	October	13	0
1974	pumpkinseed	S-2W	October	58	10
1974	white perch	S-2W	September	66	65
1974	pumpkinseed	S-3E	August	8	17
1974	pumpkinseed	S-3E	October	29	18
1974	redbreast sunfish	S-3E	August	10	1
1974	redbreast sunfish	S-3E	September	2	4
1975	golden shiner	N-10E	October	2	1
1975	smallmouth bass	N-10E	June	2	3
1976	white sucker	N-10E	June	2	3
1976	yellow perch	N-10E	May	2	1
1976	brown bullhead	N-10W	May	2	13
1976	pumpkinseed	N-10W	September	6	5
1976	redbreast sunfish	N-10W	August	4	5
1976	redbreast sunfish	N-10W	September	6	5
1976	smallmouth bass	N-10W	July	3	2
1976	smallmouth bass	N-10W	September	3	1
1976	white perch	N-10W	August	3	2
1976	white perch	N-10W	September	7	5
1976	white sucker	N-10W	September	7	5
1976	yellow bullhead	N-10W	May	1	2
1976	yellow perch	N-10W	May	121	120
1976	brown bullhead	S-2W	July	40	145
1976	brown bullhead	S-2W	June	402	603
1976	brown bullhead	S-2W	May	1	2
1976	pumpkinseed	S-2W	July	105	134
1976	redbreast sunfish	S-2W	September	1	0
1976	yellow perch	S-2W	June	20	21
1976	brown bullhead	S-3E	June	12	11
1976	pumpkinseed	S-3E	August	1	0
1976	pumpkinseed	S-3E	September	13	1
1976	redbreast sunfish	S-3E	September	4	1
1976	white perch	S-3E	September	2	1
1976	white sucker	S-3E	September	6	4

Table 3-4. Results of post-hoc stratification to classify Merrimack River electrofishing samples from the interannual trends period of 1972 through 2005 into ambient or thermally influenced conditions at time of sampling. Shading denotes dates and Monitoring Stations that represent ambient conditions in upper Hooksett Pool, and unshaded cells represent dates and Monitoring Stations within the Thermally-influenced portion of Lower Hooksett Pool. Water temperature values are presented in °C.

Month/Year	11E	11W	12E	12W	13E	13W	14E	14W	15E	15W
Aug-72	24.2	24.1	24.0	24.0	27.8	25.0	25.6	26.7	22.8	22.8
Sep-72	19.2	19.2	18.9	19.2	25.9	25.6	24.7	24.2	21.7	22.6
Aug-73	25.8	25.5	25.8	25.1	31.9	31.9	26.3	27.6	26.1	26.6
Sep-73	19.3	19.1	19.5	19.2	24.8	24.1	24.7	24.5	20.9	23.3
Aug-74	24.9	25.0	25.1	25.6	29.1	26.3	25.7	25.7	25.0	25.6
Sep-74	21.3	21.3	21.1	21.1	26.7	22.9	22.7	26.7	21.9	23.3
Aug-76	n/a	21.7	21.0	22.0	21.6	25.6	21.3	21.2	21.7	21.2
Sep-76	19.0	18.2	19.9	18.0	22.4	22.6	18.1	22.7	n/a	n/a
Aug-95	24.8	24.1	24.6	24.2	31.3	29.4	29.7	29.9	26.5	27.7
Sep-95	18.3	17.8	18.1	17.5	25.8	25.2	24.5	24.8	20.1	21.1
Aug-04	24.3	24.3	24.5	24.6	31.6	30.1	25.8	30.7	27.3	26.0
Sep-04	18.1	18.2	18.3	18.1	23.8	19.1	20.1	18.7	18.0	18.5
Aug-05	24.6	24.5	23.9	24.4	32.3	30.5	29.5	29.8	27.0	27.4
Sep-05	18.5	18.5	19.1	18.7	27.5	23.7	23.9	21.8	22.0	22.7

Table 3-5. Species captured by electrofishing during August and September of select years in Hooksett Pool the Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling) and total Hooksett Pool (Monitoring Stations 11-15).

Species	1972			1973			1974			1976			1995			2004			2005		
	Ambient	Thermally-influenced	Total	Ambient	Thermally-influenced	Total	Ambient	Thermally-influenced	Total	Ambient	Thermally-influenced	Total	Ambient	Thermally-influenced	Total	Ambient	Thermally-influenced	Total	Ambient	Thermally-influenced	Total
Alewife																	X	X			
American Eel	X	X	X	X	X	X	X	X	X	X	X	X					X	X		X	X
Black Crappie																	X	X			X
Bluegill													X	X	X		X	X		X	X
Brown Bullhead	X	X	X	X	X	X	X	X	X	X	X	X									
Chain Pickerel	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X	X
Common Shiner								X	X				X	X	X			X			
Eastern Silvery Minnow																		X			
Fallfish	X		X	X	X	X	X		X				X		X		X	X		X	X
Golden Shiner	X	X	X	X	X	X	X	X	X					X	X			X		X	X
Largemouth Bass	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
Margined Madtom										X	X	X									
Pumpkinseed	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X		X	X
Redbreast Sunfish	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
Rock Bass													X	X	X			X			X
Smallmouth Bass	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
Spottail Shiner							X		X				X		X			X			X
Tesellated Darter							X	X	X	X	X	X	X	X	X		X	X			
White Perch					X	X															
White Sucker	X	X	X	X		X	X	X	X	X	X	X	X		X			X		X	X
Yellow Bullhead	X		X		X	X	X		X	X	X	X									
Yellow Perch	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
Total # Observed	12	10	12	11	12	13	14	12	15	12	12	12	11	11	14	17	12	18	14	11	14

Table 3-6. Total catch (N) and relative abundance (%) of fishes caught by electrofishing in Hooksett pool, Merrimack River during August and September.

Common Name	Year													
	1972		1973		1974		1976		1995		2004		2005	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Alewife	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	80	8.4	0	0.0
American Eel	17	1.3	16	2.2	21	2.0	9	1.1	0	0.0	4	0.4	3	0.7
Atlantic Salmon	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
American Shad	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Black Crappie	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1	2	0.4
Bluegill	0	0.0	0	0.0	0	0.0	0	0.0	1111	41.7	64	6.7	112	25.1
Brown Bullhead	43	3.4	11	1.5	12	1.1	4	0.5	0	0.0	0	0.0	0	0.0
Brown Trout	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chain Pickerel	13	1.0	6	0.8	8	0.8	4	0.5	2	0.1	3	0.3	3	0.7
Common Shiner	0	0.0	0	0.0	2	0.2	0	0.0	70	2.6	62	6.5	0	0.0
Eastern Silvery Minnow	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	14	1.5	0	0.0
Fallfish	34	2.7	10	1.4	1	0.1	0	0.0	9	0.3	29	3.0	26	5.8
Golden Shiner	6	0.5	5	0.7	9	0.9	0	0.0	4	0.2	27	2.8	8	1.8
Largemouth Bass	113	8.8	17	2.3	131	12.5	53	6.7	121	4.5	191	20.0	122	27.4
Margined Madtom	0	0.0	0	0.0	0	0.0	4	0.5	0	0.0	0	0.0	0	0.0
Pumpkinseed	753	58.8	404	55.7	508	48.4	389	48.9	19	0.7	14	1.5	18	4.0
Redbreast Sunfish	90	7.0	56	7.7	110	10.5	160	20.1	118	4.4	53	5.5	37	8.3
Rock Bass	0	0.0	0	0.0	0	0.0	0	0.0	10	0.4	4	0.4	1	0.2
Smallmouth Bass	16	1.2	83	11.4	62	5.9	98	12.3	28	1.1	107	11.2	38	8.5
Spottail Shiner	0	0.0	0	0.0	6	0.6	0	0.0	1161	43.6	271	28.3	16	3.6
Tessellated Darter	0	0.0	0	0.0	3	0.3	4	0.5	2	0.1	4	0.4	0	0.0
White Perch	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
White Sucker	28	2.2	4	0.6	93	8.9	40	5.0	4	0.2	15	1.6	8	1.8
Yellow Bullhead	2	0.2	2	0.3	4	0.4	9	1.1	0	0.0	0	0.0	0	0.0
Yellow Perch	166	13.0	110	15.2	79	7.5	21	2.6	4	0.2	13	1.4	52	11.7
Total	**1281**	**100.0**	**725**	**100.0**	**1049**	**100.0**	**795**	**100.0**	**2663**	**100.0**	**956**	**100.0**	**446**	**100.0**

Table 3-7. Mean CPUE (fish per 1,000 ft transect) of selected species caught by electrofishing in the Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling) and total Hooksett Pool (Monitoring Stations 11-15).during August and September.

Common Name		Year 1972	1973	1974	1976	1995	2004	2005
Ambient Zone	Alewife	0.00	0.00	0.00	0.00	0.00	8.33	0.00
	American Eel	0.60	1.38	0.90	0.43	0.00	0.33	0.25
	Atlantic Salmon	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Black Crappie	0.00	0.00	0.00	0.00	0.00	0.00	0.25
	Bluegill	0.00	0.00	0.00	0.00	16.13	2.67	4.38
	Brown Bullhead	1.80	0.75	0.60	0.07	0.00	0.00	0.00
	Brown Trout	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Centrarchids	0.00	0.00	0.00	0.00	16.38	3.11	4.75
	Chain Pickerel	0.80	0.25	0.70	0.14	0.00	0.22	0.13
	Common Carp	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Common Shiner	0.00	0.00	0.00	0.00	8.63	6.89	0.00
	Creek Chub	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Eastern Silvery Minnow	0.00	0.00	0.00	0.00	0.00	1.56	0.00
	Emerald Shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fallfish	3.40	1.13	0.10	0.00	1.13	2.89	2.88
	Golden Shiner	0.10	0.13	0.80	0.00	0.00	3.00	0.50
	Largemouth Bass	6.50	0.88	5.20	2.64	3.13	10.56	8.63
	Margined Madtom	0.00	0.00	0.00	0.14	0.00	0.00	0.00
	Pumpkinseed	31.90	16.88	11.40	15.43	0.00	0.33	0.50
	Rainbow Trout	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Redbreast Sunfish	1.70	1.63	2.60	6.57	0.88	1.11	1.88
	Rock Bass	0.00	0.00	0.00	0.00	0.25	0.44	0.13
	Smallmouth Bass	0.60	1.75	1.10	4.93	0.75	7.67	1.25
	Spottail Shiner	0.00	0.00	0.60	0.00	145.1	30.11	2.00
	Tadpole Madtom	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Tessellated Darter	0.00	0.00	0.20	0.21	0.13	0.33	0.00
	White Perch	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	White Sucker	2.40	0.50	9.00	2.71	0.50	1.67	0.88
	Yellow Bullhead	0.20	0.00	0.40	0.43	0.00	0.00	0.00
	Yellow Perch	12.80	7.00	2.90	1.07	0.25	1.22	5.25
	Total	**62.80**	**32.25**	**36.50**	**34.79**	**176.9**	**79.33**	**28.88**

(continued)

Table 3-7. (Continued)

Common Name		1972	1973	1974	1976	1995	2004	2005
		Year						
Thermally-influenced Zone	Alewife	0.00	0.00	0.00	0.00	0.00	0.45	0.00
	American Eel	1.10	0.42	1.20	0.50	0.00	0.09	0.08
	Atlantic Salmon	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Black Crappie	0.00	0.00	0.00	0.00	0.00	0.09	0.00
	Bluegill	0.00	0.00	0.00	0.00	81.83	3.64	6.42
	Brown Bullhead	2.50	0.42	0.60	0.50	0.00	0.00	0.00
	Brown Trout	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Centrarchids	0.00	0.00	0.00	0.00	82.50	3.73	6.42
	Chain Pickerel	0.50	0.33	0.10	0.33	0.17	0.09	0.17
	Common Carp	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Common Shiner	0.00	0.00	0.20	0.00	0.08	0.00	0.00
	Creek Chub	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Eastern Silvery Minnow	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Emerald Shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fallfish	0.00	0.08	0.00	0.00	0.00	0.27	0.25
	Golden Shiner	0.50	0.33	0.10	0.00	0.33	0.00	0.33
	Largemouth Bass	4.80	0.83	7.90	2.67	8.00	8.73	4.42
	Margined Madtom	0.00	0.00	0.00	0.33	0.00	0.00	0.00
	Pumpkinseed	43.40	22.42	39.40	28.83	1.58	1.00	1.17
	Rainbow Trout	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Redbreast Sunfish	7.30	3.58	8.40	11.33	9.25	3.91	1.83
	Rock Bass	0.00	0.00	0.00	0.00	0.67	0.00	0.00
	Smallmouth Bass	1.00	5.75	5.10	4.83	1.83	3.45	2.33
	Spottail Shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Tadpole Madtom	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Tessellated Darter	0.00	0.00	0.10	0.17	0.08	0.09	0.00
	White Perch	0.00	0.08	0.00	0.00	0.00	0.00	0.00
	White Sucker	0.40	0.00	0.30	0.33	0.00	0.00	0.08
	Yellow Bullhead	0.00	0.17	0.00	0.50	0.00	0.00	0.00
	Yellow Perch	3.80	4.50	5.00	1.00	0.17	0.18	0.83
	Total	**65.30**	**38.92**	**68.40**	**51.33**	**104.0**	**22.00**	**17.92**

(continued)

Table 3-7. (Continued)

Common Name		Year						
		1972	1973	1974	1976	1995	2004	2005
Hooksett Pool	Alewife	0.00	0.00	0.00	0.00	0.00	4.00	0.00
	American Eel	0.85	0.80	1.05	0.45	0.00	0.20	0.15
	Atlantic Salmon	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Black Crappie	0.00	0.00	0.00	0.00	0.00	0.05	0.10
	Bluegill	0.00	0.00	0.00	0.00	55.55	3.20	5.60
	Brown Bullhead	2.15	0.55	0.60	0.20	0.00	0.00	0.00
	Brown Trout	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Centrarchids	0.00	0.00	0.00	0.00	56.05	3.45	5.75
	Chain Pickerel	0.65	0.30	0.40	0.20	0.10	0.15	0.15
	Common Carp	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Common Shiner	0.00	0.00	0.10	0.00	3.50	3.10	0.00
	Creek Chub	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Eastern Silvery Minnow	0.00	0.00	0.00	0.00	0.00	0.70	0.00
	Emerald Shiner	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fallfish	1.70	0.50	0.05	0.00	0.45	1.45	1.30
	Golden Shiner	0.30	0.25	0.45	0.00	0.20	1.35	0.40
	Largemouth Bass	5.65	0.85	6.55	2.65	6.05	9.55	6.10
	Margined Madtom	0.00	0.00	0.00	0.20	0.00	0.00	0.00
	Pumpkinseed	37.65	20.20	25.40	19.45	0.95	0.70	0.90
	Rainbow Trout	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Redbreast Sunfish	4.50	2.80	5.50	8.00	5.90	2.65	1.85
	Rock Bass	0.00	0.00	0.00	0.00	0.50	0.20	0.05
	Smallmouth Bass	0.80	4.15	3.10	4.90	1.40	5.35	1.90
	Spottail Shiner	0.00	0.00	0.30	0.00	58.05	13.55	0.80
	Tadpole Madtom	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Tessellated Darter	0.00	0.00	0.15	0.20	0.10	0.20	0.00
	White Perch	0.00	0.05	0.00	0.00	0.00	0.00	0.00
	White Sucker	1.40	0.20	4.65	2.00	0.20	0.75	0.40
	Yellow Bullhead	0.10	0.10	0.20	0.45	0.00	0.00	0.00
	Yellow Perch	8.30	5.50	3.95	1.05	0.20	0.65	2.60
	Total	**64.05**	**36.25**	**52.45**	**39.75**	**133.2**	**47.80**	**22.30**

Table 3-8. **Mann-Kendall results for detection of increasing or decreasing RIS trends within the Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling) and total Hooksett Pool (Monitoring Stations 11-15) for fish captured by electrofishing.**

RIS	Ambient Zone			Thermally-influenced Zone			Hooksett Pool		
	Kendall-Tau	p-value	Trend	Kendall-Tau	p-value	Trend	Kendall-Tau	p-value	Trend
Alewife	0.356	0.317	Stable	0.356	0.317	Stable	0.356	0.317	Stable
American shad	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Atlantic salmon	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Smallmouth bass	0.333	0.293	Stable	-0.238	0.453	Stable	0.238	0.453	Stable
Largemouth bass	0.333	0.293	Stable	0.333	0.293	Stable	0.429	0.177	Stable
Pumpkinseed	-0.619	0.051	Stable	-0.714	0.024	Decreasing	-0.810	0.011	Decreasing
Yellow perch	-0.429	0.177	Stable	-0.429	0.177	Stable	-0.619	0.051	Stable
Fallfish	0.000	1.000	Stable	0.394	0.241	Stable	-0.048	0.881	Stable
White Sucker	-0.195	0.543	Stable	-0.309	0.347	Stable	-0.195	0.543	Stable
Total Catch	**-0.048**	**0.881**	**Stable**	**-0.333**	**0.293**	**Stable**	**-0.238**	**0.453**	**Stable**

Table 3-9. Taxa richness (number) of fishes captured by electrofishing during August and September of all years in Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling) and total Hooksett Pool (Monitoring Stations 11-15).

Year	Zone		
	Ambient Zone	Thermally-influenced Zone	Hooksett Pool
1972	12	10	12
1973	11	12	13
1974	14	12	15
1976	12	12	12
1995	11	11	14
2004	17	12	18
2005	14	11	14

Table 3-10. Abundance ranking based on mean CPUE (fish per 1,000 ft transect) of fish species caught by electrofishing during August and September of all years in Hooksett pool (Monitoring Stations 11-15).

Common Name	Year						
	1972	1973	1974	1976	1995	2004	2005
Alewife						4.0	
American Eel	8.0	6.0	7.0	7.5		15.0	11.5
Black Crappie						18.0	13.0
Bluegill					2.0	5.0	2.0
Brown Bullhead	5.0	7.0	8.0	10.5			
Chain Pickerel	10.0	9.0	10.0	10.5	13.5	17.0	11.5
Common Shiner			14.0		5.0	6.0	
Eastern Silvery Minnow						11.5	
Fallfish	6.0	8.0	15.0		9.0	8.0	6.0
Golden Shiner	11.0	10.0	9.0		11.0	9.0	9.5
Largemouth Bass	3.0	5.0	2.0	4.0	3.0	2.0	1.0
Margined Madtom				10.5			
Pumpkinseed	1.0	1.0	1.0	1.0	7.0	11.5	7.0
Redbreast Sunfish	4.0	4.0	3.0	2.0	4.0	7.0	5.0
Rock Bass					8.0	15.0	14.0
Smallmouth Bass	9.0	3.0	6.0	3.0	6.0	3.0	4.0
Spottail Shiner			11.0		1.0	1.0	8.0
Tessellated Darter			13.0	10.5	13.5	15.0	
White Perch		13.0					
White Sucker	7.0	11.0	4.0	5.0	11.0	10.0	9.5
Yellow Bullhead	12.0	12.0	12.0	7.5			
Yellow Perch	2.0	2.0	5.0	6.0	11.0	13.0	3.0

Table 3-11. Abundance ranking based on mean CPUE (fish per 1,000 ft transect) of fish species caught by electrofishing during August and September of all years in the Ambient zone of Hooksett Pool.

Common Name	Year						
	1972	1973	1974	1976	1995	2004	2005
Alewife						3.0	
American Eel	9.5	5.0	7.0	7.5		15.0	11.5
Black Crappie							11.5
Bluegill					2.0	8.0	3.0
Brown Bullhead	6.0	8.0	10.5	12.0			
Chain Pickerel	8.0	10.0	9.0	10.5		17.0	13.5
Common Shiner					3.0	5.0	
Eastern Silvery Minnow						10.0	
Fallfish	4.0	6.0	14.0		5.0	7.0	4.0
Golden Shiner	12.0	11.0	8.0			6.0	9.5
Largemouth Bass	3.0	7.0	3.0	5.0	4.0	2.0	1.0
Margined Madtom				10.5			
Pumpkinseed	1.0	1.0	1.0	1.0		15.0	9.5
Redbreast Sunfish	7.0	4.0	5.0	2.0	6.0	12.0	6.0
Rock Bass					9.5	13.0	13.5
Smallmouth Bass	9.5	3.0	6.0	3.0	7.0	4.0	7.0
Spottail Shiner			10.5		1.0	1.0	5.0
Tessellated Darter			13.0	9.0	11.0	15.0	
White Sucker	5.0	9.0	2.0	4.0	8.0	9.0	8.0
Yellow Bullhead	11.0		12.0	7.5			
Yellow Perch	2.0	2.0	4.0	6.0	9.5	11.0	2.0

Table 3-12. Abundance ranking based on mean CPUE (fish per 1,000 ft transect) of fish species caught by electrofishing during August and September of all years in the Thermally-influenced zone of Hooksett Pool.

Common Name	Year						
	1972	1973	1974	1976	1995	2004	2005
Alewife						6.0	
American Eel	6.0	6.5	6.0	7.0		10.5	10.5
Black Crappie						10.5	
Bluegill					1.0	3.0	1.0
Brown Bullhead	5.0	6.5	7.0	7.0			
Chain Pickerel	8.5	8.5	11.0	10.0	8.5	10.5	9.0
Common Shiner			9.0		10.5		
Fallfish		11.5				7.0	8.0
Golden Shiner	8.5	8.5	11.0		7.0		7.0
Largemouth Bass	3.0	5.0	3.0	4.0	3.0	1.0	2.0
Margined Madtom				10.0			
Pumpkinseed	1.0	1.0	1.0	1.0	5.0	5.0	5.0
Redbreast Sunfish	2.0	4.0	2.0	2.0	2.0	2.0	4.0
Rock Bass					6.0		
Smallmouth Bass	7.0	2.0	4.0	3.0	4.0	4.0	3.0
Tessellated Darter			11.0	12.0	10.5	10.5	
White Perch		11.5					
White Sucker	10.0		8.0	10.0			10.5
Yellow Bullhead		10.0		7.0			
Yellow Perch	4.0	3.0	5.0	5.0	8.5	8.0	6.0

Table 3-13. Decadal (1970's, 1995, and 2000's) comparison of the Bray-Curtis Percent Similarity Index for the fish communities sampled by electrofishing during August and September of all years with consistent sampling effort within the Ambient and Thermally-influenced zones of Hooksett Pool (as determined by thermal regime at time of sampling) and total Hooksett Pool (Monitoring Stations 11-15).

Fish Communities Compared	Bray-Curtis Percent Similarity		
	Upper Hooksett Pool	Lower Hooksett Pool	Hooksett Pool
1970's vs. 1995	29.9	50.6	40.8
1970's vs.2000's	48.1	55.5	51.3
1995 vs. 2000's	61.1	71.3	66.6

Table 3-14. Regression statistics for total weight (g) vs. length (mm tl) of selected species from the Hooksett Pool of Merrimack River during 1995, 2004, and 2005.

Species	Year	N	Log_{10} Slope	Log_{10} Intercept	R^2	ANCOVA test for differences in length vs. weight equations[1]					
						Slope			Intercept		
						1995	2004	2005	1995	2004	2005
Smallmouth bass	1995	82	2.753	-4.494	0.91						
	2004	144	2.909	-4.68	0.93	NS			NS		
	2005	65	3.276	-5.523	0.95	***	***		***	***	
Largemouth bass	1995	154	3.145	-5.289	0.86						
	2004	257	3.053	-5.006	0.96	NS			NS		
	2005	137	3.046	-4.965	0.97	NS	NS		NS	NS	
Bluegill	1995	643	2.429	-3.741	0.87						
	2004	107	3.291	-5.371	0.98	****			****		
	2005	131	3.059	-4.818	0.97	****	**		****	**	
Yellow perch	1995	5	3.077	-5.102	0.98						
	2004	71	2.891	-4.698	0.95	NS			NS		
	2005	69	2.979	-4.921	0.91	NS	NS		NS	NS	

[1]Test results symbols for probability (p) levels of significance:
* = $p < 0.05$
** = $p < 0.01$
*** = $p < 0.001$
**** = $p < 0.0001$
NS = not significant. $p > 0.05$

Table 3-15. Habitat[1] and Trophic[2] Guilds, and Tolerance Classifications for Fish Species Present in the 1968-2005 Fish Samples from Hooksett Pool.

Representative Important Species	Habitat Guild	Trophic Guild	Trophic Exceptions	Tolerance	Tolerance Exceptions
Alewife	Lentic and Lotic	Filter Feeder	Invertivore	Intermediate	
American shad	Lentic and Lotic	Invertivore	Filter feeder	Intermediate	
Atlantic salmon (parr and smolts)	Lotic	Insectivore		Intermediate	Intolerant
Smallmouth bass	Lotic	Piscivore	Insectivore	Intermediate	Intolerant
Largemouth bass	Lentic	Piscivore	Insectivore	Intermediate	Tolerant
Pumpkinseed	Lentic	Insectivore	Piscivore, Generalist	Intermediate	
Yellow perch	Lentic	Insectivore	Piscivore, Generalist	Intermediate	
Fallfish	Lotic	Generalist		Intermediate	
White sucker	Lentic and Lotic	Omnivore	Insectivore, Generalist	Tolerant	
Other Fish Species Present	**Habitat Guild**	**Trophic Guild**	**Trophic Exceptions**	**Tolerance**	**Tolerance Exceptions**
American eel	Lentic	Piscivore	Generalist	Intermediate	Tolerant
Common carp	Lentic	Omnivore	Generalist	Tolerant	
Eastern silvery minnow	Lentic	Herbivore	Omnivore	Intermediate	Intolerant
Common shiner	Lentic and Lotic	Insectivore	Generalist	Intermediate	
Golden shiner	Lentic	Omnivore	Insectivore, Generalist	Tolerant	
Spottail shiner	Lentic and Lotic	Insectivore	Generalist	Intermediate	Intolerant
Emerald shiner	Lentic	Insectivore		Intermediate	
Yellow bullhead	Lentic and Lotic	Insectivore	Omnivore, Generalist	Tolerant	Intermediate
Brown bullhead	Lentic	Insectivore	Generalist	Tolerant	Intermediate
Margined madtom	Lotic				
Chain pickerel	Lentic	Piscivore		Intermediate	
Brown trout	Lentic and Lotic	Piscivore	Insectivore	Intermediate	Intolerant
White perch	Lentic	Piscivore	Insectivore	Intermediate	
Rock bass	Lotic	Piscivore	Insectivore	Intermediate	Intolerant
Redbreast sunfish	Lotic	Insectivore	Generalist	Intermediate	
Bluegill	Lentic	Insectivore	Generalist	Intermediate	Tolerant
Black crappie	Lentic	Piscivore	Insectivore, Invertivore	Intermediate	
Tessellated darter	Lentic	Insectivore		Intermediate	

[1]Source: Scarola. J.F. 1987. Freshwater Fishes of New Hampshire. NH Fish and Game Department. 132 p.
[2]Source: Appendix C in: Barbour et al. 1999. *Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers. Second Edition.* EPA 841-B-99-002.
Note: Exceptions were taken when there was disagreement in one or more of the seven references regarding the trophic guild or tolerance classification of a species: the alternatives are shown

Table 3-16. Total catch (N) and relative abundance (%) of fishes caught by trapnet in upper Hooksett pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2&3) and Hooksett Pool (Monitoring Stations 1-3) between 1970's and 2000's.

Common Name	Period											
	1970's						2000's					
	Upper Hooksett Pool		Lower Hooksett Pool		Hooksett Pool		Upper Hooksett Pool		Lower Hooksett Pool		Hooksett Pool	
	N	%	N	%	N	%	N	%	N	%	N	%
American Eel	5	0.2	8	0.2	13	0.2	4	1.5	3	1.2	7	1.3
Black Crappie							3	1.1	8	3.1	11	2.1
Bluegill							6	2.3	32	12.4	38	7.3
Brook Trout	1	0.0			1	0.0						
Brown Bullhead	913	37.6	1317	34.9	2230	36.0	2	0.8	2	0.8	4	0.8
Carp And Minnow Family			8	0.2	8	0.1						
Chain Pickerel	18	0.7	9	0.2	27	0.4	1	0.4			1	0.2
Common Shiner			1	0.0	1	0.0						
Eastern Silvery Minnow							6	2.3			6	1.2
Fallfish	11	0.5	4	0.1	15	0.2	4	1.5			4	0.8
Golden Shiner	9	0.4	48	1.3	57	0.9						
Largemouth Bass	17	0.7	3	0.1	20	0.3						
Margined Madtom	8	0.3			8	0.1	1	0.4	2	0.8	3	0.6
Pumpkinseed	234	9.6	974	25.8	1208	19.5			2	0.8	2	0.4
Redbreast Sunfish	110	4.5	121	3.2	231	3.7	10	3.8	31	12.0	41	7.9
Rock Bass							35	13.3	23	8.9	58	11.1
Smallmouth Bass	109	4.5	210	5.6	319	5.1	77	29.3	146	56.6	223	42.8
Spottail Shiner							96	36.5			96	18.4
Tadpole Madtom			1	0.0	1	0.0						
Tessellated Darter							1	0.4			1	0.2
Walleye	1	0.0			1	0.0						
White Perch	73	3.0	163	4.3	236	3.8						
White Sucker	508	20.9	620	16.4	1128	18.2	7	2.7	4	1.6	11	2.1
Yellow Bullhead	47	1.9	22	0.6	69	1.1	2	0.8	2	0.8	4	0.8
Yellow Perch	365	15.0	263	7.0	628	10.1	8	3.0	3	1.2	11	2.1
Total	**2429**	**100.0**	**3772**	**100.0**	**6201**	**100.0**	**263**	**100.0**	**258**	**100.0**	**521**	**100.0**

Table 3-17. The mean and 95% confidence limits of CPUE for fishes caught by trapnet in upper Hooksett Pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2&3) and Hooksett Pool (Monitoring Stations 1-3) between 1970's and 2000's.

	1970's									2000's								
	Upper Hooksett Pool (N=52)			Hooksett Pool (N=103)			Lower Hooksett Pool (N=51)			Upper Hooksett Pool (N=40)			Hooksett Pool (N=81)			Lower Hooksett Pool (N=41)		
Common Name	95% LCL	CPUE	95% UCL	95% LCL	CPUE	95% UCL	95% LCL	CPUE	95% UCL	95% LCL	CPUE	95% UCL	95% LCL	CPUE	95% UCL	95% LCL	CPUE	95% UCL
American Eel	0.0	0.1	0.2	0.1	0.1	0.2	0.0	0.2	0.3	-0.1	0.1	0.3	-0.0	0.1	0.2	-0.0	0.1	0.2
Black Crappie		0.0			0.0			0.0		-0.1	0.1	0.2	0.0	0.1	0.3	0.0	0.2	0.4
Bluegill		0.0			0.0			0.0		0.0	0.1	0.3	0.3	0.5	0.7	0.4	0.8	1.2
Brown Bullhead	6.3	17.6	28.9	11.0	21.7	32.3	7.3	25.8	44.4	-0.0	0.0	0.1	0.0	0.0	0.1	-0.0	0.0	0.1
Carp And Minnow Family		0.0		-0.1	0.1	0.2	-0.2	0.2	0.5		0.0			0.0			0.0	
Chain Pickerel	0.1	0.3	0.6	0.1	0.3	0.4	0.0	0.2	0.3	-0.0	0.0	0.1	-0.0	0.0	0.0		0.0	
Common Shiner		0.0		-0.0	0.0	0.0	-0.0	0.0	0.1		0.0			0.0			0.0	
Eastern Silvery Minnow		0.0			0.0			0.0		-0.0	0.2	0.3	-0.0	0.1	0.2		0.0	
Fallfish	0.1	0.2	0.4	0.1	0.1	0.2	0.0	0.1	0.2	-0.0	0.1	0.2	-0.0	0.0	0.1		0.0	
Golden Shiner	-0.1	0.2	0.4	0.2	0.6	0.9	0.3	0.9	1.5		0.0			0.0			0.0	
Largemouth Bass	0.1	0.3	0.6	0.1	0.2	0.3	-0.0	0.1	0.1		0.0			0.0			0.0	
Margined Madtom	-0.0	0.2	0.4	-0.0	0.1	0.2		0.0		-0.0	0.0	0.1	-0.0	0.0	0.1	-0.1	0.1	0.2
Pumpkinseed	2.8	4.5	6.2	8.2	11.7	15.2	12.8	19.1	25.4		0.0		-0.0	0.0	0.1	-0.0	0.0	0.1
Redbreast Sunfish	0.9	2.1	3.3	1.4	2.2	3.1	1.2	2.4	3.5	0.1	0.2	0.4	0.1	0.5	0.9	0.0	0.8	1.5
Rock Bass		0.0			0.0			0.0		0.4	0.9	1.4	0.4	0.7	1.0	0.3	0.6	0.9
Smallmouth Bass	1.2	2.1	2.9	2.3	3.1	3.9	2.9	4.1	5.4	1.1	1.9	2.8	1.9	2.8	3.7	2.1	3.6	5.1
Spottail Shiner		0.0			0.0			0.0		-0.8	2.4	5.7	-0.4	1.2	2.8		0.0	
White Perch	0.9	1.4	1.9	1.2	2.3	3.4	1.0	3.2	5.4		0.0			0.0			0.0	
White Sucker	5.7	9.8	13.9	7.0	11.0	14.9	5.2	12.2	19.2	0.0	0.2	0.3	0.0	0.1	0.2	-0.1	0.1	0.3
Yellow Bullhead	0.4	0.9	1.4	0.4	0.7	1.0	0.1	0.4	0.8	-0.0	0.1	0.1	0.0	0.1	0.1	-0.0	0.1	0.1
Yellow Perch	3.3	7.0	10.7	4.0	6.1	8.2	3.2	5.2	7.1	-0.0	0.2	0.4	0.0	0.1	0.3	-0.0	0.1	0.2
Total	**21.6**	**46.7**	**71.8**	**35.9**	**60.2**	**84.5**	**33.8**	**74.0**	**114**	**0.5**	**6.6**	**12.8**	**2.3**	**6.5**	**10.7**	**2.5**	**6.4**	**10.2**

Table 3-18. Taxa richness (number) of fish species of fishes caught by trapnet in upper Hooksett Pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2&3) and Hooksett pool (Monitoring Stations 1-3) during the 1970's and 2000's.

Zone	Period	
	1970's	2000's
Upper Hooksett Pool	16	16
Lower Hooksett Pool	15	12
Hooksett Pool	18	17

Table 3-19. Abundance ranking based on mean CPUE (fish per 48 h) of fishes caught by trapnet during May through September of 1970's and 2000's in upper Hooksett Pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2&3) and Hooksett pool (Monitoring Stations 1-3).

	Upper Hooksett Pool		Lower Hooksett Pool		Hooksett Pool	
Common Name	**1970's**	**2000's**	**1970's**	**2000's**	**1970's**	**2000's**
American Eel	14.0	9.0	11.5	8.0	13.0	9.0
Black Crappie		11.0		5.0		7.0
Bluegill		8.0		2.0		5.0
Brook Trout	15.5				17.5	
Brown Bullhead	1.0	13.0	1.0	12.0	1.0	13.0
Carp And Minnow Family			11.5		14.5	
Chain Pickerel	9.0	14.0	10.0		10.0	16.0
Common Shiner			15.5		17.5	
Eastern Silvery Minnow		7.0				10.0
Fallfish	11.0	10.0	13.0		12.0	12.0
Golden Shiner	12.0		8.0		9.0	
Largemouth Bass	10.0		14.0		11.0	
Margined Madtom	13.0	15.0		9.0	14.5	14.0
Pumpkinseed	4.0		2.0	11.0	2.0	15.0
Redbreast Sunfish	5.0	4.0	7.0	3.0	7.0	4.0
Rock Bass		3.0		4.0		3.0
Smallmouth Bass	6.0	2.0	5.0	1.0	5.0	1.0
Spottail Shiner		1.0				2.0
Tadpole Madtom			15.5		17.5	
Tessellated Darter		16.0				17.0
Walleye	15.5				17.5	
White Perch	7.0		6.0		6.0	
White Sucker	2.0	6.0	3.0	6.0	3.0	8.0
Yellow Bullhead	8.0	12.0	9.0	10.0	8.0	11.0
Yellow Perch	3.0	5.0	4.0	7.0	4.0	6.0

Table 3-20. Decadal (1970's and 2000's) comparison of the Bray-Curtis Percent Similarity Index for the fish communities sampled by trapnets during May through September of all years with consistent sampling effort within upper Hooksett Pool (Monitoring Station 1), lower Hooksett Pool (Monitoring Stations 2&3), and Hooksett Pool (Monitoring Stations 1-3).

Fish Communities Compared	Bray-Curtis Similarity		
	Upper Hooksett Pool	Lower Hooksett Pool	Hooksett Pool
1970's vs.2000's	21.7	24.4	23.2

4.0 Temperature Effects Assessment for Nine Representative Important Species of Fish in Hooksett Pool

4.1 Representative Important Species Rationale

This section of the report presents an assessment of the relationship between the thermal discharge from the Station and nine species of fish that have been observed to be present in the Merrimack River in the vicinity of the Station: the seven Representative Important Species ("RIS") selected and approved by the Merrimack Station Advisory Committee in 1992, and two supplemental species recently suggested but not formally recommended or approved by the Advisory Committee as RIS.

4.1.1 Advisory Committee -Approved Representative Important Species

In a meeting on 5 August 1992, the Advisory Committee unanimously selected and approved seven fish species as RIS for the Station: (1) alewife (*Alosa pseudoharengus*), (2) American shad (*Alosa sapidissima*), (3) Atlantic salmon (*Salmo salar*), (4) smallmouth bass (*Micropterus dolomieu*), (5) largemouth bass (*Micropterus salmoides*), (6) pumpkinseed (*Lepomis gibbosus*), and (7) yellow perch (*Perca flavescens*) (Advisory Committee 1992). There are nearly 40 years of monitoring data collected from the vicinity of the Station for these RIS, which continue to be appropriate and representative species for assessment of potential thermal impacts, consistent with the concept of RIS established by EPA in the draft 316(a) Technical Guidance Manual (USEPA 1977).

The Advisory Committees selection of these RIS for the Station was based in part on its consideration of the following assumptions which EPA directs are to be considered as implicit in the concept of RIS: (1) it is not possible to study in great detail every species at a site; (2) since all species cannot be studied in detail, some smaller number will have to be chosen; (3) the species of concern are those casually related to power plant impacts; (4) some species will be economically important in their own right (e.g., commercial or sport fishes or nuisance species) and thus "important"; (5) some species, termed "representative", will be particularly vulnerable or sensitive to power plant impacts or have sensitivities of most other species and, if protected, will reasonably assure protection of other species at the site; (6) wide-ranging species at the extremes of their ranges would generally not be considered acceptable as "particularly vulnerable" or "sensitive" representative species, but they could be considered as "important"; (7) often, all organisms that might be considered "important" or "representative" cannot be studied in detail, and a smaller list (e.g., greater than one but less than 15) may have to be selected as the "representative and important" list; (8) often, but not always, the most useful list would include mostly sensitive fish, shellfish, or other species of direct use to man or for structure or functioning in the ecosystem; and (9) officially listed "threatened or endangered species" are automatically "important" (USEPA 1977).

4.1.2 Advisory Committee-Suggested Supplemental species

Fallfish (*Semotilus corporalis*), and white sucker (*Catostomus commersoni*) were mentioned by members of the Advisory Committee at a project review meeting held on 5 October 2006. While the two species were not formally recommended or approved by the Advisory Committee for inclusion as RIS for the Station, PSNH and Normandeau decided to include fallfish and white sucker in this assessment. Solely for ease of reference, Sections 4.0 and 5.0 of this report will refer to these two supplemental species as RIS.

4.1.3 Habitat, Trophic and Tolerance Guilds of Station Representative Important Species

The lentic guild of fish represents the community inhabiting slow-flowing or ponded areas of the river like lower Hooksett Pool. The lotic guild of fish represents the community inhabiting the rapid-flowing or turbulent areas of the river like upper Hooksett Pool and the Hooksett Dam tailrace. Therefore, the lentic guild of Station RIS is represented by largemouth bass, pumpkinseed and yellow perch, while the lotic guild of Station RIS is represented by smallmouth bass and fallfish (Table 3-15). White sucker is considered a generalist that occupies both lentic and lotic guilds (Table 3-15). Alewife, American shad and Atlantic salmon are all anadromous species, with the adults passing through both lentic and lotic habitats in the vicinity of the Station during the spawning migration, and their egg, larval and/or juvenile life stages inhabiting the lentic and lotic (alewife, shad) or lotic (shad, salmon) habitats at certain times of the year until they migrate to the sea (Table 3-15).

The nine Station RIS also belong to trophic and tolerance guilds based on their feeding habits and tolerance to non-specific environmental stressors (Barbour et.al. 1999). Although most fish species pass through several trophic guilds as they develop from larvae to adults, they typically spend the majority of time during their life in freshwater as adults. Therefore, the trophic guild assignments and tolerances by Barbour et al. (1999) and used in this report (Table 3-15) are based primarily on the reported feeding habits and tolerance of the adult life stage, unless noted otherwise. Table 3-15 notes exceptions to the primary trophic guild or tolerance classification, which occur where there is disagreement among one or more of the seven references used to select the primary designation.

Alewife and American shad, both native anadromous species valued by anglers as bait (alewife) or sport (shad) fish in lower areas of the river, are being restored to the Merrimack River (currently to Amoskeag Pool) through fish passage improvements at the numerous hydroelectric dams. Alewife juveniles represent the filter feeding trophic guild that is intermediate in their tolerance to pollution, while American shad represent the insectivore trophic guild that is intermediate in its pollution tolerance (Table 3-15). Neither alewife nor American shad can presently migrate upstream into Hooksett Pool because there are no upstream passage facilities (i.e., fish ladders or lifts) installed at Hooksett Dam. Spawning adult alewife are occasionally trapped at the lower dams on the river by the resource agencies and trucked and stocked into Pawtuckaway Lake, where they spawn, and which the young use as nursery habitat throughout the summer months. In the fall (October), the juvenile alewives migrate downstream through the Suncook River, enter lower Hooksett Pool and pass downstream through Hooksett Dam as they proceed to the Atlantic Ocean. Like alewife, American shad are occasionally trapped at the lower dams by the resource agencies and trucked and stocked into Hooksett Pool, where they spawn, and which the young use as nursery habitat throughout the summer months. The last known stocking of American shad in Hooksett Pool was in 2002. In the fall (October), the juvenile American shad migrate downstream through Hooksett Pool and exit over Hooksett Dam as they proceed to the Atlantic Ocean.

Atlantic salmon is also the object of an ongoing restoration effort in the Merrimack River and other New England rivers to develop a self-sustaining population that may eventually support sport fisheries. Atlantic salmon is a native fish species that is a transient inhabitant of Hooksett Pool. If passage were provided at Hooksett Dam, Atlantic salmon adults would have the ability to pass upstream during the spawning migration; the juveniles (smolts) stocked into the upper river watershed tributaries do pass downstream through Hooksett Pool as they migrate to the Atlantic Ocean. Atlantic salmon would not use Hooksett Pool for spawning or nursery habitat because ambient summer temperatures are typically above their preferred levels.

Both smallmouth and largemouth bass are introduced species that are numerically important members of the resident fish community in the Merrimack River. Valued by anglers as gamefish, smallmouth bass typically inhabits lotic habitats in the river near the Station, while largemouth bass live in lentic habitats like that found in lower Hooksett Pool (Table 3-15). Both smallmouth and largemouth bass are considered piscivorous predators that are intermediate in their pollution tolerance (Table 3-15).

Pumpkinseed is a recreationally important native sunfish with a similar in-habitat preference to the introduced bluegill, preferring quiet or slow-moving water. It is particularly abundant in the areas of dense aquatic vegetation that are found in lower Hooksett Pool. Pumpkinseed represent the insectivore trophic guild of fish species that are reported to be intermediate in their pollution tolerance (Table 3-15).

Yellow perch is a lentic insectivore that is abundant in Hooksett Pool (Table 3-15). It is a recreationally important panfish, as well as a non-migratory species that is reported to be intermediate in its pollution tolerance (Table 3-15).

Fallfish is a large minnow species found predominantly in lotic habitat such as that located in upper Hooksett Pool (i.e., Garvins Falls tailwaters) and the Hooksett Dam tailwaters. Fallfish is considered a generalist in its trophic classification, feeding on a wide variety of organisms including insects, fish, crayfish and algae. Fallfish is considered intermediate in its pollution tolerance (Table 3-15).

White sucker is an adaptable member of the sucker family that is found in both lentic and lotic habitats in the river near the Station. It is the most common fish species in New Hampshire (Scarola 1987). White sucker is considered an omnivore that is tolerant of pollution (Table 3-15).

As RIS, these nine fish species represent other non-RIS fishes in the same habitat and trophic guilds, with the same pollution tolerance classifications, found in the river near the Station. Therefore, conclusions in this report about the interaction of each RIS with the Station's thermal discharge are representative of the other members of the fish community within the same habitat guild, trophic guild, and tolerance classification.

4.2 Temperature Effects Assessment for Station RIS

This section presents both a retrospective analysis based on the distribution and life history of each of the nine RIS over the four-decade period examined, and a predictive analysis of the effects (if any) of habitat changes resulting from the Station's historical and continued operations. The combination of a retrospective and a predictive analysis is considered an alternate (Type III) demonstration by EPA (USEPA 1977).

4.2.1 Retrospective Analysis

The retrospective analysis evaluated the occurrence and relative abundance of each RIS found in the vicinity of the Station during a period of comparable and documented electrofish sampling in Hooksett Pool in each of several selected sampling years (i.e., August and September of 1972, 1973, 1974, 1975, 1976, 1994-95, 2004 and 2005) to determine if the interannual trends in RIS abundance in Hooksett Pool during this period substantiate a finding of "no prior appreciable harm" from the Station's discharge.

The field sampling design was consistent over time, requiring sampling of the same Monitoring Stations in Hooksett Pool by the same electrofishing methods during the same period in each sampling year, using documented and consistent procedures, thereby making annual total catch per unit of effort (CPUE) the appropriate response variable in the time series analysis. It is important to hold the sampling design and methods consistent among years in a time series analysis so that any changes detected by the analysis are the result of changes in the biological community sampled and not artifacts of sampling in different locations or at different times in the seasonal cycle of the RIS.

A nonparametric Mann-Kendall test was used to examine the time series for significant increasing or decreasing trends (Helsel and Hirsch 1991, Chapter 12) in annual total CPUE for each of the nine RIS. The Mann-Kendall test is robust with respect to parametric assumptions of data normality and variance heterogeneity (Helsel and Hirsch 1991; Siegel 1956), and was performed on untransformed annual total CPUE. The null hypothesis was that there is no statistically significant ($p<0.05$) interannual trend in abundance during the period analyzed as measured by the Kendall Tau b correlation coefficient. If a statistically significant negative (decreasing) trend was observed, it was interpreted with respect to whether the Station's thermal discharge could be a contributing factor by examining the time series trend in a subset of the data representing the population directly exposed to the thermal plume compared to the population outside of the influence of the plume. Finding no significant trend over time or finding a significant increasing trend was considered to statistically support a finding of "no prior appreciable harm."

4.2.2 Predicted Thermal Effects Analysis

The thermal effect parameters and supporting literature sources for each RIS are provided in Appendix C. The temperature response data fall into six categories: (1) the maximum temperature for summer survival and/or upper incipient lethal temperature ("UILT"), (2) the avoidance temperature, (3) the optimum temperature for growth, (4) the preferred temperature, (5) the temperature of first spawning, and (6) the temperature for egg incubation and larval development (referred to as early life history). The following paragraphs briefly define these terms, and how the thermal response data were developed for each of the six categories.

There are fundamentally two classes of thermal effects parameters among the six categories: exclusionary temperature limits and indicator temperature limits. The maximum temperature and the avoidance temperature are considered "exclusionary" parameters because the fish species will not be found in habitat where the water temperature is at or above the reported maximum or avoidance temperature values for any sustained period of time. The fish species is, therefore, excluded from use of the portion of the habitat for the time that the portion is at or above the reported maximum or avoidance temperature. The remaining four categories of thermal effects parameters – optimum, preferred, spawning and early life history – are considered "indicator" parameters because they are water temperature values that coincide with the physiological or life history events represented by the thermal effects parameters. For example, a given fish species is not likely to change its distribution in response to the water temperature in the habitat occupied that is not at the optimum or preferred temperature. The fish species is likely to remain exposed to water temperatures that are different than the optimum or preferred temperatures for different periods of time rather than actively search for optimum or preferred conditions. Likewise, the spawning and incubation or larval development thermal effects parameters describe the water temperatures occurring during those life history events.

The maximum temperature for summer survival is generally regarded as a peak temperature during the warmest time of the year that can be tolerated by a species for brief time periods, and is therefore considered exclusionary. It is higher than the indicator temperatures. The maximum temperature is routinely derived from field observations. The UILT, on the other hand, is a lethal threshold temperature obtained from laboratory experiments in which fish are removed from a temperature to which they are acclimated, and placed in a range of other temperatures that typically result in a range of survival from 100% to 0%. The ultimate upper incipient lethal temperature ("UUILT") is the temperature beyond which no increase in lethal temperature results from increase in acclimation temperature. The avoidance temperature is the range of temperatures in which fish will spend significantly less time if given an opportunity to move. In this analysis, the avoidance temperature will be considered as the "critical threshold temperature". As stated by EPA, the "critical threshold temperature" for each RIS will be the reported value towards the mid-range of the available avoidance temperatures in the record (USEPA 2006). It is important to understand that fish will avoid water temperatures that exceed the avoidance temperature when escape routes are available, and will not succumb to lethal temperatures unless trapped.

Optimum temperatures for growth are developed from field observation of feeding behavior, which usually yields a range of temperatures, or more precisely from physiological experiments. A commonly used temperature criterion for growth is the maximum weekly average temperature ("MWAT"). The MWAT is considered the highest temperature that will maintain growth of the organism at levels necessary for sustaining actively growing and reproducing populations. The MWAT is calculated as a temperature that should not exceed one-third of the range between the optimum temperature for growth and the UUILT of the species. For many species, the final preferred temperature has been found to be coincident with optimum temperatures for growth and is used as a surrogate for optimum growth temperature when the latter is unavailable.

Since fish are motile, behavior responses to a thermal variation include avoidance, preference or merely physiological adjustment as they pass through or remain exposed to the variation. Determination of temperatures that are avoided and preferred is usually based on laboratory experiments, but field collection data provide useful information when they are reported in the literature or are directly available from the study area. For Hooksett Pool, the presence or absence of fish in the community sampled by electrofishing and trap nets in the Station's cooling canal compared to the water temperature observed at the time of sample collection provides a direct and empirical evaluation of literature-derived avoidance temperatures. The mid-range of the observed and reported temperatures for spawning and for egg incubation and larval development were selected as the indicator temperatures for these life history events.

Thermal effects parameters derived from the scientific literature for each RIS of fish were compared with available thermal data for the Ambient and Thermally-influenced zones of Hooksett Pool and Amoskeag Pool to quantify both the volume of habitat potentially influenced by Merrimack Station's thermal discharge and the seasonal duration of exposure to excessive water temperatures (Normandeau 2007). Table 4-1 summarizes the months of the year during which the suite of thermal effect parameters would be applicable to each RIS, and Table 4-2 presents the thermal effects parameters selected for each of the Station's RIS. The volume of habitat potentially influenced by Merrimack Station's thermal discharge was determined from reasonably available Merrimack River water temperature data observed during nine separate survey dates from May through October to represent the potential thermal exposure of each RIS of fish to Merrimack Station's thermal plume in the source water body throughout the open water period of each year. Seven survey dates from the 1995 Merrimack Station Thermal Discharge Modeling Study (Normandeau 1996) provided direct, *in situ* observations of Merrimack River cross-sections, and the associated water temperature profiles, during the spring (11 May, 24 May, 9 June, 21 June 1995) and fall (14 September, 24 September, 11 October 1995) for Hooksett Pool and for upper Amoskeag Pool (Normandeau 1996). The seven 1995 thermal mapping surveys provided field observations of Merrimack River water temperatures for the following Monitoring Stations (Figures 4-1 and 4-2): (1) two upstream Ambient zone Monitoring Stations (Monitoring Stations N10 and N5), (2) the "end of pipe" station at the entrance of the Station discharge canal into the river mainstem (Monitoring Station S0), (3) the Thermally-influenced Monitoring Stations in lower Hooksett Pool (Monitoring Stations S4, S8, S12, S16, S20 and S24), (4) the Hooksett Dam tailwaters station (Monitoring Station A0), and (5) the upper Amoskeag Pool stations (Monitoring Station A3 and A7). It should be noted that the 1995 Study did not observe water temperature profiles during the mid-summer months of July and August because the Advisory Committee specifically directed the study to examine the spring and fall migratory periods for anadromous fish. Therefore, direct, *in situ* observations of Merrimack River cross-sections, and the associated water temperature profiles, were obtained to represent the intervening summer period not studied in 1995 from the 1978 Merrimack River Monitoring Study for Hooksett Pool (Normandeau 1979b). Thermal profile data obtained during 11 July 1978 and 8 August 1978 provided field observations of Merrimack River water temperatures from the mid-summer period for the following Monitoring Stations (Figure 4-3): (1) three upstream Ambient zone stations (Monitoring Stations N10 and N5, and N1), (2) the "end of pipe" station at the entrance of the Station discharge canal into the river mainstem (Monitoring Station S0), and (3) the Thermally-influenced Monitoring Stations in lower Hooksett Pool (Monitoring Stations S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S14, S18, S22 and S24).These two plume mapping studies provided a total of nine dates during the spring, summer, and fall seasons and created a representative sample of the thermal conditions experienced by the RIS of fish potentially exposed to Merrimack Station's thermal discharge. Merrimack River conditions represented by these nine survey dates were characterized by joint probability distributions (Normandeau 2007) as exhibiting lower than normal flows and average water temperatures, and are therefore somewhat conservative when used to estimate the extent of potential thermal influence on the RIS (Table 4-1). The cross sections from each plume transect for each survey date were also visually examined and used to interpret where in the cross-sectional plane for Hooksett Pool and in upper Amoskeag Pool the thermally-influenced volume occurred, and where near-bottom habitat providing thermal refuge existed for the RIS from UILT and avoidance temperatures during the critical summer period.

The seasonal duration of potential exposure of each RIS of fish to elevated water temperatures in the Merrimack River source water body was quantified by predicting the probability of occurrence of each one-degree Fahrenheit temperature increment during the 1 April to 1 November open water period of a typical year for the average (25% joint probability of occurrence of 50% median flow and 50% median water temperature) and extreme (1% joint probability of occurrence of 10% low flow and 10% high water temperature) thermal environments in Merrimack River for upstream ambient (Monitoring Station N-10), cooling canal discharge (Monitoring Station S-0), lower Hooksett Pool (Monitoring Station S-0), and upper Amoskeag Pool (Monitoring Station A-0) (Normandeau 2007). The "median" scenario represents the typical Merrimack River flow and ambient temperature conditions within which aquatic ecosystems have evolved, with a joint probability of occurrence nominally representing one event out of every four years (i.e. 25%). The "extreme" scenario has a joint probability of occurrence nominally representing once out of every one hundred (years, i.e. 1%). The temporal analysis for each RIS of fish examined both the limiting or exclusionary thermal effects parameters (the UILT and avoidance temperatures) and the indicator thermal effects parameters (the optimum for growth, the preferred, the first spawning, and the early life history temperatures).

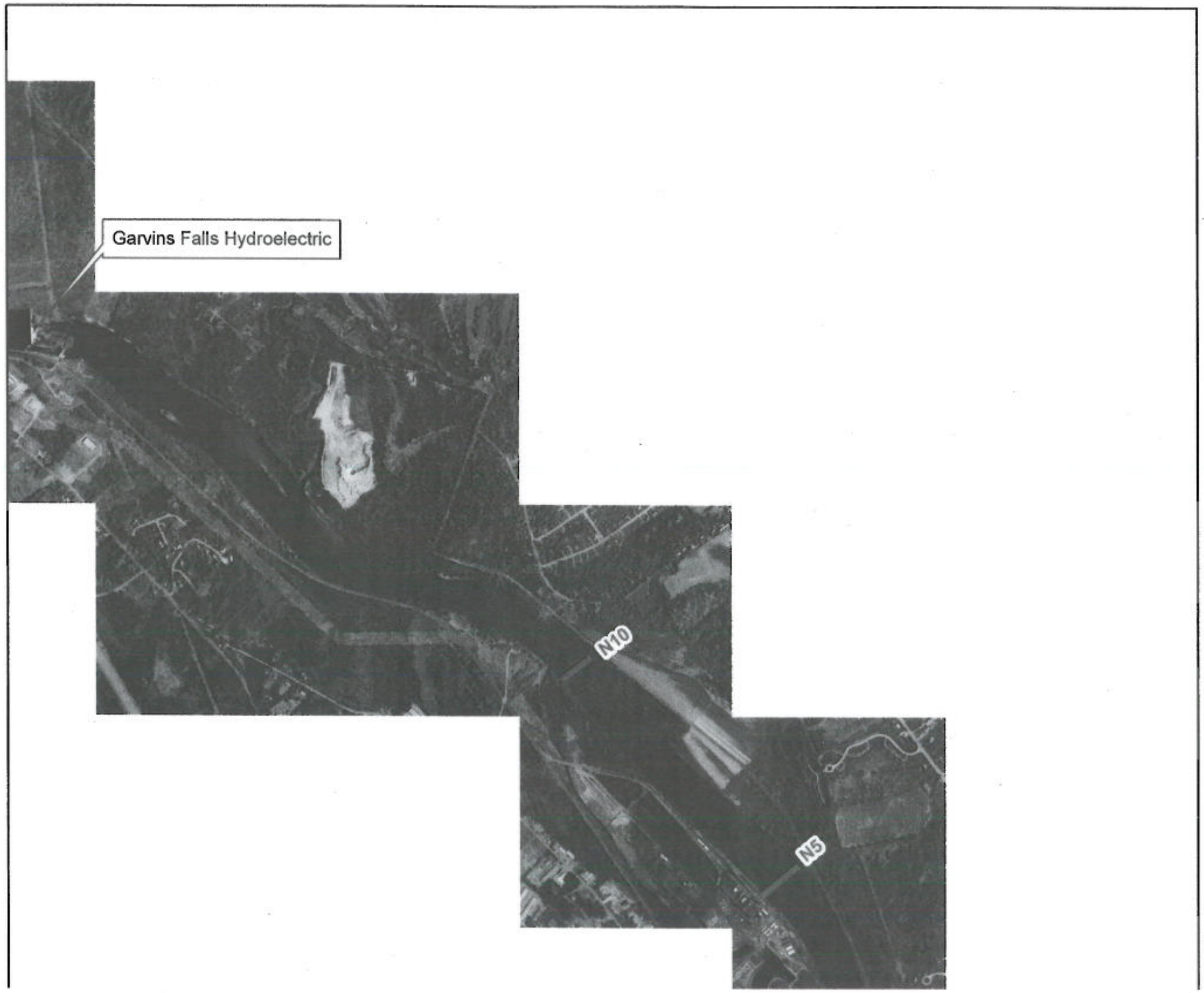
The volume of habitat at or above a specified thermal effects temperature value was calculated and compared to the entire volume of habitat available in three regions of the source water body: (1) the Thermally-influenced portion of lower Hooksett Pool (from the cooling canal discharge downstream to Hooksett Dam, Figure 4-1), (2) the total Hooksett Pool volume (from Garvins Falls Dam downstream to Hooksett Dam Figure 4-1), and (3) upper Amoskeag Pool (from the foot of Hooksett Dam downstream about 3 miles to Monitoring Station A7; Figure 4-2). These three regional volumes were calculated as follows: Longitudinal thermal cross-sections of lower Hooksett Pool, from Monitoring Station S-0 (discharge end of the cooling canal) to Monitoring Station S-24 (lower Hooksett Pool at the log boom just upstream from Hooksett Dam), were generated using Surfer V8.0 Surface Mapping System™. Generated longitudinal cross-sections represented each 1-foot increment of depth in the water column. A percent of the cross-section for each one-foot depth interval which was in exceedance of each thermal parameter for any of the nine RIS was calculated. This percentage was then applied to the calculated volume of its corresponding depth contour to yield a percent exceedance at depth X.

To generate the calculated volume of each depth contour, the estimated river width at depth X was obtained by taking an average of the width values obtained at depth X when measured at Monitoring Stations S-0, S-4, S-8, S-12, S-16, S-20, and S-24. Multiplying the average width by the known length of the reach from Monitoring Station S-0 downstream to Hooksett Dam (12,500 feet) produced the surface area at depth X. To calculate the volume of a given one-foot cross-section, the surface area at depth X plus the surface area at depth X+1 were added than divided by 2. By multiplying the resulting value by the depth between the two contours (in our case 1 foot) the resulting product is the volume of the one-foot cross section between depth X and depth X+1. The value of the summation of the between-contour volumes represents the total volume of the lower portion of Hooksett Pool (S0-Hooksett Dam). The result of this process was a lower Hooksett Pool volume of 79,130,625 ft^3. The volumetric resolution of this method was 100,000 ft^3, representing +- 0.12% of the total.

A value for the total volume of Hooksett Pool, from the Garvin's Falls Dam downstream to the Hooksett Dam, had not been previously calculated from survey data, so an estimate of total Hooksett Pool volume was determined. First, the surface area for Hooksett Pool of 350 acres was obtained from the *2003 Water Quality of the Merrimack Hydroelectric Project Report* (PSNH 2003). An average depth for Monitoring Station S-O was obtained by averaging the depth values (as noted during the 14 September 1995 thermal contour event) at the midpoint and quarter points of the channel. Due to the location of Monitoring Station S-0 near the center point of Hooksett Pool (2.5 miles downstream from Garvins Falls Dam and 2.5 miles upstream from Hooksett Dam), this average depth was considered to be representative of the average depth throughout the entire Hooksett Pool. An estimate of total Hooksett Pool volume was obtained from the product of the total surface area and the estimated average depth, resulting in a total volume of 141,788,385.9 ft^3.

The volume for upper Amoskeag Pool, from the Hooksett Dam tailrace downstream to the Intervale Country Club (Monitoring Stations A-0 to A-7) was calculated in a manner similar to that used in the preceding paragraph for lower Hooksett Pool. Longitudinal thermal cross-sections of upper Amoskeag Pool, from Monitoring Station A-0 (Hooksett Dam tailrace) to Monitoring Station A-7, were generated using Surfer V8.0 Surface Mapping System™, for each one-foot increment of the water column. A percent of the cross-section for each one-foot depth interval which was in exceedance of each thermal parameter for any of the nine RIS was calculated. This percentage was then applied to the calculated volume of its corresponding depth contour to yield a percent exceedance at depth X.

To generate the calculated volume of each depth contour in upper Amoskeag Pool, the estimated river width at depth X was obtained by taking an average of the width values obtained at depth X when measured at Monitoring Stations A-0, A-3, and A-7. Multiplying the average width by the known length of the entire reach (34,141 feet) produced the surface area at depth X. To calculate the volume of a given one-foot cross-section, the surface area at depth X plus the surface area at depth X+1 were added than divided by 2. By multiplying the resulting surface area value by the depth between the two contours (i.e. one foot), the resulting product is the volume of the one-foot cross sectional frustrum between depth X and depth X+1. The volume in each frustrum was then summed from the surface to the bottom to produce the total volume of upper Amoskeag Pool (Monitoring Stations A0-A7) of 192,976,312 ft^3. The volumetric resolution of this method was 100,000 ft^3, representing +-0.05% of the total.


Garvins Falls Hydroelectric
N10
N5

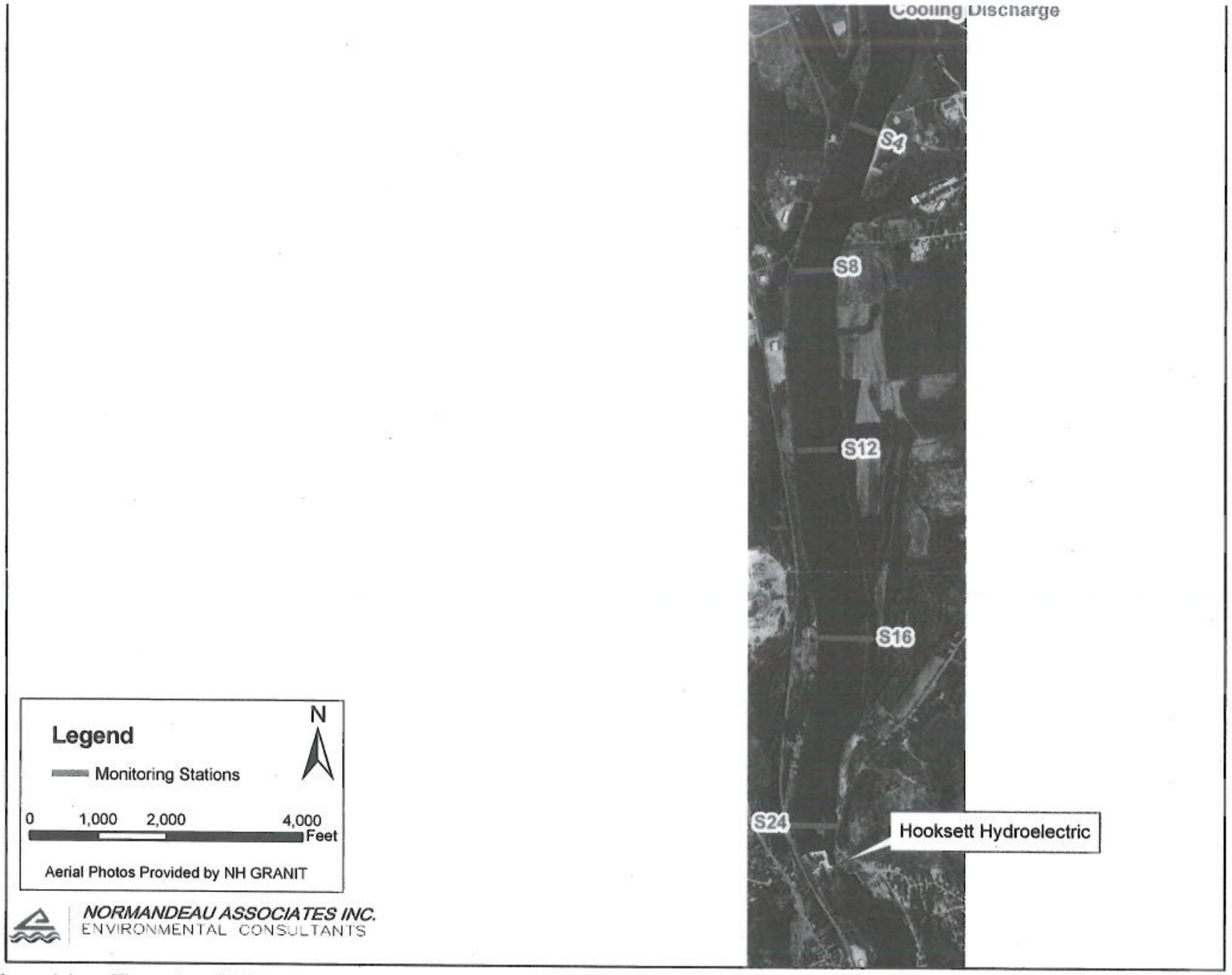
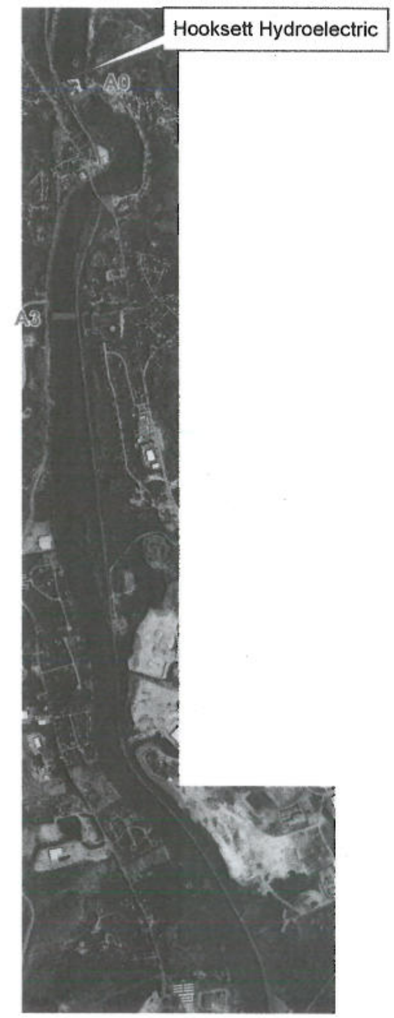


Figure 4-1. Thermal profile Monitoring Stations used during the seven 1995 thermal mapping surveys in Hooksett Pool.


Hooksett Hydroelectric
A0
A3

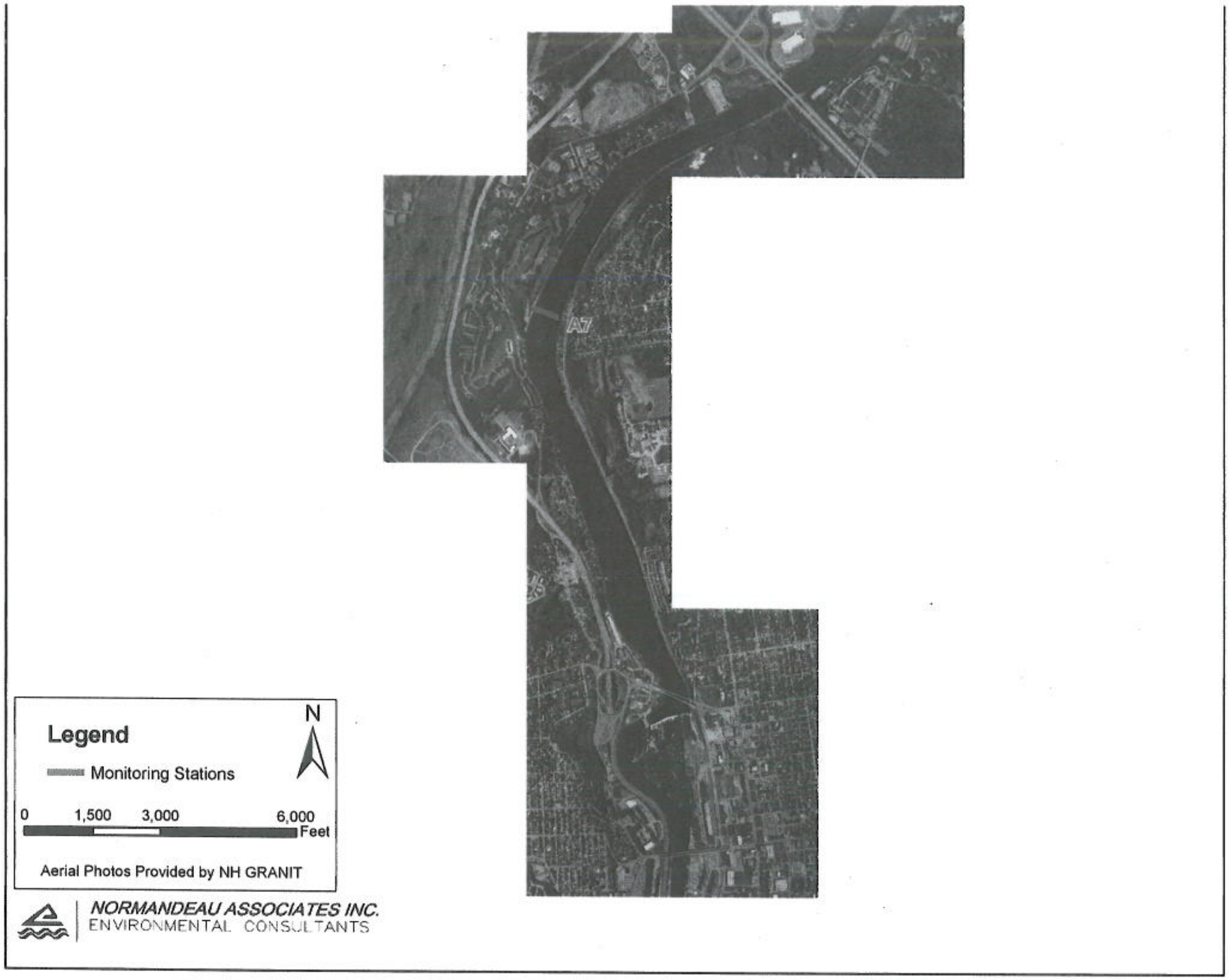


Figure 4-2. Thermal profile Monitoring Stations used during the seven 1995 thermal mapping surveys in Amoskeag Pool.


Garvins Falls Hydroelectric
N10
N5

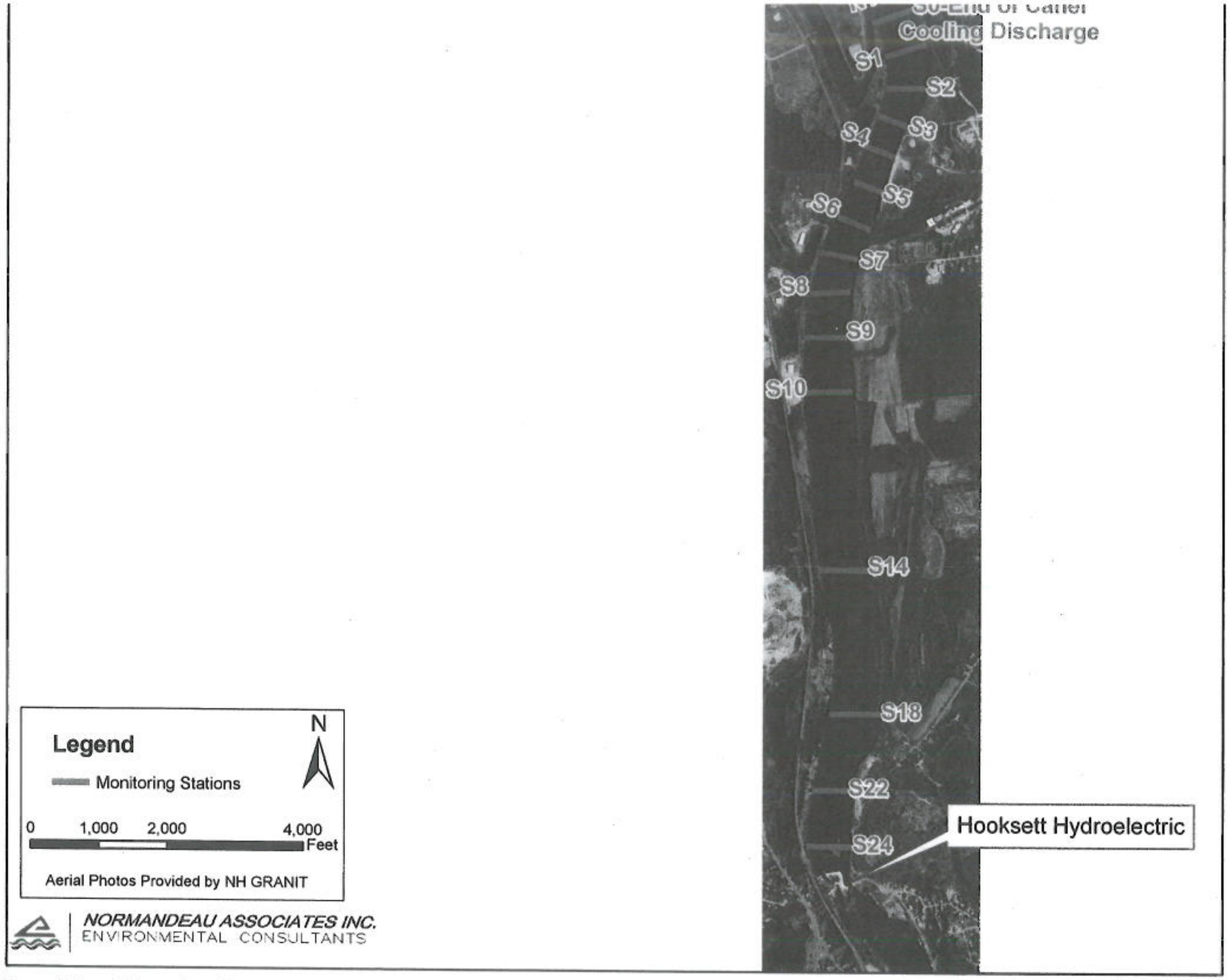


Figure 4-3. Thermal profile Monitoring Stations used during the two 1978 thermal mapping surveys in Hooksett Pool.

Table 4.1 Seasonal Exposure to Thermal Effects Parameters of RIS in Hooksett Pool.

	Exclusionary Temperatures		Thermal Indicator Temperatures			
RIS	**UILT**	**Avoidance**	**Optimum Growth**	**Preferred**	**Spawning***	**Early Life History***
Anadromous						
Alewife	May to October [a]	May to October [a]	May to October [a]	May to October [a]	May to June [b]	May to June [b]
American Shad	May to October [a]	May to October [a]	May to October [a]	May to October [a]	May to June [b]	May to June [b]
Atlantic Salmon	Late-April to Early-June [c]	Late-April to Early-June [c]	Late-April to Early-June [c]	Late-April to Early-June [c]	n/a	n/a
Resident						
Smallmouth Bass	Year Round [a]	Year Round [a]	Year Round [a]	Year Round [a]	Late-April to Early-June [c]	Late-April to Early-June [c]
Largemouth Bass	Year Round [a]	Year Round [a]	Year Round [a]	Year Round [a]	Late-April to Early-June [c]	Late-April to Early-June [c]
Pumpkinseed	Year Round [a]	Year Round [a]	Year Round [a]	Year Round [a]	June to Early-August [d]	June to Early-August [d]
Yellow Perch	Year Round [a]	Year Round [a]	Year Round [a]	Year Round [a]	April to Early-May [e]	April to Early-May [e]
Fallfish	Year Round [a]	Year Round [a]	Year Round [a]	Year Round [a]	May [f]	May [f]
White Sucker	Year Round [a]	Year Round [a]	Year Round [a]	Year Round [a]	Late-April to May [f]	Late-April to May [f]

*As reported in Scarola 1987

[a] - Sampling dates examined for this time period: 11 May. 24 May. 9 June. 21 June. 11 July. 8 August. 14 September. 24 September. 11 October

[b] - Sampling dates examined for this time period: 11 May. 24 May. 9 June. 21 June

[c] - Sampling dates examined for this time period: 11 May. 24 May. 9 June

[d] - Sampling dates examined for this time period: 11 May. 24 May. 9 June. 21 June. 11 July. 8 August

[e] - Sampling dates examined for this time period: 11 May

[f] - Sampling dates examined for this time period: 11 May. 24 May

Table 4-2. **Thermal Effects Parameters Representing the Mid-Point of the Literature-Reported Values for Merrimack Station Representative Important Species of Fish[1].**

	Exclusionary Temperatures		Thermal Indicator Temperatures			
RIS	**UILT**	**Avoidance**	**Optimum Growth**	**Preferred**	**Spawning**	**Early Life History***
Anadromous						
Alewife	90°C	84°C	80°C	84°C	60°C	60°C
American Shad	90°C	86°C	70°C	65°C	65°C	70°C
Atlantic Salmon	82°C	78°C	N/A[2]	N/A	N/A	N/A
Resident						
Smallmouth Bass	98°C	95°C	90°C	81°C	63°C	70°C
Largemouth Bass	95°C	90°C	83°C	86°C	70°C	75°C
Pumpkinseed	94°C	88°C	86°C	86°C	67°C	71°C
Yellow Perch	90°C	83°C	74°C	77°C	50°C	65°C
Fallfish	90°C	82°C	68°C	N/A	60°C	65°C
White Sucker	88°C	86°C	81°C	81°C	60°C	65°C

[1]The literature forming the basis for selection of the thermal effects parameters is reviewed in Appendix C of this report for each RIS of fish.
[2]N/A = not available

5.0 SPECIES ACCOUNTS FOR THE NINE REPRESENTATIVE SPECIES OF FISH IN HOOKSETT POOL

5.1 ALEWIFE

Alewife (*Alosa pseudoharengus*) is a native anadromous species that inhabits the Atlantic Coast waters from Newfoundland south to North Carolina. Alewives are now landlocked in many inland lakes with the greatest number of landlocked populations occurring in the Great Lakes (Scott and Crossman 1973).

Alewives represent the insectivore trophic guild of fish species that are reported to be intermediate in their tolerance to pollution (Table 3-15). Adult and juvenile alewives are both zooplankton feeders, relying on copepods, cladocerans, mysids and ostracods while in freshwater. Adults will also feed on freshwater insect larvae when available (Scott and Crossman 1973).

Alewife that ascend the fish ladder at the Amoskeag Development (located downstream from Hooksett Dam) currently cannot pass upstream into Hooksett Pool because no upstream fish passage facilities have been constructed. Hooksett Dam is part of the Merrimack Project (FERC No. 1893), which consists of three dams, including Amoskeag, Hooksett and Garvins Falls Dams. PSNH anticipates that its new FERC license (FERC 1893) will require the construction of upstream fish passage facilities at Hooksett Dam, in the form of a fish ladder or fish lift, within three years after passage of either 9,500 or more American shad adults or 22,500 river herring (alewife and blueback herring) at the Amoskeag Development fish ladder (constructed in 1989) in any given year. However, during recent relicensing studies at Amoskeag Dam, no American shad adults successfully ascended the Amoskeag fish ladder in 2002 and only 10 shad passed via the ladder in 2003, although hundreds were documented entering the fish ladders entranceway during both years. Only two river herring were documented passing through the fish ladder in 2002 and 185 river herring passed upstream in 2003. In addition, river herring abundance in the Merrimack River has been very low during the past decade compared to early years. For instance, 23,837 river herring passed upstream through the Amoskeag fish ladder in 1989, 10,663 in 1990 and more than 32,000 in 1991. Given the low numbers of American shad and river herring seen passing upstream in recent years at Amoskeag Dam, it is unlikely that upstream fish passage facilities will be built at Hooksett Dam during the next five-year NPDES permit period for the Station.

Periodically over the past two decades, agencies have stocked adult alewives into tributaries to the Merrimack River and directly into Hooksett Pool, and these adult stockings have successfully produced juvenile alewives. During the relicensing of the Merrimack Project (FERC 1893), juvenile alewives from Northwood Lake were captured and used for downstream fish passage studies at the Merrimack Project during 2002 and 2003. Juvenile alewives that descend from Northwood Lake move downstream into Hooksett Pool via the Suncook River. A downstream fish bypass operates at Hooksett Dam during the fall to aid in passing the juvenile alewives downstream.

In August and September of all years with consistent sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), the period of comparable and documented electrofish sampling in Hooksett Pool, alewife were collected during two of 14 total sampling events in this period (Table 3-7). These events occurred during 2004, when 7.8% of the total catch from Hooksett Pool (80 fish) comprised juvenile alewives. The annual average total catch rate (i.e., total catch per unit effort or CPUE of fish per 1000-ft electrofishing transect) of alewives in August and September (combined) of 2004 was 4.0 fish.

The UILT representing the maximum temperature permissible for summer survival of alewife is reported to be 90°F. A literature review for alewife avoidance temperatures provided only springtime limits for spawning streams and did not provide an estimate for the critical summer period. Based on examination of the preferred summer temperatures for adult and young-of-year alewife, the thermal avoidance temperature was conservatively estimated to be 84°F (Appendix C). The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool, the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature), and the four indicator thermal effects parameters (optimum growth, preferred, spawning and early life history temperatures) for alewife are summarized in Table 5-1. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for alewife in Hooksett Pool is summarized in Table 4-1. As a migratory species, juvenile alewife will potentially utilize habitat within Hooksett Pool during the time period of May through October. For alewife, it is only during those months that thermal exceedances of UILT, avoidance, optimum growth and preferred temperature limits should be examined. Spawning and life history thermal requirements need only be examined during the months of May and June when alewife in NH are known to be actively spawning (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT for alewife was not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 1 April to 1 November period (Table 5-2). Examination of the frequency of occurrence of water temperatures data revealed that the UILT temperature for alewife would not be exceeded under median river flow and ambient water temperature conditions (with a probability of occurrence of one year out of every four years) throughout Hooksett Pool and in upper Amoskeag Pool, and would not be exceeded during rare or extreme conditions of low river flow and high ambient water temperatures (with a probability of occurrence of one year out of every 100 years) (Table 5-3). Only in the artificial habitat found within the man-made structure of Merrimack Station's cooling canal under summer conditions of low flow and warm ambient conditions are water temperatures predicted to exceed the UILT temperature for alewife (102 days for the extreme case and 81 days for the median case; Table 5-3).

The avoidance temperature of 84°F for alewife was not exceeded at any time between 1 April and 1 November in upper Hooksett Pool or in upper Amoskeag Pool during the 1995 and 1978 Thermal Studies (Table 5-2). Within lower Hooksett Pool, the avoidance temperature of 84°F for alewife was exceeded at just one Monitoring Station, the end of pipe or cooling canal discharge Monitoring Station S-0, on two dates, 21 June 1995 and on 14 September 1995. Observed water temperatures that exceeded the avoidance temperature of alewife on 21 June 1995 represented 2.7% of the available habitat in lower Hooksett Pool (also representing 1.5% of the total Hooksett Pool habitat) and were limited to the upper three feet of the water column in a total column depth of between 6 feet (west) and 10 feet (east) at Monitoring Station S-0. Observed water temperatures that exceeded the avoidance temperature of alewife on 14 September 1995 represented 0.5% of the available habitat in lower Hooksett Pool (also representing 0.3% of the total Hooksett Pool habitat), and were limited to the upper three feet of the water column along the eastern bank of Monitoring Station S-0 (in a total column depth of 10 feet).

With respect to the indicator thermal effects parameters for alewife springtime activities, the approximate mid-range of the reported spawning temperatures and a conservative estimate of the peak hatching and larval survival range is 60°F (Appendix C). Alewives in coastal New Hampshire rivers will typically begin making upstream movements for spawning during the first week of May (Scarola 1987), two weeks prior to when the first of the 1995 thermal plumes were mapped. Through visual inspection of the cross-sectional contours of the thermal plume, it was determined that during the spring season within upper Hooksett Pool, ambient river water temperatures exceeded 60°F on three of the four survey dates during 1995 (24 May, 9 June and 21 June; Table 5-2). This means that upstream ambient thermal conditions in Hooksett Pool are naturally warmer than the preferred incubation temperature for alewife eggs and that these fish would likely spawn prior to these conditions occurring. The warm ambient conditions were also reflected in lower Hooksett Pool and in upper Amoskeag Pool, which exhibited water temperatures above 60°F on the same three dates. River water temperatures did not exceed the preferred spawning temperature anywhere in upper Hooksett pool or in upper Amoskeag Pool during the 11 May 1995 survey. River water temperatures exceeded the preferred spawning temperature for alewife within the upper foot of the water column at Monitoring Station S-0, comprising 1.3% of the available habitat in lower Hooksett Pool (also comprising 0.7% of the total Hooksett Pool habitat) during the first spring survey on 11 May 1995.

Reported year-round indicator thermal effect parameters for alewife are an optimum temperature for growth of 80°F and a preferred temperature of 84°F (Appendix C). The optimum growth temperature for alewife was not exceeded in Hooksett Pool during six of the nine survey dates (11 May, 24 May, 9 June, 8 August, 27 September, 11 October; Table 5-2). During the 21 June 1995 event, the optimum temperature for growth of alewives was exceeded in 22.6% of the available habitat found in the lower Hooksett Pool (also representing 12.6% of the total Hooksett Pool habitat). Temperature exceedances on 21 June 1995 were observed to penetrate within the water column from the surface to a maximum depth of four feet at Monitoring Station S-0, and within the one-foot depth contour at Monitoring Stations S-8 through S-20. During the 11 July 1978 event, 0.4% of the available habitat in lower Hooksett Pool had an observed water temperature greater than 80°F. This volume of exceedance was limited to the upper two feet of the water column at the end of pipe location represented by Monitoring Station S-0. The optimum temperature for growth of alewife was exceeded in upper Hooksett Pool during the 14 September 1995 event at Monitoring Station N-5. During the 14 September 1995 survey, the volume of river water above 80°F represented 21.8% of the available habitat in lower Hooksett Pool (also representing approximately 12.2% of the total Hooksett Pool habitat). River water temperature exceedances were observed in the upper three feet of the water column between Monitoring Stations S-0 and S-12 during the 14 September 1995 survey. Observed river water temperatures in upper Amoskeag Pool did not exceed the optimum growth temperature for alewife on any of the nine sampling events during the 1978 and 1995 Thermal Studies. During the four spring, two summer and three fall sampling events, the preferred temperature for alewife was exceeded twice, once on 21 June 1995 and again on 14 September 1995. The spring season temperature exceedence occurred within the upper three feet and only at the cooling canal discharge (Monitoring Station S-0), representing 2.7% of the available habitat in lower Hooksett Pool (also representing 1.5% of the total Hooksett Pool habitat). The fall season temperature exceedence also occurred only at the cooling canal discharge (Monitoring Station S-0) within the top third of the water column along the east bank in a total column depth of 10 feet, representing 0.5% of the available habitat in lower Hooksett Pool (also representing 0.3% of the total Hooksett Pool habitat).

5.2 American Shad

American shad (*Alosa sapidissima*) is a native anadromous species that inhabits the Atlantic Coast waters from Newfoundland south to Florida, and that is most abundant from Connecticut to North Carolina. American shad were introduced on the Pacific Coast in 1871 into the Sacramento and Columbia Rivers. They can now be found from southern California to Cooks Inlet, Alaska (Scott and Crossman 1973).

American shad juveniles represent the insectivore trophic guild of fish species that are reported to be intermediate in their tolerance to pollution (Table 3-15). Juvenile American shad have also been classified in the filter feeder trophic guild by some researchers and feed on *Daphnia* sp., immature midges (chironomids), and other freshwater planktonic crustaceans (Scott and Crossman 1973). While migrating upstream, adult American shad consume little to no food.

Currently, adult American shad that ascend the Amoskeag Development fish ladder (located downstream from Hooksett Dam) in the spring are unable to ascend into Hooksett Pool because no upstream fish passage facilities have been constructed. PSNH anticipates that its new FERC license (FERC 1893) will require the construction of upstream fish passage facilities at Hooksett Dam within three years after passage of either 9,500 or more American shad adults or 22,500 river herring (alewife and blueback herring) at the Amoskeag Development fish ladder in any given year. Given the low numbers of American shad and river herring seen passing upstream in recent years at Amoskeag Dam (Section 5.1 above), it is unlikely that upstream fish passage facilities will be built at Hooksett Dam during the next five-year NPDES permit period for the Station.

Although no upstream fish passage facilities currently exist at Hooksett Dam, agencies have recently stocked adult American shad into the Hooksett Pool. In spring 2002, agencies stocked 1,861 adult shad into Hooksett Pool via truck; it is assumed that these fish spawned successfully because it was documented that up to 750 juvenile shad were captured after passing through the Amoskeag Dam fish bypass during the fall. These juvenile shad spent the summer and fall in Hooksett Pool and demonstrated excellent growth. They were nearly twice the size of the juvenile alewives that were captured after migrating downstream from Northwood Lake in the same year (which were progeny from adult alewives stocked into the lake by the resource agencies during that spring). It is possible that trucking and stocking activities by the resource agencies may expand in the near future because a new stocking truck was purchased during 2006 for this purpose.

In August and September of all years with consistent sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), the period of comparable and documented electrofish sampling in Hooksett Pool, neither juvenile nor adult American shad were observed within any zone of Hooksett Pool sampled by electrofishing. Sampling did not occur during 2002, when American shad juveniles were known to be present in Hooksett Pool due to resource agency stocking efforts.

The UILT representing the maximum temperature permissible for summer survival of American shad is reported to be 90ºF, and the thermal avoidance temperature 86ºF (Appendix C). The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool, the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature), and the four indicator thermal effects parameters (optimum growth, preferred, spawning and early life history temperatures) for American shad are summarized in Table 5-4. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for American shad in Hooksett Pool is summarized in Table 4-1. As a migratory species, juvenile American shad will potentially utilize habitat within Hooksett Pool during the time period of May through October. For American shad, it is only during those months that thermal exceedances of UILT, avoidance, optimum growth and preferred temperature limits should be examined. Spawning and life history thermal requirements need only be examined during the months of May and June when American shad in NH are known to be actively spawning (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT for American shad was not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 1 April to 1 November period (Table 5-5). Examination of the frequency of occurrence of water temperatures data revealed that the UILT temperature for American shad would not be exceeded under median river flow and ambient water temperature conditions (with a probability of occurrence of one year out of every four years) throughout Hooksett Pool and in upper Amoskeag Pool, and would not be exceeded during rare or extreme conditions of low river flow and high ambient water temperatures (with a probability of occurrence of one year out of every 100 years; Table 5-3). Only in the artificial habitat found within the man-made structure of Merrimack Station's cooling canal under summer conditions of low flow and warm ambient conditions are water temperatures predicted to exceed the UILT temperature for American shad (102 days for the extreme case and 81 days for the median case; Table 5-3).

The avoidance temperature of 86°F for American shad was not exceeded at any time between 1 April and 1 November in upper Hooksett Pool or upper Amoskeag Pool during the 1995 or 1978 Thermal Studies. Within lower Hooksett Pool, the avoidance temperature was exceeded at the cooling canal discharge (S0) on 21 June 1995. Temperatures greater than the avoidance temperature of American shad on 21 June 1995 represented 0.2% of the lower Hooksett Pool habitat (also representing 0.1% of the total Hooksett Pool habitat) and were limited to the surface waters (upper foot) at Monitoring Station S0.

With respect to the indicator thermal effects parameters, the lower mid-range spawning temperature for favorable hatching success is 65°F and the mid to upper incubation temperature for favorable hatching success is 70°F (Appendix C). Within upper Hooksett Pool and upper Amoskeag Pool, the ideal spawning temperature for American shad was not exceeded during the 11 May or 24 May survey dates. The ideal American shad spawning temperature was exceeded within upper Hooksett Pool during the 9 June and 21 June events at Monitoring Stations N10 and N5. This means that upstream ambient thermal conditions in Hooksett Pool were naturally warmer than the preferred incubation temperature for American shad eggs and that water temperatures were in excess of 65°F in 100% of the total Hooksett Pool habitat during June. Within lower Hooksett Pool, the favorable hatching temperature was exceeded during the 24 May 1995 event at the cooling canal discharge (S0). This temperature exceedence represented 1.2% of the available habitat in lower Hooksett Pool (also comprising 0.7% of the total Hooksett Pool habitat) and occurred within the upper three feet of the water column on the western side of the river. Within upper Amoskeag Pool, river water temperatures did not exceed the favorable hatching temperature for American shad on the survey dates of 11 May and 24 May. However, river water temperatures in upper Amoskeag Pool did exceed the favorable hatching temperature for American shad on 9 June and 21 June within 100% of the available habitat in upper Amoskeag Pool, as would be expected given the ambient conditions in upper Hooksett Pool on those dates.

The mid to upper incubation temperature for favorable hatching success of 70°F was not exceeded within upper or lower Hooksett Pool or upper Amoskeag Pool on the survey dates of 11 May and 24

May. Within lower Hooksett Pool, the favorable hatching temperature was exceeded during the 9 June 1995 event at Monitoring Stations S0 through S24. These exceedances represented 49.5% of the available habitat in lower Hooksett Pool (also comprising 27.6% of the total Hooksett Pool habitat). The temperature exceedances extended from a maximum water column depth of 9 feet at S20 to a minimum of three feet at S0, S4, and S8. Temperatures within upper Amoskeag Pool followed the same trend as those from lower Hooksett Pool for the survey date of 9 June. Within upper Hooksett Pool, the favorable incubation temperature was exceeded during the 21 June event and these thermal conditions represented 100% of the available habitat in upper and lower Hooksett Pool and upper Amoskeag Pool.

Reported year-round indicator thermal effect parameters for American shad are an optimum temperature for growth of 70°F and a preferred temperature of 65°F (Appendix C). The optimum growth temperature for American shad was not exceeded within Hooksett Pool during two of the four spring season thermal surveys (May 11 and May 24). Within lower Hooksett Pool, the favorable growth temperature was exceeded during the 9 June 1995 event at Monitoring Stations S0 through S24. These exceedances represented 49.5% of the available habitat found in lower Hooksett Pool (also comprising 27.6% of the total Hooksett Pool habitat). Within lower Hooksett Pool, the temperature exceedances extended from at maximum water column depth of 9 feet at S20 to a minimum of three feet at S0, S4, and S8. The American shad optimum temperature for growth success of 70°F was exceeded within 100% of the available upper and lower Hooksett Pool habitat during the 21 June 1995 event. During the both sample dates in June, temperatures greater than the optimum growth temperature for American shad represented 100% of the available upper Amoskeag Pool habitat. During the two summer season temperature profiling events (11 July and 8 August). 100% of the available Hooksett Pool habitat had a temperature in excess of 70°F. The optimum growth temperature was not exceeded during one of the three fall season temperature profiling events (27 September) within any available habitat found in lower or upper Hooksett Pool or upper Amoskeag Pool. The optimum growth temperature was exceeded within upper Hooksett Pool during the 14 September 1995 at Monitoring Station N5. As would be expected, river temperatures exceeded 70°F in 100% of the available habitat in lower Hooksett Pool (S0 through S24) and in the upper Amoskeag Pool on this date. During the 11 October 1995 sampling event, river temperatures exceeded the optimum growth temperature, but only at the cooling canal discharge (S0). Temperatures in excess of 70°F were restricted to the upper five feet of the water column and represented 1.7% of the habitat in lower Hooksett Pool (also comprising 1.0% of the total Hooksett Pool habitat) on 11 October 1995.

Temperatures within upper Hooksett Pool and upper Amoskeag Pool were not in excess of the preferred temperature of American shad (65°F) on 11 May 1995, 24 May 1995, 27 September 1995 or 11 October 1995. The preferred temperature was exceeded by ambient thermal conditions during the 9 June 1995, 21 June 1995, 11 July 1978, 8 August 1978, and 14 September 1995 events within upper Hooksett Pool (N10 and N5). As would be expected, 100% of the available habitat in lower Hooksett Pool and upper Amoskeag Pool exceeded the American shad preferred temperature on those survey dates. During the 24 May 1995 event, temperatures in excess of 65°F occurred only at the end of the cooling canal (S0), were limited to the upper two feet of the water column, and represented 1.2% of the available habitat found in lower Hooksett Pool (also comprising 0.7% of the total Hooksett Pool habitat). During the 27 September 1995 event, temperatures were in excess of 65°F in lower Hooksett Pool (S0 through S24), representing 36.3% of the available habitat found in lower Hooksett Pool (also comprising 20.2% of the total Hooksett Pool habitat). Temperatures greater than 65°F were limited to the upper five feet of the water column at Station S4, the upper four feet at Stations S0, S20 and S24, the upper three feet at Monitoring Stations S12 and S16, the upper two feet at Monitoring Station S8. During the 11 October 1995 event, river water temperatures in excess of the American shad preferred temperature were observed at the end of the cooling canal discharge (S0) and at Monitoring Stations S4, S8 and S12 in lower Hooksett Pool, representing 19.5% of the available lower Hooksett Pool habitat (also comprising 10.9% of the available Hooksett Pool habitat). Temperatures greater than 65°F were limited to the upper six feet of the water column at S0, the upper three feet at S4, the upper two feet at S8, and the upper foot at S12.

5.3 ATLANTIC SALMON

Atlantic salmon, an anadromous fish, inhabits the North Atlantic Ocean basin from Greenland to the Connecticut River (Scott and Crossman 1973). While native to the Merrimack River, it was extirpated with construction of the downstream dams. It is presently the subject of restoration efforts, with the result that the current population in the river is essentially entirely maintained by stocking of fry and smolts.

The following life history information is summarized from Stanley and Trial (1995). In New England, Atlantic salmon spawn in gravely tributaries of major river systems in the fall. There, the eggs overwinter and hatch into young, termed parr. Parr remain in fresh water for one or two years before undergoing a physiological transformation to the smolt stage that prepares the fish for life in the sea. Once smoltification begins in April and May, the fish move into the mainstem of the river and migrate downstream to the Atlantic Ocean. The salmon will usually spend two winters at sea before returning as adults to their natal stream in May to July to spawn. Unlike Pacific salmon, Atlantic salmon do not necessarily die after spawning, but can return to the ocean and return to spawn again.

The Atlantic salmon restoration program in the Merrimack River that began in 1976 is ongoing, and agencies continue to capture adult sea-run Atlantic salmon downstream of the Essex Dam in Lawrence, MA. These adult salmon are transferred to a hatchery for egg production. The salmon eggs are hatched and the fry used to stock tributaries to the river, including the Pemigewasset River and its East Branch, Souheagan River, Piscataquaog River, Smith River, Baker River and Mad River. In addition to the salmon fry stocking, agencies annually stock into the lower river (downstream of Merrmiack Station) approximately 50,000 one-year-old smolts that have been raised at the Green Lake National Fish Hatchery in Maine. Adult brood stock that are no longer useful for fry production are also stocked into the upper river (upstream of Merrimack Station) each year to support a popular fishery for this species, and hundreds of these adult fish have been seen each spring passing the Garvins Falls Hydroelectric development and entering upper Hooksett Pool.

A downstream bypass at Hooksett Dam operates each spring to pass Atlantic salmon smolts that originated from the fry stocking in the river tributaries located upstream of Hooksett Dam. Upstream fish passage facilities have not been installed at Hooksett Dam at this time, but an upstream fish ladder has been installed at the Amoskeag Development, the next dam downstream from Hooksett Dam. Hooksett Dam is part of the Merrimack Project (FERC No. 1893), which consists of three dams, including Amoskeag, Hooksett and Garvins Falls Dams. The Merrimack Project is awaiting development-specific fish prescriptions in its new FERC license. It is anticipated the new license will require that upstream fish passage facilities at Hooksett Dam be constructed and operational within three years after passage of either 9,500 or more American shad adults or 22,500 or more river herring (alewife and blueback herring) in any given year at the Amoskeag Development. Given the low numbers of American shad and river herring seen passing upstream in recent years at Amoskeag Dam, it is unlikely that upstream fish passage facilities will be built at Hooksett Dam during the next five-year NPDES permit period for the Station.

In August and September of all years with consistent sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), the period of comparable and documented electrofish sampling in Hooksett Pool, neither juvenile nor adult Atlantic salmon have been observed within any zone of Hooksett Pool sampled by electrofishing.

Most of the fry stocking efforts in the river basin have been in the headwaters and tributaries of the river, all upstream from the Station. If a wild population becomes established in the river, spawning will most likely occur in these upstream tributaries with suitable habitat for spawning and parr survival. Reproduction in the mainstem of the river, i.e., in the vicinity of the Station, is highly unlikely due to lack of preferred spawning and nursery habitat, and because ambient river water temperatures naturally exceed Atlantic salmon preferred values. Thus, the relevant potential interaction between the thermal plume and Atlantic salmon will occur primarily during the transient upstream migration of adults and downstream migration of smolts. The effects of the Station's thermal discharge on the downstream migration of Atlantic salmon smolts has been assessed in a separate study, the results of which demonstrate that the Station's thermal discharge has neither delayed nor created a barrier to the downstream migration of Atlantic salmon smolts (Normandeau 2006).

The thermal effects data reviewed for this assessment confirm that, in addition to other habitat variables, the thermal environment throughout lower Hooksett Pool and the Hooksett Dam tailrace in upper Amoskeag Pool is not optimum for young salmon parr, with the result that this lifestage is unlikely to naturally occur in this reach of the river. Available temperature effects literature does not include avoidance temperatures for salmon adults or smolts. However, since parr are able to tolerate 82 °F, and adult Atlantic salmon move through the Amoskeag Dam fishway at temperatures as high as 77°F, it is reasonable to use 78°F as a presumed avoidance temperature for salmon smolts and adults (Appendix C). The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool and the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature) for Atlantic salmon are summarized in Table 5-6. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for Atlantic salmon in Hooksett Pool is summarized in Table 4-1. Habitat within Hooksett Pool for the spawning and early life history requirements of Atlantic salmon is not available. As a result, Hooksett Pool serves only as a migratory path for salmon smolts on their downstream migration. The timing of this migration period in Hooksett Pool and the Merrimack River runs from late-April through early-June and as a result, it is only during those months that thermal exceedances of UILT and avoidance temperature limits should be examined (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT for Atlantic salmon was not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 11 May, 24 May and 9 June study dates (Table 5-6). The river volume above the UILT for Atlantic salmon represented 7.0% of the available habitat in lower Hooksett Pool on 21 June 1995 (also representing 3.9% of the total Hooksett Pool habitat).

Using the exclusionary avoidance temperature of 78°F for salmon parr (as a surrogate thermal effects parameter for Atlantic salmon smolts and adults who are transient inhabitants of Hooksett Pool during their migrations), a visual inspection of the cross-sectional contours of the thermal plume as mapped during the 1995 Thermal Study was conducted. During the spring season when smolts would be present and moving downstream through Hooksett Pool, it was observed that the presumed avoidance temperature was not exceeded within upper or lower Hooksett Pool or upper Amoskeag Pool on the study dates of 11 May, 24 May and 9 June 1995. The agencies have agreed that the Merrimack River smolt migration is mostly over by May 31.

5.4 SMALLMOUTH BASS

Smallmouth bass (*Micropterus dolomieu*) is a non-native resident (non-migratory) fish species that was introduced into New Hampshire waters during the 1860's (Scarola 1987). The native range for this species was limited to the Great Lakes-St. Lawrence system and the systems of the Ohio, Tennessee, and upper Mississippi Rivers. This species now occurs almost everywhere in the United States (Scott and Crossman 1973). Smallmouth bass inhabit cool and warm, generally clear, large creeks, streams, and rivers with gravelly and rocky substrates. Often they become a dominant species in reservoirs that impound streams with the above attributes (Jenkins and Burkhead 1993). Usually they are found around the protection afforded by the rocks of shoals and talus slopes, or submerged vegetation in moderately shallow water (Scott and Crossman 1973).

Smallmouth bass represents the lotic piscivore trophic guild of fish species that are reported to be intermediate in their tolerance to pollution (Table 3-15). Some researchers consider smallmouth bass to be insectivorous and intolerant to pollution (Table 3-15). This alternate trophic guild applies to early life stages of this species. There is a progression in feeding, with increase in size from plankton, to immature aquatic insects, to crayfish and fishes (Scott and Crossman 1973).

As a RIS, smallmouth bass also represents other non-RIS lotic piscivores with intermediate tolerance found in Hooksett Pool, including primarily rock bass (Table 3-15). Therefore, conclusions about the interaction of smallmouth bass with the Station's thermal discharge can be applied to other members of the fish community within the same trophic guild and tolerance classification (USEPA 1977).

In August and September of all years with consistent sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), the period of comparable and documented electrofish sampling in Hooksett Pool, juvenile and adult smallmouth bass have been numerically important components of the river fish community sampled by electrofishing. They are found throughout Hooksett Pool, including within the cooling canal and in natural habitats exposed to the thermal discharge. Smallmouth bass were 1.2% of the overall electrofishing catch in 1972, 11.4% in 1973, 5.9% in 1974, 12.3% in 1976, 1.1% in 1995, 11.2% in 2004 and 8.5% in 2005. Relative abundance was greatest for smallmouth bass during 1976 (14.2%) and lowest during 1995 (0.4%) among the seven years sampled in upper Hooksett Pool. Smallmouth bass relative abundance in Thermally-influenced portion of lower Hooksett Pool ranged from a high of 15.7% in 2004 to a low of 1.5% in 1972 among the seven years sampled.

The annual total catch rate (i.e., total catch per unit effort or CPUE of fish per 1000-ft electrofishing transect) of smallmouth bass in August and September (combined) of 1972 through 2005, the period of comparable and documented electrofishing effort for fish monitoring in Hooksett Pool (Table 3-7), was highest in 2004 (CPUE = 5.4 fish) and lowest in 1972 (CPUE = 0.8 fish). When the total catch rate was partitioned into Ambient Hooksett Pool and the Thermally-influenced zone of Hooksett Pool, the annual catch rate within Ambient Hooksett Pool ranged from a high CPUE of 7.7 fish in 2004 to a low of 0.6 fish in 1972. The annual catch rate in Thermally-influenced zone of Hooksett Pool peaked in 1973 (CPUE = 5.7 fish) and was lowest during 1972 (CPUE = 1.0 fish).

No statistically significant negative (decreasing) trends were observed in smallmouth bass annual mean CPUE comparable August and September time period of electrofish sampling in Hooksett Pool, supporting a finding of "no prior appreciable harm" from Merrimack Station's thermal discharge during this four-decade period. The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of 0.238 with a probability level of p=0.453 (Figure 3-3). The electrofishing time series from ambeint Hooksett Pool exhibited a Kendall's Tau b of 0.333 with a probability level of p=0.293 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of -0.238 with a probability level of p=0.452.

The UILT representing the maximum temperature permissible for summer survival of smallmouth bass is reported to be 98°F, and the thermal avoidance temperature 95°F (Appendix C). The 95°F value was selected even though the EPA would allow the use of 97.5°F, which is the reported value toward the mid-range of the available avoidance temperatures. The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool, the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature), and the four indicator thermal effects parameters (optimum growth, preferred, spawning and early life history temperatures) for smallmouth bass are summarized in Table 5-8. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for smallmouth bass in Hooksett Pool is summarized in Table 4-1. As a resident species, smallmouth bass will utilize habitat within Hooksett Pool throughout the year and as a result, thermal exceedances of UILT, avoidance, optimum growth and preferred temperature limits should be examined for that entire time period. Spawning and life history thermal requirements need only be examined from late-April to early-June when smallmouth bass in NH are known to be actively spawning (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT and avoidance temperatures for smallmouth bass was not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 1 April to 1 November period (Table 5-9). Examination of the frequency of occurrence of water temperatures data revealed that the UILT and avoidance temperatures for smallmouth bass would not be exceeded under median river flow and water temperature conditions (with a probability of occurrence of one year out of every four years) throughout Hooksett Pool and in upper Amoskeag Pool, and would not be exceeded during rare or extreme conditions of low river flow and high ambient water temperatures (with a probability of occurrence of one year out of every 100 years) (Table 5-3). Only in the artificial habitat found within the man-made structure of Merrimack Station's cooling canal under summer conditions of low flow and warm ambient conditions are water temperatures predicted to exceed the UILT temperature (29 days for the extreme case and 0 days for the median case) or the avoidance temperature (67 days for the extreme case and 14 days for the sverage case) for smallmouth bass (Table 5-3).

The presence or absence of smallmouth bass and the corresponding measured water temperatures at the time of sampling were used as an *in situ* assay of literature values for smallmouth bass avoidance temperature and UILT derived from laboratory studies, by examining the electrofishing and trapnet data collected in the Station's cooling canal during the 1994-95, 2004 and 2005 field surveys. These field data provide a site-specific test of the accuracy of the laboratory values commonly used as the avoidance temperature or UILT for smallmouth bass. Furthermore, because field sampling in the Station's cooling canal occurred at Monitoring Stations both upstream and downstream from the operating PSMs, there is an expected gradient or differential of 2°F to 4°F between these two Monitoring Stations due to the cooling effects of the PSMs (Normandeau 2007), thus allowing *in situ* resolution of the threshold values for the avoidance temperature or UILT on each sampling date representing the varying temperature gradient throughout the season. If smallmouth bass were caught in an area where the observed water temperature at the time of capture was in excess of the literature value for the avoidance temperature or UILT, then these observations provide compelling evidence that the literature temperature values are conservatively underestimated, and that the observed thermal limits should be applied. Similarly, if smallmouth bass were not observed in the area at water temperatures equal to or above the literature values for the avoidance temperature or UILT, then the literature values for smallmouth bass avoidance temperature and UILT should be adjusted downward to match the empirical observations. Field observations revealed that smallmouth bass were caught in the cooling canal at a measured water temperature as high as 93.2°F for electrofishing samples and 100.4°F in trap net samples (Table 5-10). Therefore, both the laboratory-derived avoidance temperature and UILT are clearly conservatively underestimated for smallmouth bass in Hooksett Pool. Using either the literature-reported UILT and avoidance temperature or the field-derived equivalents from the Station's cooling canal, river water temperatures within Hooksett Pool do not exceed the UILT or avoidance temperature values for smallmouth bass.

With respect to the indicator thermal effects parameters for smallmouth bass springtime activities, the mid-range of the reported spawning temperature is 63ºF, and the mid-to upper incubation temperature for egg and larval development is 70ºF (Appendix C). Through visual inspection of the cross-sectional contours of the thermal plume, it was determined that during the spring season, temperatures did not exceed 63ºF within Hooksett Pool on 11 May or within upper Amoskeag Pool on 11 May and 24 May. Within upper Hooksett Pool, ambient thermal conditions exceeded the midpoint of the preferred temperature range (63ºF) for spawning during the 9 June 1995 survey date. As would be expected given the thermal conditions in upper Hooksett Pool, 100% of the available habitat in lower Hooksett Pool and upper Amoskeag Pool was in excess of 63ºF during the early June sampling event. This is consistent with the New Hampshire spawning period of late April through early June reported by Scarola (1987). Within lower Hooksett Pool, temperatures exceeded the midpoint of the preferred temperature range for spawning at Monitoring Stations S0 and S4 on 24 May 1995. Preferred spawning temperatures were exceeded within the upper three feet of the water column along the west bank of the river at Monitoring Station S0 and within the upper foot of the water column at Monitoring Station S4, representing 4.5% of the available habitat in lower Hooksett Pool (also representing 2.5% of the total Hooksett Pool habitat). Smallmouth bass spawning activity is associated with nest building at the river bottom, which is typically not influenced by the Station's thermal plume.

The mid to upper incubation temperature for favorable hatching success of 70ºF was not exceeded within Hooksett Pool or upper Amoskeag Pool during the 11 May and 24 May sampling events. Within lower Hooksett Pool, the favorable hatching temperature was exceeded during the 9 June 1995 event at Monitoring Stations S0 through S24, representing 49.5% of the available habitat in lower Hooksett Pool and comprising 27.6% of the total Hooksett Pool habitat. Temperatures greater than 70ºF were limited to the upper nine feet of the water column at S20, the upper eight feet at S16, the upper five feet at S24, the upper four feet at S12 and the upper three feet at S0, S4, and S8. Temperatures in upper Amoskeag Pool during the 9 June 1995 survey exceeding 70ºF represented

100% of the available habitat. However, as the reported range of spawning for smallmouth bass in New Hampshire waters is late-April through early June and eggs will hatch in two to ten days, eggs should be through the period of greatest temperature vulnerability by mid June. Smallmouth bass young should be nearing the end of their period of parental protection two to three weeks after hatching.

Reported year-round indicator thermal effect parameters for smallmouth bass are an optimum temperature for growth of 90°F and their preferred temperature of 81°F. The smallmouth bass optimum temperature for growth (90°F) was not exceeded during any of the seven temperature recording events during the spring and fall of 1995 or the two temperature recording events during the summer of 1978. The preferred temperature for smallmouth bass (81°F) was not exceeded during seven of the nine temperature recording events (11 May, 24 May, 9 June, 11 July, 8 August, 27 September, 11 October). The preferred temperature for smallmouth bass was exceeded in lower Hooksett Pool at Monitoring Stations S0, S4, S8, S12 and S16 on 21 June 1995, and at Monitoring Stations S0, S4, and S8 on 14 September 1995. On 21 June 1995, the preferred temperature was exceeded within 13.6% of the available habitat in lower Hooksett Pool (also comprising 7.6% of the total Hooksett Pool habitat). Temperature exceedences at the cooling canal discharge (S0) ranged from the upper foot of the water column along the western bank to the upper four feet of the water column on the east bank, with a total water column depth of six feet on the west to 12 feet on the east; exceedences of the preferred temperature at Monitoring Stations S8, S12 and S16 occurred within the upper foot of the water column. On 14 September 1995, the preferred temperature for smallmouth bass was exceeded within 12.4% of the available habitat in lower Hooksett (also comprising 6.9% of the total Hooksett Pool habitat). Temperature exceedences were limited to the upper three feet of the water column at Monitoring Stations S0 and S4 and the upper two feet of the mid-east channel at Monitoring Station S8 in lower Hooksett Pool.

5.5 Largemouth Bass

Largemouth bass (*Micropterus salmoides*) is a non-native resident (non-migratory) fish species found in the river in the vicinity of the Station. Like smallmouth bass, they were introduced into New Hampshire waters during the 1860's (Scarola 1987). The native range for this species included the fresh waters of the lower Great Lakes, the central part of the Mississippi River system to the Gulf Coast, Florida, and north on the Atlantic coast to Virginia. As a result of extensive introduction, it now occurs over virtually the whole Atlantic coast from Maine to Florida (Scott and Crossman 1973). Largemouth bass inhabit marshes, swamps, ponds, lakes, reservoirs, and large rivers (Jenkins and Burkhead 1993). They are often found in warm water at depths of less than 20 ft. in association with soft bottoms, stumps, and extensive growths of a variety of emergent and sub-emergent vegetation (Scott and Crossman 1973).

Largemouth bass represent the lentic piscivore trophic guild of fish species that are reported to be intermediate in their tolerance to pollution (Table 3-15). Some researchers consider largemouth bass to be insectivorous and tolerant to pollution (Table 3-15). This alternate trophic guild applies to early life stages that primarily feed on plankton and small insects (Jenkins and Burkhead 1993).

As a RIS, largemouth bass also represent other non-RIS lentic piscivores with intermediate tolerance found in the Hooksett Pool fish community, including white perch, American eel, brown trout, chain pickerel, rock bass and black crappie (Table 3-15). Therefore, conclusions about the interaction of largemouth bass with the Station's thermal discharge can be applied to other members of the fish community within the same trophic guild and tolerance classification (USEPA 1977).

In August and September of all years with consistent sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), the period of comparable and documented electrofish sampling in Hooksett Pool, juvenile and adult largemouth bass have been numerically important components of the river fish community sampled by electrofishing. They are found throughout Hooksett Pool including habitats exposed to the thermal discharge. Largemouth bass were 8.8% of the overall electrofishing catch in 1972, 2.3% in 1973, 12.5% in 1974, 6.7% in 1976, 4.5% in 1995, 20.0% in 2004 and 27.4% in 2005. Relative abundance was greatest for largemouth bass during 2005 (29.9%) and lowest during 1995 (1.8%) among the seven years sampled in Ambient Hooksett Pool. Largemouth bass ranged in relative abundance from a high of 39.7% in 2004 to a low of 2.1% in 1973 in the Thermally-influenced zone of Hooksett Pool.

The annual total catch rate (i.e., total catch per unit effort or CPUE of fish per 1000-ft electrofishing transect) of largemouth bass in August and September (combined) of 1972 through 2005, the period of comparable and documented electrofishing effort for fish monitoring in Hooksett Pool (Table 3-7), was highest in 2004 (CPUE = 9.6 fish) and lowest in 1973 (CPUE = 0.9 fish). When the total catch rate was partitioned into Ambient Hooksett Pool and the Thermally-influenced zone of Hooksett Pool, the annual catch rate within Ambient Hooksett Pool ranged from a high CPUE of 10.6 fish in 2004 to a low of 0.9 fish in 1973. The annual catch rate in the Thermally-influenced zone of Hooksett Pool peaked in 1973 (CPUE = 5.8 fish) and was lowest during 1972 (CPUE = 1.0 fish).

No statistically significant negative (decreasing) trends were observed in largemouth bass annual mean CPUE comparable August and September time period of electrofish sampling in Hooksett Pool, supporting a finding of "no prior appreciable harm" due to the Merrimack Station's thermal discharge during this four-decade period. The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of 0.428 with a probability level of p=0.177 (Figure 3-4). The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's Tau b of 0.333 with a probability level of p=0.293 and from the Thermally-influenced zone of Hooksett Pool, a Kendall's Tau b of 0.333 with a probability level of p=0.293.

The UILT representing the selected maximum temperature permissible for summer survival of largemouth bass is reported to be 95ºF (minimum of the reported range), and the thermal avoidance temperature 90ºF (conservative value; Appendix C). The 90ºF value was selected even though EPA would allow the use of 94.5ºF, which is the reported value toward the mid-range of the available avoidance temperatures. The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool, the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature), and the four indicator thermal effects parameters (optimum growth, preferred, spawning and early life history temperatures) for largemouth bass are summarized in Table 5-11. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for largemouth bass in Hooksett Pool is summarized in Table 4-1. As a resident species, largemouth bass will utilize habitat within Hooksett Pool throughout the year and as a result, thermal exceedances of UILT, avoidance, optimum growth and preferred temperature limits should be examined for that entire time period. Spawning and life history thermal requirements need only be examined from late-April to early-June when largemouth bass in NH are known to be actively spawning (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT and avoidance temperatures for largemouth bass was not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 1 April to 1 November period (Table 5-12). Examination of the frequency of occurrence of water temperatures data revealed that the UILT and avoidance temperatures for largemouth bass would not be exceeded under median river flow and ambient water temperature conditions (with a probability of occurrence of one year out of every four years) throughout Hooksett Pool and in upper Amoskeag Pool, and would not be exceeded during rare or extreme conditions of low river flow and high ambient water temperatures (with a probability of occurrence of one year out of every 100 years) (Table 5-3). Only in the artificial habitat found within the man-made structure of Merrimack Station's cooling canal under summer conditions of low flow and warm ambient conditions are water temperatures predicted to exceed the UILT temperature (67 days for the extreme case and 14 days for the median case) or the avoidance temperature (102 days for the extreme case and 81 days for the median case) for largemouth bass (Table 5-3).

The presence or absence of largemouth bass and the corresponding measured water temperatures at the time of sampling were used as an *in situ* assay of literature values for largemouth bass avoidance temperature and UILT derived from laboratory studies, by examining the electrofishing and trapnet data collected in the Station's cooling canal during the 1994-95, 2004 and 2005 field surveys. These field data provide a site-specific test of the accuracy of the laboratory values commonly used as the avoidance temperature or UILT for largemouth bass. Furthermore, because field sampling in the Station's cooling canal occurred at Monitoring Stations both upstream and downstream from the operating PSMs, there is an expected gradient or differential of 2°F to 4°F between these two Monitoring Stations due to the cooling effects of the PSMs (Normandeau 2007), thus allowing *in situ* resolution of the threshold values for the avoidance temperature or UILT on each sampling date representing the varying temperature gradient throughout the season. If largemouth bass were caught in an area where the observed water temperature at the time of capture was in excess of the literature value for the avoidance temperature or UILT, then these observations provide compelling evidence that the literature temperature values are conservatively underestimated, and that the observed thermal limits should be applied. Similarly, if largemouth bass were not observed in the area at water temperatures equal to or above the literature values for the avoidance temperature or UILT, then the literature values for largemouth bass avoidance temperature and UILT should be adjusted downward to match the empirical observations. For largemouth bass caught in the Station's cooling canal, the literature-reported UILT value is 95°F and the avoidance temperature is 90°F (Appendix C). However, field observations revealed that largemouth bass were caught in the cooling canal at a measured water temperature as high as 93.2°F for electrofishing samples (Table 5-10). Therefore, the laboratory-derived avoidance temperature is clearly conservatively underestimated for largemouth bass in Hooksett Pool. Increasing the avoidance temperature for largemouth bass from the literature-reported avoidance value of 90°F to the field observed value of 93°F (which is still lower than the reported mid-range value of 94.5°F) would reduce the number of days during the summer season when the mean river water temperature, as measured at the cooling canal discharge (S0), would exceed the avoidance temperature.

With respect to the indicator thermal effects parameters for largemouth bass springtime activities, the reported optimal spawning temperature is 70°F, and the mid-to upper incubation temperature for egg and larval development is 75°F (Appendix C). Through visual inspection of the cross-sectional contours of the thermal plume, it was determined that during the spring season, temperatures did not exceed 70°F within Hooksett Pool or upper Amoskeag Pool on 11 May and 24 May. Within lower

Hooksett Pool, river water temperatures exceeded the optimal spawning temperature at Monitoring Stations S0 through S24 during the survey date of 9 June 1995, comprising 49.5% of the available habitat in lower Hooksett Pool (also comprising 27.6% of the total Hooksett Pool habitat). Temperatures greater than 70°F were limited to the upper nine feet of the water column at S20, the upper eight feet at S16, the upper five feet at S24, the upper four feet at S12 and the upper three feet at S0, S4, and S8. This is consistent with the reported New Hampshire spawning period of late April through early June (Scarola 1987) and suggests that largemouth bass spawning is likely to occur prior to June of each year in Hooksett Pool. Springtime temperatures in upper Amoskeag Pool reached levels greater than the midpoint of the preferred temperature range for spawning largemouth bass on 9 June 1995 These exceedances represented 100% of the available habitat in upper Amoskeag Pool.

The mid to upper incubation temperature for favorable hatching success of 75°F was not exceeded during any of the three spring sampling dates within upper Hooksett Pool or Amoskeag Pool (11 May, 24 May, 9 June). Within lower Hooksett Pool, the favorable hatching temperature for largemouth bass eggs was exceeded during the 9 June 1995 event at the end of the discharge canal (S0) within the upper two feet of the water column. The volume of river water above 75°F represented 1.4% of the available habitat in lower Hooksett Pool (also represented 0.8% of and the total Hooksett Pool habitat).

Reported year-round indicator thermal effect parameters for largemouth bass are an optimum temperature for growth of 83°F and a preferred temperature of 86°F. The optimum growth temperature for largemouth bass was not exceeded within upper or lower Hooksett Pool or upper Amoskeag Pool during seven of the nine survey dates (11 May, 24 May, 9 June, 11 July, 8 August, 27 September, 11 October). Water temperatures in excess of 83°F represented 4.7% of the available habitat in lower Hooksett Pool (also comprising 2.6% of total Hooksett Pool habitat) and occurred within the upper four feet of the water column at Monitoring Station S0 and in the upper foot of the water column at Monitoring Station S4 on 21 June 1995. During 14 September 1995 the optimum growth temperature for largemouth bass was exceeded within the upper three feet of the water column at S0 and represented 1.8% of the available habitat in lower Hooksett Pool (also comprising 1.0% of the total Hooksett Pool habitat). During the four spring, two summer and three fall sampling events, the preferred temperature for largemouth bass (86°F) was exceeded once, at Monitoring Station S0, on 21 June 1995. This exceedence occurred within the top foot of the water column and comprised 0.2% of the available habitat in lower Hooksett Pool (0.1% of total Hooksett Pool habitat).

5.6 PUMPKINSEED

Pumpkinseed (*Lepomis gibbosus*) is a native, resident fish species found in the river in the vicinity of the Station (Scarola 1987). The native range for this species included the fresh waters of eastern North America. Along the Atlantic seaboard, it occurs from New Brunswick south to Georgia. Pumpkinseed have been widely introduced and as a result now occur in many areas west of their original range (Scott and Crossman 1973). Similar in habitat preference to the bluegill, pumpkinseed prefer quiet or slow-moving water and are particularly abundant in areas of dense aquatic vegetation (Scarola 1987).

Pumpkinseed represent the insectivore trophic guild of fish species that are reported to be intermediate in their tolerance to pollution (Table 3-15). Pumpkinseed feed on microcrustaceans and small aquatic insects. In some environments, they will feed extensively on snails and small clams (Jenkins and Burkhead 1994).

Pumpkinseed shares the same habitat, trophic guild and pollution tolerance classification as one other Station RIS, the yellow perch (Table 3-15). As a RIS, pumpkinseed also represents other non-RIS lentic insectivores with intermediate tolerance found in the Hooksett Pool fish community, including the closely-related tessellated darter, three minnow species (emerald shiner, common shiner and spottail shiner), three catfish species (brown bullhead, yellow bullhead, and margined madtom) and two centrarchids (redbreast sunfish and bluegill; Table 3-15). Therefore, conclusions about the interaction of pumpkinseed with the Station's thermal discharge can be applied to these other members of the fish community within the same trophic guild and tolerance classification.

Pumpkinseed have been present during all years of the comparable August and September time period of electrofish sampling in Hooksett Pool (1972, 1973, 1974, 1976, 1995, 2004 and 2005). In Hooksett Pool, all zones combined, pumpkinseed comprised 58.8% of the total catch during 1972, 55.7% in 1973, 48.4% in 1974, 48.9% in 1976, 0.7% in 1995, 1.5% in 2004 and 4.0% in 2005. In Ambient Hooksett Pool, relative abundance has ranged from a high of 52.3% in 1973 to a low of 0% in 1995. Relative abundance in the Thermally-influenced zone of Hooksett Pool has ranged from a high of 66.5% in 1972 to a low of 1.5% in 1995.

The annual total catch rate (i.e., total catch per unit effort or CPUE of fish per 1000-ft electrofishing transect) of pumpkinseed in August and September (combined) of 1972 through 2005, the period of comparable and documented electrofishing effort for fish monitoring in Hooksett Pool (Table 3-7), was highest in 1972 (37.6 fish), followed by 1974 (25.4 fish). Pumpkinseed CPUE was at its lowest in 1995 (0.7 fish). Ambient zone annual catch rates for pumpkinseed ranged from a high of 31.9 fish in 1972 to a low of 0 fish in 1995. The annual catch rate of pumpkinseed by electrofishing within the Thermally-influenced zone of Hooksett Pool was highest during 1972 (43.4 fish) and lowest during 2004 (1.0 fish).

Statistically significant negative (decreasing) trends were observed in pumpkinseed annual mean CPUE comparable August and September time period of electrofish sampling in Hooksett Pool (Figure 3-5). The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of -0.809 with a probability level of p=0.011 (Figure 3-5). The electrofishing time series from ambeint Hooksett Pool exhibited a Kendall's Tau b of -0.619 with a probability level of p=0.051 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of -0.714 with a probability level of p=0.024. Introductions of bluegill (early 1980's), rock bass (first detected in 1995) and black crappie (first detected in 2004) have provided competition for the niche previously filled by pumpkinseed. These three species, with bluegill in particular, will compete directly with pumpkinseed for available food resources within Hooksett Pool, and their combined abundance exhibits a significant ($r^2 = -0.777$, $p = <.0001$) negative correlation with the abundance of pumpkinseed in Hooksett Pool, supporting this competition hypothesis.

The UILT representing the maximum temperature permissible for summer survival of pumpkinseed is reported to be 94ºF, and the thermal avoidance temperature 88ºF (Appendix C). The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool, the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature), and the four indicator thermal effects parameters (optimum growth, preferred, spawning and early life history temperatures) for pumpkinseed are summarized in

Table 5-13. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for pumpkinseed in Hooksett Pool is summarized in Table 4-1. As a resident species, pumpkinseed will utilize habitat within Hooksett Pool throughout the year and as a result, thermal exceedances of UILT, avoidance, optimum growth and preferred temperature limits should be examined for that entire time period. Spawning and life history thermal requirements need only be examined from June to early-August when pumpkinseed in NH are known to be actively spawning (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT and avoidance temperatures for pumpkinseed were not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 1 April to 1 November period (Table 5-14). Examination of the frequency of occurrence of water temperatures data revealed that the UILT and avoidance temperatures for pumpkinseed would not be exceeded under median river flow and ambient water temperature conditions (with a probability of occurrence of one year out of every four years) throughout Hooksett Pool and in upper Amoskeag Pool. During rare or extreme conditions of low river flow and high ambient water temperatures (with a probability of occurrence of one year out of every 100 years), pumpkinseed avoidance temperatures within the lower Hooksett Pool (Monitoring Station S-4) would be exceeded on 16 days (Table 5-3). The UILT for pumpkinseed would not be exceeded under extreme conditions within lower Hooksett Pool. Only in the artificial habitat found within the man-made structure of Merrimack Station's cooling canal under summer conditions of low flow and warm ambient conditions are water temperatures predicted to exceed the UILT temperature (72 days for the extreme case and 35 days for the median case) or the avoidance temperature (121 days for the extreme case and 95 days for the sverage case) for pumpkinseed (Table 5-3). This provides further evidence supporting the competition hypothesis as the reason for the historical decline in pumpkinseed abundance, and eliminating the contribution of the Station's thermal discharge to this decline during the spring and fall seasons.

The presence or absence of pumpkinseed and the corresponding measured water temperatures at the time of sampling were used as an *in situ* assay of literature values for pumpkinseed avoidance temperature and UILT derived from laboratory studies, by examining the electrofishing and trapnet data collected in the Station's cooling canal during the 1994-95, 2004 and 2005 field surveys. These field data provide a site-specific test of the accuracy of the laboratory values commonly used as the avoidance temperature or UILT for pumpkinseed. Furthermore, because field sampling in the Station's cooling canal occurred at locations both upstream and downstream from the operating PSMs, there is an expected gradient or differential of 2°F to 4°F between these two Monitoring Stations due to the cooling effects of the PSMs (Normandeau 2007), thus allowing *in situ* resolution of the threshold values for the avoidance temperature or UILT on each sampling date representing the varying temperature gradient throughout the season. If pumpkinseed were caught in an area where the observed water temperature at the time of capture was in excess of the literature value for the avoidance temperature or UILT, then these observations provide compelling evidence that the literature temperature values are conservatively underestimated, and that the observed thermal limits should be applied. Similarly, if largemouth bass are not observed in the area at water temperatures equal to or above the literature values for the avoidance temperature or UILT, then the literature values for pumpkinseed avoidance temperature and UILT should be adjusted downward to match the empirical observations. For pumpkinseed caught in the Station's cooling canal, the literature-reported UILT value is 94°F and the avoidance temperature is 88°F (Table 5-10). However, field observations revealed that pumpkinseed were caught in the cooling canal at a measured water temperature as high as 89.6°F for electrofishing samples (Table 5-12) and 93.2°F for trapnet samples. Therefore, the laboratory-derived avoidance temperature is clearly conservatively underestimated for pumpkinseed in Hooksett Pool. Increasing the avoidance temperature for pumpkinseed from the literature-reported avoidance value of 88°F to the field-observed value of 93°F (Table 5-10) would reduce the number of days during the summer season when the mean temperature, as measured at the cooling canal discharge (S0), would exceed the avoidance temperature.

With respect to the indicator thermal effects parameters for pumpkinseed springtime activities, the reported spawning temperature is 67°F, and the approximate midpoint for peak hatching temperatures and larval development is 71°F (Appendix C). Through visual inspection of the cross-sectional contours of the thermal plume, it was determined that during the spring season, temperatures did not exceed 67°F within Hooksett Pool or upper Amoskeag Pool on 11 May and 24 May. It was determined that within upper Hooksett Pool, river water temperatures were equal to or exceeded the reported spawning temperature (67°F) during the last two spring survey dates of 9 June 1995 and 21 June 1995 and both summer events (11 July and 8 August 1978). As would be expected given the thermal conditions in upper Hooksett Pool, 100% of the available habitat in lower Hooksett Pool and upper Amoskeag Pool was in excess of 67°F during the 9 June, 21 June, 11 July and 8 August sampling events. Within lower Hooksett Pool, river water temperatures exceeded the midpoint of the preferred temperature range for pumpkinseed spawning on 24 May 1995 within the upper two feet of the water column at the end of the discharge canal (S0), representing 0.2% of the available habitat in lower Hooksett Pool. The reported spawning period for pumpkinseed in New Hampshire waters is from early-June through August (Scarola 1987). The reported spawning period for bluegill spans a longer period of time than the sunfish species native to New Hampshire (Scarola 1987). A female bluegill can on average lay more than four times the number of eggs produced by a female pumpkinseed and a male bluegill may raise up to two or three broods per season (Scarola 1987). In addition to being more prolific spawners, the larger bodied bluegill will also compete with the pumpkinseed for spawning habitat, as both prefer to nest in gravelly substrate in shallow areas.

The mid to upper incubation temperature for favorable hatching success of 71°F was not exceeded within Hooksett Pool or upper Amoskeag Pool during the May 11 and May 24 sampling dates. The favorable hatching temperature was exceeded within upper Hooksett Pool during the 21 June 1995 field survey. As would be expected given the thermal conditions in upper Hooksett Pool, 100% of the available habitat in lower Hooksett Pool and upper Amoskeag Pool was in excess of 71°F during the 21 June sampling event. The favorable hatching temperature for pumpkinseed eggs was exceeded during the 9 June 1995 survey throughout lower Hooksett Pool (S0 through S24). On 9 June 1995, thermal conditions were in excess of 71°F within 20.0% of the available habitat within lower Hooksett Pool (also representing approximately 11.2% of the total Hooksett Pool habitat). Water volume in upper Amoskeag Pool in excess of pumpkinseed hatching temperatures comprised 33.8% of the upper Amoskeag Pool habitat on 9 June 1995.

Reported year-round indicator thermal effect parameters for pumpkinseed are an optimum temperature for growth and a preferred temperature of 86°F (Appendix C). Optimum growth and preferred temperatures for pumpkinseed were not exceeded within upper Hooksett Pool or upper Amoskeag Pool during any of the nine sampling dates and within lower Hooksett Pool during eight of the nine temperature sampling dates during the 1995 and 1978 Thermal Studies. The pumpkinseed optimum for growth and preferred temperatures were exceeded within lower Hooksett Pool during the 21 June 1995 survey, when temperatures greater than 86°F were observed within the upper foot of the water column at Monitoring Station S0. The volume of river water above 86°F represented 0.2% of the available habitat in lower Hooksett Pool (also comprised 0.1% of total Hooksett Pool habitat).

5.7 YELLOW PERCH

Yellow perch (*Perca flavescens*) is a native, resident fish species in the Merrimack River that has a circumpolar distribution in fresh waters of the northern hemisphere (Scott and Crossman 1973). Within North America, yellow perch are widespread and very adaptable. They are found in a variety of warm- to cool-water habitats, and have historically occupied a range from Nova Scotia to South Carolina along the east coast, extending northwesterly through the Great Lakes states into Alberta, Canada. Yellow perch has been successfully introduced into nearly all states west and south of its historical range (Scott and Crossman 1973). They are often common in clear open water habitats with moderate vegetation, typically less than 30 feet deep (Lee et al. 1980).

Yellow perch represents the lentic insectivore trophic guild of fish species that are reported to be intermediate in their tolerance to pollution (Table 3-15). Some researchers consider yellow perch to be piscivorous or a generalist forager (Table 3-15); however, these alternate trophic guilds undoubtedly apply to different age classes, with general foraging occurring in the earlier life stages, a predominance of piscivory in the older and larger individuals, and insectivory occurring throughout their life.

Yellow perch shares the same habitat, trophic guild and pollution tolerance classification as one other Hooksett Pool RIS, the pumpkinseed (Table 3-15). As a RIS, yellow perch also represents other non-RIS lentic insectivores with intermediate tolerance found in the Hooksett Pool fish community, including the closely-related tessellated darter, three minnow species (emerald shiner, common shiner and spottail shiner), three catfish species (brown bullhead, yellow bullhead, and margined madtom) and three centrarchids (redbreast sunfish, pumpkinseed sunfish and bluegill; Table 3-15). Therefore, conclusions about the interaction of yellow perch with the Station's thermal discharge can be applied to other members of the fish community within the same trophic guild and tolerance classification (USEPA 1977).

In August and September of all years with consistent sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), the period of comparable and documented electrofish sampling in Hooksett Pool, juvenile and adult yellow perch have been numerically important components of the river fish community as sampled by electrofishing. They are found throughout Hooksett Pool, including habitats exposed to the thermal discharge. Yellow perch were 13.0% of the catch in 1972, 15.2% in 1973, 7.5% in 1974, 2.6% in 1976, 0.2% in 1995, 1.4% in 2004 and 11.7% in 2005. Relative abundance of yellow perch in Ambient Hooksett Pool was greatest during 1973 (21.7%), followed by 1972 (20.4%) and 2005 (18.2%). Yellow perch relative abundance was lowest during 1995 (0.1%). Yellow perch relative abundance within the Thermally-influenced zone of Hooksett Pool ranged from highs of 11.6% in 1973 and 5.8% in 1974 to a low of 0.2% in 1995.

The annual total catch rate (i.e., total catch per unit effort or CPUE of fish per 1000-ft electrofishing transect) of yellow perch in August and September (combined) of 1972 through 2005, the period of comparable and documented electrofishing effort for fish monitoring in Hooksett Pool (Table 3-7), was highest in 1972 (8.3 fish), followed by 1973 (5.5 fish). Yellow perch CPUE was at its lowest in 1995 (0.2 fish). Ambeint zone annual catch rates for yellow perch ranged from a high of 12.8 fish in 1972 to a low of 0.25 fish in 1995. The annual catch rate of yellow perch by electrofishing within the

Thermally-influenced zone of Hooksett Pool was highest during 1974 (5.0 fish) and lowest during 1995 (0.2 fish).

No statistically significant negative (decreasing) trends were observed in yellow perch annual mean CPUE comparable August and September time period of electrofish sampling in Hooksett Pool, supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge during this four-decade period (Figure 3-6). The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of -0.619 with a probability level of p=0.051 (Figure 3-6). The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's Tau b of -0.428 with a probability level of p=0.177, and for the Thermally-influenced zone of Hooksett Pool, the Kendall's Tau b was -0.428 with a probability level of p=0.177.

The UILT representing the maximum temperature permissible for summer survival of yellow perch is reported to be 90°F, and the thermal avoidance temperature 83°F (Appendix C). This 83°F temperature is the reported value at the mid-point of the range of available avoidance temperatures for this species. In addition, it is the lowest of such mid-range avoidance temperature values for any of the resident Station RIS, making it, under EPA's approach, the critical avoidance temperature for resident fish in Hooksett Pool and upper Amoskeag Pool, i.e., making yellow perch the "most sensitive" resident species and therefore making this reported temperature value the "critical threshold temperature" for resident species. The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool, the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature), and the four indicator thermal effects parameters (optimum growth, preferred, spawning and early life history temperatures) for yellow perch are summarized in Table 5-15. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for yellow perch in Hooksett Pool is summarized in Table 4-1. As a resident species, yellow perch will utilize habitat within Hooksett Pool throughout the year and as a result, thermal exceedances of UILT, avoidance, optimum growth and preferred temperature limits should be examined for that entire time period. Spawning and life history thermal requirements need only be examined from April to early-May when yellow perch in NH are known to be actively spawning (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT for yellow perch was not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 1 April to 1 November period (Table 5-16). Examination of the frequency of occurrence of water temperatures data revealed that the UILT temperature for yellow perch would not be exceeded under median river flow and ambient water temperature conditions (with a probability of occurrence of one year out of every four years) throughout Hooksett Pool and in upper Amoskeag Pool, and would not be exceeded during rare or extreme conditions of low river flow and high ambient water temperatures (with a probability of occurrence of one year out of every 100 years) (Table 5-3). Only in the artificial habitat found within the man-made structure of Merrimack Station's cooling canal under summer conditions of low flow and warm ambient conditions are water temperatures predicted to exceed the UILT temperature for yellow perch (102 days for the extreme case and 81 days for the median case; Table 5-3).

The upper mid-range avoidance temperature of 83°F for yellow perch was not exceeded within upper Hooksett Pool or upper Amoskeag Pool during any of the spring, summer, or fall sampling events. Within lower Hooksett Pool, the avoidance temperature was not exceeded during seven of the nine sampling events. On 21 June 1995, temperatures in excess of 83°F were recorded at Monitoring

Stations S0 and S4. River water temperatures that exceeded yellow perch avoidance limits occurred within 4.7% of the habitat available in lower Hooksett Pool (also comprising 2.6% of total Hooksett Pool habitat). This volume of water was limited to the upper four feet of the water column at S0 and the upper foot of the water column at Monitoring Station S4. Temperatures greater than 83°F on 14 September 1995 represented 1.8% of habitat available in lower Hooksett Pool (comprising 1.0% of available Hooksett Pool habitat) and were limited to the upper 3 feet of the water column at S0.

With respect to the indicator thermal effects parameters for yellow perch springtime activities, the lower mid-range of the reported spawning temperatures is 50°F, and the mid-to upper incubation temperature for egg and larval development is 65°F (Appendix C). Water temperatures in excess of the preferred spawning temperature for yellow perch occurred within 100% of the available habitat in upper and lower Hooksett Pool and upper Amoskeag Pool during the spring survey date (11 May). Therefore, it is clear that yellow perch will spawn prior to May in Hooksett Pool, consistent with an April to early May spawning period reported for New Hampshire (Scarola 1987). The mid to upper incubation temperature for favorable hatching success of yellow perch eggs is 65°F (Appendix C) and was not exceeded within upper Hooksett Pool or upper Amoskeag Pool during the 11 May sampling event.

Reported year-round indicator thermal effect parameters for yellow perch are an optimum temperature for growth of 74°F and a preferred temperature of 77°F (Appendix C). The yellow perch optimum growth temperature (74°F) was not exceeded within Hooksett Pool or upper Amoskeag Pool during four of the nine surveys (11 May, 24 May, 27 September, 11 October). During the four spring season survey dates, water temperatures were in excess of 74°F within upper Hooksett Pool during the last event (21 June 1995). As would be expected, given the natural temperature exceedance occurring in upper Hooksett Pool, the thermal conditions of habitat available in lower Hooksett Pool (94.5%) and upper Amoskeag Pool (100%) were also greater than 74°F. On 9 June 1995, 5.9% of the available habitat in lower Hooksett Pool (3.3% of the total Hooksett Pool habitat) had water temperatures greater than 74°F. These excessive water temperatures were limited to the upper foot of the water column at S0 and S4 and to the surface waters at S8. During the two summer surveys, water temperatures in excess of 74°F were present within upper Hooksett Pool and throughout 100% of the available habitat in lower Hooksett Pool during the 11 July 1978 survey and throughout 97.6% of the available habitat in lower Hooksett Pool (also comprising 54.5% of the total Hooksett Pool habitat) during the 8 August 1978 survey. The yellow perch optimum growth temperature was exceeded during the first fall thermal plume survey (14 September 1995) in the upper Hooksett Pool at Monitoring Station N5, and in lower Hooksett Pool at Monitoring Stations S0 through S20. Water temperatures in excess of 74°F, comprised 46.7% of habitat available in lower Hooksett Pool during the 14 September 1995 sampling event.

Within upper Hooksett Pool, the preferred temperature for yellow perch (77°F) was not exceeded during eight of the nine thermal surveys (14 September being the exception). Within lower Hooksett Pool, the yellow perch preferred temperature was exceeded during the 9 June 1995 event within the top foot of the water column at the end of the cooling canal (Monitoring Station S0). The volume of river water above 77°F represented 0.2% of habitat available in lower Hooksett Pool. During the 21 June 1995 sampling event, river water temperatures in lower Hooksett Pool exceeded the preferred temperature for yellow perch at all Monitoring Stations and represented 50.9% of available habitat in lower Hooksett Pool (also comprising 28.4% of the total Hooksett Pool habitat). A total of 97.3% of the available habitat in upper Amoskeag Pool was greater than 77°F during the 21 June 1995 survey.

During the summer period, the preferred temperature for yellow perch was exceeded at Monitoring Stations S0-S24, comprising 71.3% of the available habitat in lower Hooksett Pool (also comprising 39.8% of total Hooksett Pool habitat) during the 11 July 1978 survey. The preferred temperature for yellow perch was exceeded at Monitoring Stations S0-S2 and S9-S24, representing 20.9% of the available habitat in lower Hooksett Pool (also comprising 11.7% of total Hooksett Pool habitat) during the 8 August 1978 survey. The preferred river water temperature for yellow perch (77°F) was exceeded during the 14 September 1995 plume survey at Monitoring Station N5 in upper Hooksett Pool and Monitoring Stations S0 through S12 in lower Hooksett Pool and water temperatures greater than 77°F represented 31.1% of the available habitat in lower Hooksett Pool. On that date, excessive temperatures were limited to the upper three feet of the water column at S0 and the upper four feet of the water column at Monitoring Stations S4, S8 and S12.

5.8 FALLFISH

Fallfish (*Semotilus corporalis*)) is a native, resident fish species in the river that is reported to inhabit clear streams and lakes from New Brunswick, Canada, south along the East Coast of the United States to Virginia with the western limits being the Appalachian Mountains. Fallfish are common in the tributaries of the St. Lawrence River in Quebec and found along the northern shore of Lake Ontario (Scott and Crossman 1973). Fallfish is one of the most common minnow species in New Hampshire rivers (Scarola 1987). Adult fallfish inhabit clear, flowing, gravel-bottomed streams and lakes, while the young prefer more rapid water upstream. Larger adults have been noted to inhabit large pools and deeper runs in rivers (Scott and Crossman 1973).

Fallfish represents the lotic generalist trophic guild of fish species that are reported to be intermediate in their tolerance to pollution (Table 3-15). Fallfish are opportunistic feeders, eating aquatic insect larvae, terrestrial insects, crustaceans, and fish (Scott and Crossman 1973). Fallfish represent other generalist fish species that have an intermediate pollution tolerance and are present in lotic habitat in the Station study area, including common shiner, spottail shiner, yellow bullhead and white sucker.

In August and September of all years with consistent sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), the period of comparable and documented electrofish sampling in Hooksett Pool, fallfish were present in low abundance during six of the seven years sampled. Fallfish represented 2.7% of the overall electrofishing catch in 1972, 1.4% in 1973, 0.1% in 1974, 0% in 1976, 0.3% in 1995, 3.0% in 2004 and 5.8% in 2005. Within ambeint Hooksett Pool, fallfish relative abundance was greatest during 2005 (10.0%) and lowest during 1976 (0%) among the seven years sampled. Relative abundance of fallfish within the Thermally-influenced zone of Hooksett Pool ranged from a high of 1.4% in 2005 to a low of 0.3% in 1973. Fallfish were present in the Thermally-influenced zone of Hooksett Pool only during 1973, 2004 and 2005.

The annual total catch rate (i.e., total catch per unit effort or CPUE of fish per 1000-ft electrofishing transect) of fallfish in August and September (combined) of 1972 through 2005, the period of comparable and documented electrofishing effort for fish monitoring in Hooksett Pool (Table 3-7), was highest in 1972 (CPUE = 1.7 fish) and lowest in 1976 when no fallfish were captured. The annual catch rate within Ambient Hooksett Pool ranged from a high CPUE of 3.4 fish in 1972 to a low of 0 fish in 1976. Fallfish were present within the Thermally-influenced zone of Hooksett Pool during 1973, 2004 and 2005; the highest CPUE was recorded in 2004 (0.3 fish).

No statistically significant negative (decreasing) trends were observed in fallfish annual mean CPUE comparable August and September time period of electrofish sampling in Hooksett Pool, supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge during this four-decade period (Figure 3-7). The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau of -0.048 with a probability level of p=0.881. The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's Tau b of 0.000 with a probability level of p=1.000 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of 0.394 with a probability level of p=0.242.

The UILT representing the maximum temperature permissible for summer survival of fallfish is reported to be 90ºF, and the thermal avoidance temperature 82ºF (Appendix C). The 82ºF value is the only avoidance temperature value reported in the literature for fallfish. In addition, this value is not considered the "critical threshold temperature" for resident species in the receiving water because of the low presence of this species there, and the fact that fallfish is not a formally approved RIS. The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool, the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature), and three indicator thermal effects parameters (optimum growth, spawning and early life history temperatures) for fallfish are summarized in Table 5-17. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for fallfish in Hooksett Pool is summarized in Table 4-1. As a resident species, fallfish will utilize habitat within Hooksett Pool throughout the year and as a result, thermal exceedances of UILT, avoidance, optimum growth and preferred temperature limits should be examined for that entire time period. Spawning and life history thermal requirements need only be examined during May when fallfish in NH are known to be actively spawning (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT for fallfish was not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 1 April to 1 November period (Table 5-18). Examination of the frequency of occurrence of water temperatures data revealed that the UILT temperature for fallfish would not be exceeded under median river flow and ambient water temperature conditions (with a probability of occurrence of one year out of every four years) throughout Hooksett Pool and in upper Amoskeag Pool, and would not be exceeded during rare or extreme conditions of low river flow and high ambient water temperatures (with a probability of occurrence of one year out of every 100 years) (Table 5-3). Only in the artificial habitat found within the man-made structure of Merrimack Station's cooling canal under summer conditions of low flow and warm ambient conditions are water temperatures predicted to exceed the UILT temperature for fallfish (102 days for the extreme case and 81 days for the median case; Table 5-3).

The avoidance temperature for fallfish (82ºF) was not exceeded during eight of the nine sampling events within upper Hooksett Pool or any of the sampling events within upper Amoskeag Pool. Within lower Hooksett Pool, the avoidance temperature was exceeded on 21 June 1995 at Monitoring Stations S0 and S4 but was limited to the top foot to four feet of the water column at S0 and within the top foot of the water column at S4. Water temperatures in excess of the avoidance temperature for fallfish represented 7.0% of available habitat in lower Hooksett Pool (also comprising 3.9% of the total Hooksett Pool habitat). During the 14 September 1995 thermal plume survey upstream ambient conditions at Monitoring Station N5 were in excess of the avoidance temperature for fallfish within the upper foot of the water column. River water temperatures in excess of 82ºF represented 4.5% of the habitat available in lower Hooksett Pool and were limited to the end of the cooling canal (S0) within the upper three feet of the water column at S0, and in the upper foot of the water column at one transect location along the eastern side of the river at S4.

With respect to the indicator thermal effects parameters for fallfish springtime activities, the lower mid-range of the reported spawning temperatures is 60°F, and the mid-to upper incubation temperature for hatching and early larval development is 65°F (Appendix C). Through visual inspection of the cross-sectional contours of the thermal plume, it was determined that during the spring season within upper Hooksett Pool, ambient river water temperatures exceeded 60°F on the survey date of 24 May. Therefore, it is clear that fallfish will spawn prior to late May in Hooksett Pool, consistent with a May spawning period reported for New Hampshire (Scarola 1987). The warm ambient conditions were also reflected in lower Hooksett Pool and in upper Amoskeag Pool, which exhibited water temperatures above 60°F on the above date. River water temperatures did not exceed the preferred spawning temperature anywhere in upper Hooksett pool or in upper Amoskeag Pool during the 11 May 1995 survey. River water temperatures exceeded the preferred spawning temperature for fallfish within the upper foot of the water column at Monitoring Station S-0, comprising 1.3% of the available habitat in lower Hooksett Pool (also comprising 0.7% of the total Hooksett Pool habitat) during the first spring survey on 11 May 1995.

The mid to upper incubation temperature for favorable hatching success of fallfish eggs of 65°F (Appendix C) and was not exceeded within upper Hooksett Pool or upper Amoskeag Pool during the 11 May or 24 May sampling events. Within lower Hooksett Pool, the favorable hatching temperature for fallfish eggs was exceeded during the 24 May 1995 event at the end of the cooling canal (S0). This exceedence represented 1.2% of the available habitat in lower Hooksett Pool (also comprising 0.7% of the total Hooksett Pool habitat) and was limited to the upper two feet of the water column along the western bank.

Reported year-round indicator thermal effect parameters for fallfish are an optimum temperature for growth of 68°F (Appendix C). The preferred temperature for fallfish was not available from the literature. River water temperatures in Hooksett Pool, including upper Hooksett Pool, are above the preferred temperature for fallfish during much of the summer. Naturally-occurring warm summer temperatures may be a reason why fallfish are not common in Hooksett Pool. During the 21 June 1995, 11 July 1978, and 8 August 1978 surveys, 100% of the available Hooksett Pool habitat had water temperatures in excess of the optimum growth temperature for fallfish. Thermal conditions in upper Hooksett Pool were less than 68°F during the 11 May, 24 May, 9 June, 14 September, 27 September, and 11 October surveys. During the 24 May 1995 survey, the optimum temperature for fallfish growth was exceeded within lower Hooksett Pool along the surface waters at the end of the discharge canal (S0). This volume of water represented 0.01% of the available habitat in lower Hooksett Pool (comprised 0.008% of total Hooksett Pool habitat). During the 9 June 1995 survey, the optimum temperature for fallfish growth was exceeded throughout 80.7% of available habitat in lower Hooksett Pool (also comprising 45.1% of the total Hooksett Pool habitat) between Monitoring Stations S0-S24. One hundred percent of available habitat in upper Amoskeag Pool was in excess of 68°F on 9 June 1995. During the 14 September 1995 thermal survey, 82.0% of the available habitat in lower Hooksett Pool exceeded the optimum temperature for fallfish growth (comprising 45.1% of total Hooksett Pool habitat). The 14 September exceedances occurred throughout all Monitoring Stations (S0-S24) within lower Hooksett Pool. One hundred percent of available habitat in upper Amoskeag Pool was in excess of 68°F on 14 September 1995. During the 27 September 1995 survey, the optimum temperature of 68°F was exceeded in lower Hooksett Pool within the upper two feet of the water column at the end of the discharge canal (S0). This exceedence represented 0.8% of the available habitat in lower Hooksett Pool (also comprising 0.4% of total Hooksett Pool habitat). During the 11 October 1995 survey in lower Hooksett Pool, the optimum temperature of 68°F was exceeded at Monitoring Stations S0 through S8. Temperatures greater than 68°F during the 11 October 1995 survey represented 6.7% of the available habitat in lower Hooksett Pool (also comprising 3.7% of the total Hooksett Pool habitat) and were restricted to the upper three feet of the water column at Monitoring Stations S0 and S4 and the upper foot of the water column at S8.

5.9 WHITE SUCKER

White sucker (*Catostomus commersoni*) is New Hampshire's most common native, resident fish species (Scarola 1987). Its distribution is restricted to North America and occurs from Arctic basins south into upper reaches of certain Gulf slope drainages (Jenkins and Burkhead 1993, Scott and Crossman 1973). White sucker, considered a non-game fish, is generalized in habitat requirements. It populates a wide range of gradients and substrates in waters that range from clear to turbid in both lentic and lotic habitats (Jenkins and Burkhead 1993).

White sucker represents the omnivore trophic guild of fish species that are reported to be tolerant (Table 3-15). White sucker is also considered to be an insectivore or a generalist forager by some researchers (Table 3-15). This species often feeds on midge larvae, small crustaceans, clams, other invertebrates, fish eggs, algae and other plants (Jenkins and Burkhead 1993). There is a shift in the type of food consumed with increasing size. Fry begin feeding near the surface on plankton and other small invertebrates until they reach 16-18 mm in size. At that point, the mouth moves from terminal to ventral and there is a shift to bottom feeding (Scott and Crossman 1973).

In August and September of all years with consistent sampling effort (1972, 1973, 1974, 1976, 1995, 2004 and 2005), the period of comparable and documented electrofish sampling in Hooksett Pool, white sucker have been important components of the river fish community sampled by electrofishing. They are found throughout Hooksett Pool, including habitats exposed to the thermal discharge. White sucker were 2.2% of the overall electrofishing catch in 1972, 0.6% in 1973, 8.9% in 1974, 5% in 1976, 0.2% in 1995, 1.6% in 2004 and 1.8% in 2005. Relative abundance was greatest for white sucker during 1974 (24.7%) and lowest during 1995 (0.3%) among the seven years sampled in Ambient Hooksett Pool. White sucker were present in the Thermally-influenced zone of Hooksett Pool during 1972 (4 individuals), 1974 (3 individuals), 1976 (2 individuals), and 2005 (1 individual).

The annual total catch rate (i.e., total catch per unit effort or CPUE of fish per 1000-ft electrofishing transect) of white sucker in August and September (combined) of 1972 through 2005, the period of comparable and documented electrofishing effort for fish monitoring in Hooksett Pool (Table 3-7), was highest in 1974 (4.7 fish) and was at its lowest in 1973 and 1995 (0.2 fish). Ambeint zone annual catch rates for white sucker ranged from a high of 9.0 fish in 1974 to a low of 0.5 fish in 1973 and 1995. The annual catch rate of white sucker by electrofishing within the Thermally-influenced zone of Hooksett Pool was 0.4 fish in 1972, 0.3 fish in 1974, 0.3 fish in 1976, and 0.1 fish in 2005.

No statistically significant negative (decreasing) trends were observed in white sucker annual mean CPUE comparable August and September time period of electrofish sampling in Hooksett Pool, supporting a finding of "no prior appreciable harm" due to Merrimack Station's thermal discharge during this four-decade period (Figure 3.8). The time series of annual total electrofishing CPUE from Hooksett Pool exhibited a Kendall's Tau b of -0.195 with a probability level of $p=0.543$. The electrofishing time series from Ambient Hooksett Pool exhibited a Kendall's Tau b of -0.195 with a probability level of p=0.543 and from the Thermally-influenced zone of Hooksett Pool a Kendall's Tau b of -0.309 with a probability level of p=0.347.

The UILT representing the maximum temperature permissible for summer survival of white sucker is reported to be 88°F, and the thermal avoidance temperature 86°F (Appendix C). This 86 °F temperature is the reported value at the mid-point of the range of available avoidance temperatures for this species. The relationship between the habitat volume potentially influenced by Merrimack Station's thermal discharge in Hooksett Pool and upper Amoskeag Pool, the two limiting or exclusionary thermal effects parameters (UILT and avoidance temperature), and three indicator thermal effects parameters (optimum growth, spawning and early life history temperatures) for white sucker are summarized in Table 5-19. The seasonal exposure, and time period examined in this report, for each of the six thermal effect parameters for white sucker in Hooksett Pool is summarized in Table 4-1. As a resident species, white sucker will utilize habitat within Hooksett Pool throughout the year and as a result, thermal exceedances of UILT, avoidance, optimum growth and preferred temperature limits should be examined for that entire time period. Spawning and life history thermal requirements need only be examined during late-April to early-May when white sucker in NH are known to be actively spawning (Scarola 1987). Visual inspection of the thermal plume data from the 1995 and 1978 Thermal Studies revealed that the UILT for white sucker was not exceeded anywhere within upper or lower Hooksett Pool or in upper Amoskeag Pool during the 1 April to 1 November period (Table 5-20). Examination of the frequency of occurrence of water temperatures data revealed that the UILT temperature for white sucker would only be exceeded under rare or extreme conditions of low river flow and high ambient water temperatures (with a probability of occurrence of one year out of every 100 years; Table 5-3). In the artificial habitat found within the man-made structure of Merrimack Station's cooling canal under summer conditions of low flow and warm ambient conditions, water temperatures are predicted to exceed the UILT temperature for white sucker (121 days for the extreme case and 95 days for the median case; Table 5-3). In lower Hooksett Pool, under summer conditions of low flow and warm ambient conditions, water temperatures are predicted to exceed the UILT temperature for white sucker during the extreme case (with a probability of occurrence of one year out of every 100 years) on 16 days (Table 5-3).

The upper mid-range avoidance temperature of 86°F for white sucker was not exceeded within upper Hooksett Pool or upper Amoskeag Pool during any of the nine thermal surveys. Within lower Hooksett Pool, the avoidance temperature was exceeded only on 21 June 1995 at the end of the cooling canal (S0). The observed river water temperature exceedences at Monitoring Station S0 during the 21 June 1995 survey occurred within the upper foot of the water column and represented 0.2% of the available habitat in lower Hooksett Pool (comprising 0.1% of the total Hooksett Pool habitat).

With respect to the indicator thermal effects parameters for white sucker springtime activities, the approximate mid-range of the reported spawning temperatures is 60°F, and the mid-range incubation temperature for early life history is 65°F (Appendix C). Through visual inspection of the cross-sectional contours of the thermal plume, it was determined that during the spring season within upper Hooksett Pool, ambient river water temperatures exceeded 60°F during the survey date of 24 May 1995. These observations are consistent with the reported spawning period for white sucker in New Hampshire waters of late April and May (Scarola 1987). The warm ambient conditions were also reflected in lower Hooksett Pool and in upper Amoskeag Pool, which exhibited water temperatures above 60°F on the above date. River water temperatures did not exceed the preferred spawning temperature anywhere in upper Hooksett pool or in upper Amoskeag Pool during the 11 May 1995 survey. River water temperatures exceeded the preferred spawning temperature for white sucker within the upper foot of the water column at Monitoring Station S-0, comprising 1.3% of the available habitat in lower Hooksett Pool (also comprising 0.7% of the total Hooksett Pool habitat) during the first spring survey on 11 May 1995.

The mid to upper incubation temperature for favorable hatching of white sucker eggs is 65°F (Appendix C) and was not exceeded within upper Hooksett Pool or upper Amoskeag Pool during the 11 May or 24 May sampling events. Within lower Hooksett Pool, the favorable hatching temperature for white sucker eggs was exceeded during the 24 May 1995 event at the end of the cooling canal (S0). This exceedence represented 1.2% of the available habitat in lower Hooksett Pool (also comprising 0.7% of the total Hooksett Pool habitat) and was limited to the upper two feet of the water column along the western bank. White sucker eggs will hatch in one to three weeks depending on water temperature (Scarola 1987). Eggs laid during the reported spawning period for white sucker in New Hampshire waters would have already hatched prior to Hooksett Pool water temperatures exceeding the ideal incubation temperature of 65°F later in June.

Reported year-round indicator thermal effect parameters for white sucker are an optimum temperature for growth and a preferred temperature of 81°F. Within upper Hooksett Pool and upper Amoskeag Pool, the optimum growth temperature and preferred temperature for white sucker were not exceeded during any of the nine sampling events. Within lower Hooksett Pool, the optimum growth and preferred temperature for white sucker was exceeded on 21 June 1995 at Monitoring Stations S0, S4, S8, S12 and S16, and on 14 September 1995 at Monitoring Stations S0, S4 and S8. The 21 June 1995 exceedences represented 13.6% of the available habitat in lower Hooksett Pool (also comprising 7.6% of the total Hooksett Pool habitat). At Monitoring Station S0, temperatures greater than 81°F ranged from the upper foot of the water column along the western bank to the upper four feet of the water column on the east bank (total depth along the east bank transect on 21 June 1995 was 12 feet). Exceedences at Monitoring Stations S8, S12 and S16 occurred only within the upper foot of the water column. On 14 September 1995, optimum growth and preference temperatures for white sucker were exceeded across 12.4% of the available habitat in lower Hooksett Pool (also comprising 6.9% of the total Hooksett Pool habitat). These exceedences were limited to the upper three feet of the water column at Monitoring Stations S0 and S4, and to the upper two feet of the mid-east channel at Monitoring Station S8.

Table 5-1. Alewife Percent Exceedances for Exclusionary Thermal Effects Parameters and Indicator Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
UILT (90°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Avoidance (84°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	2.106	2.7	1.5	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	356	0.5	0.3	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Optimum Growth (80°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	17.904	22.6	12.6	0	0.0
	11-Jul-78	287	0.4	0.2	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	17.280	21.8	12.2	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0

(continued)

Table 5-1. (Continued)

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Preferred (84°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	2.106	2.7	1.5	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	356	0.5	0.3	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Spawning (60°F)	11-May-95	995	1.3	0.7	0	0.0
	24-May-95	79.131	100.0	100.0	192.976	100.0
	9-Jun-95	79.131	100.0	100.0	192.976	100.0
	21-Jun-95	79.131	100.0	100.0	192.976	100.0
Life History (60°F)	11-May-95	995	1.3	0.7	0	0.0
	24-May-95	79.131	100.0	100.0	192.976	100.0
	9-Jun-95	79.131	100.0	100.0	192.976	100.0
	21-Jun-95	79.131	100.0	100.0	192.976	100.0

Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.

Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-2. **Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to Alewife of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.**

ALEWIFE								
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (90°F)	Avoidance 84°F)	Optimum Growth (80°F)	Preferred (84°F)	Spawning (60°F)	Early Life History (60°F)
Spring	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects	24 May 95 9 Jun 95 21 Jun 95	24 May 95 9 Jun 95 21 Jun 95
	Lower Hooksett Pool [a]		No effects	*2.7% (21 Jun 95)	22.6% (21 Jun 95)	*2.7% (21 Jun 95)	*1.3% (11 May 95) 100% (24 May 95) 100% (9 Jun 95) 100% (21 Jun 95)	*1.3% (11 May 95) 100% (24 May 95) 100% (9 Jun 95) 100% (21 Jun 95)
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects	100% (24 May 95) 100% (9 Jun 95) 100% (21 Jun 95)	100% (24 May 95) 100% (9 Jun 95) 100% (21 Jun 95)
Summer	Upper Hooksett Pool [b]		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool [b]		No effects	No effects	*0.4% (11 Jul 78)	No effects		
	Upper Amoskeag Pool							
	Mann-Kendall Analysis	Stable						
Fall	Upper Hooksett Pool [a]		No effects	No effects	14 Sep 95 (N5)	No effects		
	Lower Hooksett Pool[a]		No effects	*0.5% (14 Sep 95)	21.8% (14 Sep 95)	*0.5% (14 Sep 95)		
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects		
Winter	Upper Hooksett Pool		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool		No effects	No effects	No effects	No effects		

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b – As demonstrated by the 1978 Thermal Discharge Modeling

Table 5-3. Predicted Total Number of Days from 1 May through 31 October (214 total days) that Merrimack River Water Temperature in Hooksett Pool will be Exceeded for Each One-Degree Temperature Increment Based on a 1% or 25% Joint Probability of Occurrence of River Flow and Water Temperature at the Upstream Ambient Monitoring Station (N-10) and at Three Downstream Monitoring Stations (S-0, S-4, or A-0).

	1% Joint Probability (occurs one year out of every 100 years)				25% Joint Probability (occurs one year out of every four years)			
Temperature (°F)	N-10-10	S-0-10	S-4-10	A-0-10	N-10-50	S-0-50	S-4-50	A-0-50
38	214	214	214	214	213	214	214	214
39	214	214	214	214	212	214	214	214
40	214	214	214	214	210	214	214	212
41	214	214	214	214	206	214	214	208
42	211	214	214	214	204	214	214	205
43	207	214	214	214	202	214	214	204
44	207	214	214	214	198	214	214	198
45	205	214	214	214	195	214	213	195
46	202	214	214	214	194	214	210	192
47	199	214	214	214	189	214	208	189
48	199	214	214	211	186	214	205	187
49	197	214	214	207	180	214	203	185
50	196	214	208	204	177	214	200	185
51	191	214	207	202	171	214	197	183
52	186	214	207	199	166	214	194	181
53	184	214	203	198	162	214	192	178
54	182	214	202	196	159	214	188	177
55	176	214	199	193	156	214	185	176
56	172	214	198	189	147	214	184	171
57	168	214	196	188	145	214	178	167
58	160	214	193	187	139	214	174	162
59	156	214	188	183	136	214	167	158
60	149	214	185	180	134	214	164	155
61	148	214	183	177	131	214	160	151
62	145	214	181	174	124	214	158	147
63	140	214	175	167	117	214	152	141
64	138	214	172	163	109	214	147	138
65	134	214	164	159	105	212	141	133
66	128	214	160	157	101	209	137	128
67	122	212	156	154	97	206	135	125
68	119	207	151	147	93	203	133	120
69	116	207	147	145	88	200	128	111
70	102	203	146	141	80	197	121	107
71	95	202	140	132	71	194	113	104

(continued)

Table 5-3. (Continued)

Temperature (°F)	1% Joint Probability (occurs one year out of every 100 years)				25% Joint Probability (occurs one year out of every four years)			
	N-10-10	S-0-10	S-4-10	A-0-10	N-10-50	S-0-50	S-4-50	A-0-50
72	92	199	137	126	67	187	107	101
73	90	197	133	123	57	180	104	96
74	84	193	127	120	42	175	99	94
75	70	188	122	118	30	170	96	88
76	67	184	118	108	14	162	93	78
77	62	180	112	99	2	159	87	70
78	54	175	102	93	0	154	80	66
79	38	168	95	91	0	146	70	54
80	17	161	92	89	0	143	67	39
81	3	156	90	76	0	137	54	25
82	0	149	84	68	0	134	40	9
83	0	148	69	66	0	130	25	1
84	0	141	67	58	0	118	12	0
85	0	138	62	42	0	111	1	0
86	0	134	53	20	0	105	0	0
87	0	126	38	4	0	99	0	0
88	0	121	16	0	0	95	0	0
89	0	116	3	0	0	90	0	0
90	0	102	0	0	0	81	0	0
91	0	95	0	0	0	71	0	0
92	0	92	0	0	0	66	0	0
93	0	88	0	0	0	50	0	0
94	0	72	0	0	0	35	0	0
95	0	67	0	0	0	14	0	0
96	0	61	0	0	0	2	0	0
97	0	46	0	0	0	0	0	0
98	0	29	0	0	0	0	0	0
99	0	4	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0

Table 5-4. American Shad Percent Exceedances for Exclusionary Thermal Effects Parameters and Indicator Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
UILT (90°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Avoidance (86°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	175	0.2	0.1	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Optimum Growth (70°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	39.203	49.5	27.6	192.976	100.0
	21-Jun-95	79.131	100.0	100.0	192.976	100.0
	11-Jul-78	79.131	100.0	100.0	n/a	n/a
	8-Aug-78	79.131	100.0	100.0	n/a	n/a
	14-Sep-95	52.429	66.3	37.0	101.341	52.5
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	1.369	1.7	1.0	0	0.0

(continued)

Table 5-4. (Continued)

Parameter	Sample Date	Volume ($ft^3 * 10^3$) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume ($ft^3 * 10^3$) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Preferred (65°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	983	1.2	0.7	0	0.0
	9-Jun-95	79.131	100.0	100.0	192.976	100.0
	21-Jun-95	79.131	100.0	100.0	192.976	100.0
	11-Jul-78	79.131	100.0	100.0	n/a	n/a
	8-Aug-78	79.131	100.0	100.0	n/a	n/a
	14-Sep-95	79.131	100.0	100.0	192.976	100.0
	27-Sep-95	28.075	36.3	20.2	0	0.0
	11-Oct-95	15.454	19.5	10.9	0	0.0
Spawning (65°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	983	1.2	0.7	0	0.0
	9-Jun-95	79.131	100.0	100.0	192.976	100.0
	21-Jun-95	79.131	100.0	100.0	192.976	100.0
Life History (70°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	39.203	49.5	27.6	192.976	100.0
	21-Jun-95	79.131	100.0	100.0	192.976	100.0

Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.

Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-5. Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to American Shad of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.

AMERICAN SHAD								
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (90°F)	Avoidance (86°F)	Optimum Growth (70°F)	Preferred (65°F)	Spawning (65°F)	Early Life History (70°F)
Spring	Upper Hooksett Pool [a]		No effects	No effects	21 Jun 95	9 Jun 95 21 Jun 95	9 Jun 95 21 Jun 95	21 Jun 95
	Lower Hooksett Pool [a]		No effects	*0.2% (21 Jun 95)	49.5% (9 Jun 95) 100% (21 Jun 95)	*1.2% (24 May 95) 100% (9 Jun 95) 100% (21 Jun 95)	*1.2% (24 May 95) 100% (9 Jun 95) 100% (21 Jun 95)	49.5% (9 Jun 95) 100% (21 Jun 95)
	Upper Amoskeag Pool[a]		No effects	No effects	100% (9 Jun 95) 100% (21 Jun 95)	100% (9 Jun 95) 100% (21 Jun 95)	100% (9 Jun 95) 100% (21 Jun 95)	100% (9 Jun 95) 100% (21 Jun 95)
Summer	Upper Hooksett Pool [b]		No effects	No effects	11 Jul 78 8 Aug 78	11 Jul 78 8 Aug 78		
	Lower Hooksett Pool [b]		No effects	No effects	100% (11 Jul 78) 100% (8 Aug 78)	100% (11 Jul 78) 100% (8 Aug 78)		
	Upper Amoskeag Pool							
	Mann-Kendall Analysis							
Fall	Upper Hooksett Pool [a]		No effects	No effects	14 Sep 95	14 Sep 95		
	Lower Hooksett Pool[a]		No effects	No effects	66.3% (14 Sep 95) *1.7% (11 Oct 95)	100% (14 Sep 95) 36.3% (27 Sep 95) 19.5% (11 Oct 95)		
	Upper Amoskeag Pool[a]		No effects	No effects	52.5% (14 Sep 95)	100% (14 Sep 95)		
Winter	Upper Hooksett Pool		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool		No effects	No effects	No effects	No effects		

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b – As demonstrated by the 1978 Thermal Discharge Modeling

Table 5-6. Atlantic Salmon Percent Exceedances for Exclusionary Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
UILT (82°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
Avoidance (78°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0

* Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.

Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-7. Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to Atlantic Salmon of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.

			ATLANTIC SALMON					
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (82°F)	Avoidance (78°F)	Optimum Growth	Preferred	Spawning	Early Life History
Spring	Upper Hooksett Pool [a]		No effects	No effects	N/A	N/A	N/A	N/A
	Lower Hooksett Pool [a]		No effects	No effects	N/A	N/A	N/A	N/A
	Upper Amoskeag Pool[a]		No effects	No effects	N/A	N/A	N/A	N/A
Summer	Upper Hooksett Pool [b]		N/A	N/A	N/A	N/A	N/A	N/A
	Lower Hooksett Pool [b]		N/A	N/A	N/A	N/A	N/A	N/A
	Upper Amoskeag Pool				N/A	N/A	N/A	N/A
	Mann-Kendall Analysis							
Fall	Upper Hooksett Pool [a]		N/A	N/A	N/A	N/A	N/A	N/A
	Lower Hooksett Pool[a]		N/A	N/A	N/A	N/A	N/A	N/A
	Upper Amoskeag Pool[a]		N/A	N/A	N/A	N/A	N/A	N/A
Winter	Upper Hooksett Pool		N/A	N/A	N/A	N/A	N/A	N/A
	Lower Hooksett Pool		N/A	N/A	N/A	N/A	N/A	N/A
	Upper Amoskeag Pool		N/A	N/A	N/A	N/A	N/A	N/A

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b – As demonstrated by the 1978 Thermal Discharge Modeling
Note: N/A indicates that lifestage does not occur in Hooksett Pool

Table 5-8. Smallmouth Bass Percent Exceedances for Exclusionary Thermal Effects Parameters and Indicator Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume ($ft^3 * 10^3$) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume ($ft^3 * 10^3$) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Literature Reported UILT (98°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Observed UILT (100°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Avoidance (95°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0

(continued)

Table 5-8. (Continued)

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Optimum Growth (90°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Preferred (81°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	10.728	13.6	7.6	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	9.821	12.4	6.9	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Spawning (63°F)	11-May-95	163	0.2	0.1	0	0.0
	24-May-95	3.552	4.5	2.5	0	0.0
	9-Jun-95	79.131	100.0	100.0	192.976	100.0
Life History (70°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	39.203	49.5	27.6	192.976	100.0

* Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.

Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-9. Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to Smallmouth Bass of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.

SMALLMOUTH BASS								
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (98°F)	Avoidance (95°F)	Optimum Growth (90°F)	Preferred (81°F)	Spawning (63°F)	Early Life History (70°F)
Spring	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects	9 Jun 95	
	Lower Hooksett Pool [a]		No effects	No effects	No effects	13.6% (21 Jun 95)	4.5% (24 May 95) 100% (9 Jun 95)	49.5% (9 Jun 95)
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects	100% (9 Jun 95)	100% (9 Jun 95)
Summer	Upper Hooksett Pool [b]		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool [b]		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool							
	Mann-Kendall Analysis	Stable						
Fall	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool[a]		No effects	No effects	No effects	12.4% (14 Sep 95)		
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects		
Winter	Upper Hooksett Pool		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool		No effects	No effects	No effects	No effects		

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b – As demonstrated by the 1978 Thermal Discharge Modeling

Table 5-10. Comparison of Literature Based UILT and Avoidance Temperatures Versus those Observed During Electrofish and Trapnet Sampling in the Cooling Canal of Merrimack Station.

Gear	RIS	Canal Station	Temperature as Measured in Canal (°C)																											
			13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Electrofish	Largemouth bass	Upstream				4	12.1	8						3	0						1			1.3			0	0		
Electrofish	Largemouth bass	Downstream		8		2	0				1		2	2				2				0	3.4	0						
																							Reported UILT (35°C)							
																							Reported Avoidance (32.2°C)							
Electrofish	Pumpkinseed	Upstream				0	14	0						0	1.3						0			0			0	0		
	Pumpkinseed	Upstream					3.4																							
Electrofish	Pumpkinseed	Downstream				0	2				1		0	1.3				0				1.3	0	0						
	Pumpkinseed	Downstream					3.4																							
Trapnet (2")	Pumpkinseed	Upstream			0	1	1						0									5	34						0	
Trapnet (2")	Pumpkinseed	Downstream			4		21					3					1			35				5.5						
	Pumpkinseed	Downstream			3.5																			1.5						
																						Reported UILT (34.4°C)								
																						Reported Avoidance (31.1°C)								
Electrofish	Smallmouth bass	Upstream				2	10.7	2						8	8						0			0.7			0	0		
Electrofish	Smallmouth bass	Downstream																												
Trapnet (3/4")	Smallmouth bass	Upstream		0.3						0					0.8								3.5		0	0.3		0.3		

(continued)

Table 5-10. (Continued)

Gear	RIS	Canal Station	Temperature as Measured in Canal (°C)																											
			13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Trapnet (3/4")	Smallmouth bass	Downstream	1.5						1.1						2					6.8	2.5	7.3			3.5					
Trapnet (2")	Smallmouth bass	Upstream			0	0	0.5						0									1.5	25						0	
Trapnet (2")	Smallmouth bass	Downstream			1		4.5					4					0			32				5						
	Smallmouth bass	Downstream			4																			1.5						
																									Reported UILT (36.7°C) Reported Avoidance (35.0°C)					

Table 5-11. Largemouth Bass Percent Exceedances for Exclusionary Thermal Effects Parameters and Indicator Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
UILT (95°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Literature Reported Avoidance (90°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Observed Avoidance (93°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0

(continued)

Table 5-11. (Continued)

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Optimum Growth (83°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	3.726	4.7	2.6	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	1.453	1.8	1.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Preferred (86°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	174	0.2	0.1	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Spawning (70°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	39.203	49.5	27.6	192.976	100.0
Life History (75°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	1.100	1.4	0.8	0	0.0

* Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.

Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-12. Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to Largemouth Bass of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.

LARGEMOUTH BASS								
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (95°F)	Avoidance (90°F)	Optimum Growth (83°F)	Preferred (86°F)	Spawning (70°F)	Early Life History (75°F)
Spring	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects	No effects	No effects
	Lower Hooksett Pool [a]		No effects	No effects	4.7% (21 Jun 95)	*0.2% (21 Jun 95)	49.5% (9 Jun 95)	*1.4% (9 Jun 95)
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects	100% (9 Jun 95)	No effects
Summer	Upper Hooksett Pool [b]		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool [b]		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool							
	Mann-Kendall Analysis	Stable						
Fall	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool[a]		No effects	No effects	* 1.8% (14 Sep 95)	No effects		
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects		
Winter	Upper Hooksett Pool		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool		No effects	No effects	No effects	No effects		

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b – As demonstrated by the 1978 Thermal Discharge Modeling

Table 5-13. Pumpkinseed Percent Exceedances for Exclusionary Thermal Effects Parameters and Indicator Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Literature Reported	11-May-95	0	0.0	0.0	0	0.0
UILT (94°F)	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Observed	11-May-95	0	0.0	0.0	0	0.0
UILT (94°F)	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Literature Reported	11-May-95	0	0.0	0.0	0	0.0
Avoidance (88°F)	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Observed	11-May-95	0	0.0	0.0	0	0.0
Avoidance (93°F)	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0

(continued)

Table 5-13 (Continued)

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Optimum	11-May-95	0	0.0	0.0	0	0.0
Growth (86°F)	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	174	0.2	0.1	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Preferred (86°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	174	0.2	0.1	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Spawning (67°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	169	0.2	0.1	0	0.0
	9-Jun-95	76.316	96.4	53.8	192.976	100.0
	21-Jun-95	79.131	100.0	100.0	192.976	100.0
	11-Jul-78	79.131	100.0	100.0	192.976	100.0
	8-Aug-78	79.131	100.0	100.0	192.976	100.0
Life History (71°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	15.865	20.0	11.2	65.137	33.8
	21-Jun-95	79.131	100.0	100.0	192.976	100.0
	11-Jul-78	79.131	100.0	100.0	192.976	100.0
	8-Aug-78	79.131	100.0	100.0	192.976	100.0

* Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.
Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-14. Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to Pumpkinseed of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.

PUMPKINSEED								
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (94°F)	Avoidance (88°F)	Optimum Growth (86°F)	Preferred (86°F)	Spawning (67°F)	Early Life History (71°F)
Spring	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects	9 Jun 95 21 Jun 95	21 Jun 95
	Lower Hooksett Pool [a]		No effects	No effects	*0.2% (21 Jun 95)	*0.2% (21 Jun 95)	*0.2 (24 May 95) 96.4% (9 Jun 95) 100% (21 Jun 95)	20.0% (9 Jun 95) 100% (21Jun 95)
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects	100% (9 Jun 95) 100% (21Jun 95)	33.8% (9 Jun 95) 100% (21 Jun 95)
Summer	Upper Hooksett Pool [b]		No effects	No effects	No effects	No effects	11 Jul 78 8 Aug 78	11 Jul 78 8 Aug 78
	Lower Hooksett Pool [b]		No effects	No effects*	No effects	No effects	100% 11 Jul 78 100% 8 Aug 78	100% 11 Jul 78 100% 8 Aug 78
	Upper Amoskeag Pool						100% 11 Jul 78 100% 8 Aug 78	100% 11 Jul 78 100% 8 Aug 78
	Mann-Kendall Analysis	Decreasing						
Fall	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool[a]		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects		
Winter	Upper Hooksett Pool		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool		No effects	No effects	No effects	No effects		

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b – As demonstrated by the 1978 Thermal Discharge Modeling

Table 5-15. Yellow Perch Percent Exceedances for Exclusionary Thermal Effects Parameters and Indicator Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume ($ft^3 * 10^3$) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume ($ft^3 * 10^3$) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
UILT (90°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Avoidance (83°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	3.726	4.7	2.6	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	1.453	1.8	1.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Optimum Growth (74°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	4.692	5.9	3.3	0	0.0
	21-Jun-95	74.804	94.5	52.8[a]	192.976	100.0
	11-Jul-78	79.131	100.0	100.0	n/a	n/a
	8-Aug-78	77.205	97.6	54.5	n/a	n/a
	14-Sep-95	36.916	46.7	26.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0

(continued)

Table 5-15. (Continued)

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Preferred (77°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	132	0.2	0.1	0	0.0
	21-Jun-95	40.301	50.9	28.4	187.781	97.3
	11-Jul-78	56.415	71.3	39.8	n/a	n/a
	8-Aug-78	16.568	20.9	11.7	n/a	n/a
	14-Sep-95	24.630	31.1	17.4	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Spawning (50°F)	11-May-95	79.131	100.0	100.0	192.976	100.0
Life History (65°F)	11-May-95	0	0.0	0.0	0	0.0

* Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.

Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-16. **Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to Yellow Perch of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.**

YELLOW PERCH								
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (90°F)	Avoidance (83°F)	Optimum Growth (74°F)	Preferred (77°F)	Spawning (50°F)	Early Life History (65°F)
Spring	Upper Hooksett Pool [a]		No effects	No effects	21 Jun 95	No effects	11 May 95	No effects
	Lower Hooksett Pool [a]		No effects	4.7% (21 Jun 95)	5.9% (9 Jun 95) 94.5% (21 Jun 95)	*0.2% (9 Jun 95) 50.9% (21 Jun 95)	100% (11 May 95)	No effects
	Upper Amoskeag Pool[a]		No effects	No effects	100% (21 Jun 95)	97.3% (21 Jun 95)	100% (11 May 95)	No effects
Summer	Upper Hooksett Pool [b]		No effects	No effects	11 Jul 78 8 Aug 78	No effects		
	Lower Hooksett Pool [b]		No effects	No effects	100% (11 Jul 78) 97.6% (8 Aug 78)	71.3% (11 Jul 78) 20.9% (8 Aug 78)		
	Upper Amoskeag Pool							
	Mann-Kendall Analysis	Stable						
Fall	Upper Hooksett Pool [a]		No effects	No effects	14 Sep 95	14 Sep 95		
	Lower Hooksett Pool[a]		No effects	*1.8% (14 Sep 95)	46.7% (14 Sep 95)	31.1% (14 Sep 95)		
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects		
Winter	Upper Hooksett Pool		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool		No effects	No effects	No effects	No effects		

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b – As demonstrated by the 1978 Thermal Discharge Modeling

Table 5-17. Fallfish Percent Exceedances for Exclusionary Thermal Effects Parameters and Indicator Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
UILT (90°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Avoidance (82°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	5.566	7.0	3.9	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	3.581	4.5	2.5	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Optimum Growth (68°F)	11-May-95	0				
	24-May-95	11	0.01	0.008	0	0.0
	9-Jun-95	63,891	80.7	45.1	192.976	100.0
	21-Jun-95	79.131	100.0	100.0	192.976	100.0
	11-Jul-78	79.131	100.0	100.0	n/a	n/a
	8-Aug-78	79.131	100.0	100.0	n/a	n/a
	14-Sep-95	64.908	82.0	45.8	192.976	100.0
	27-Sep-95	603	0.8	0.4	0	0.0
	11-Oct-95	5.280	6.7	3.7	0	0.0
Spawning (60°F)	11-May-95	995	1.3	0.7	0	0.0
	24-May-95	79.131	100.0	100.0	192.976	100.0
Life History (65°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	983	1.2	0.7	0	0.0

* Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.

Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-18. Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to Fallfish of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.

FALLFISH								
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (90°F)	Avoidance (82°F)	Optimum Growth (68°F)	Preferred (n/a)	Spawning (60°F)	Early Life History (65°F)
Spring	Upper Hooksett Pool [a]		No effects	No effects	21 Jun 95		24 May 95	No effects
	Lower Hooksett Pool [a]		No effects	7.0% (21 Jun 95)	*0.01% (24 May 95) 80.7% (9 Jun 95) 100% (21 Jun 95)		*1.3% (11 May 95) 100% (24 May 95)	*1.2% (24 May 95)
	Upper Amoskeag Pool[a]		No effects	No effects	100% (9 Jun 95) 100% (21 Jun 95)		100% (24 May 95)	No effects
Summer	Upper Hooksett Pool [b]		No effects	No effects	11 Jul 78 8 Aug 78			
	Lower Hooksett Pool [b]		No effects	No effects	100% (11 Jul 78) 100% (8 Aug 78)			
	Upper Amoskeag Pool							
	Mann-Kendall Analysis	Stable	.					
Fall	Upper Hooksett Pool [a]		No effects	14 Sep 95 (N5)	No effects			
	Lower Hooksett Pool[a]		No effects	4.5% (14 Sep 95)	82.0% (14 Sep 95) *0.8% (27 Sep 95) 6.7% (11 Oct 95)			
	Upper Amoskeag Pool[a]		No effects	No effects	100% (14 Sep 95)			
Winter	Upper Hooksett Pool		No effects	No effects	No effects			
	Lower Hooksett Pool		No effects	No effects	No effects			
	Upper Amoskeag Pool		No effects	No effects	No effects			

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b – As demonstrated by the 1978 Thermal Discharge Modeling

Table 5-19. White Sucker Percent Exceedances for Exclusionary Thermal Effects Parameters and Indicator Thermal Effects Parameters for Lower Hooksett Pool and Total Hooksett and Amoskeag Pool Volumes during the Spring, Summer and Fall Time Periods.

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
UILT (88°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	0	0.0	0.0	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Avoidance (86°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	175	0.2	0.1	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	0	0.0	0.0	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Optimum Growth (81°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	10.728	13.6	7.6	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	9.821	12.4	6.9	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0

(continued)

Table 5-19. (Continued)

Parameter	Sample Date	Volume (ft^3*10^3) of Temperature Exceedance in Hooksett Pool	% Exceedance S0-Hooksett Dam	% Exceedance Hooksett Pool	Volume (ft^3*10^3) of Temperature Exceedance in Amoskeag Pool	% Exceedance Amoskeag Pool
Preferred (81°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	0	0.0	0.0	0	0.0
	9-Jun-95	0	0.0	0.0	0	0.0
	21-Jun-95	10.728	13.6	7.6	0	0.0
	11-Jul-78	0	0.0	0.0	n/a	n/a
	8-Aug-78	0	0.0	0.0	n/a	n/a
	14-Sep-95	9.821	12.4	6.9	0	0.0
	27-Sep-95	0	0.0	0.0	0	0.0
	11-Oct-95	0	0.0	0.0	0	0.0
Spawning (60°F)	11-May-95	995	1.3	0.7	0	0.0
	24-May-95	79.131	100.0	100.0	192.976	100.0
Life History (65°F)	11-May-95	0	0.0	0.0	0	0.0
	24-May-95	983	1.2	0.7	0	0.0

* Based on Thermally-influenced lower Hooksett Pool volume of 79.130.625 ft^3. a Total volume of 141.788.385.9 ft^3. and an Amoskeag volume of 192.976.312 ft^3.

Note: Volumetric data in the above table is measurable to the nearest 100.000 cubic feet representing 0.12% of the total Hooksett Pool volume and 0.05% of Amoskeag Pool Volume.

Table 5-20. Summary of Potential Impacts (Percentage of available habitat in excess of Indicator Temperature and date of Exceedance) to White Sucker of Merrimack Station's Existing Thermal Discharge in the Upper and Lower Portions of Hooksett Pool and Upper Amoskeag Pool.

WHITE SUCKER								
			Exclusionary Temperatures		Thermal Indicator Temperatures			
Season	Zone	Mann-Kendall Analysis	UILT (88°F)	Avoidance (86°F)	Optimum Growth (81°F)	Preferred (81°F)	Spawning (60°F)	Early Life History (65°F)
Spring	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects	24 May 95	No effects
	Lower Hooksett Pool [a]		No effects	*0.2 (21 Jun 95)	13.6% (21 Jun 95)	13.6% (21 Jun 95)	*1.3% (11 May 95) 100% (24 May 95)	*1.2% (24 May 95)
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects	100% (24 May 95)	No effects
Summer	Upper Hooksett Pool [b]		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool [b]		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool							
	Mann-Kendall Analysis	Stable						
Fall	Upper Hooksett Pool [a]		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool[a]		No effects	No effects	12.4% (14 Sep 95)	12.4% (14 Sep 95)		
	Upper Amoskeag Pool[a]		No effects	No effects	No effects	No effects		
Winter	Upper Hooksett Pool		No effects	No effects	No effects	No effects		
	Lower Hooksett Pool		No effects	No effects	No effects	No effects		
	Upper Amoskeag Pool		No effects	No effects	No effects	No effects		

* Denotes exceedance occurred at S0 only.
a – As demonstrated by the 1995 Thermal Discharge Modeling Study
b - As demonstrated by the 1978 Thermal Discharge Modeling

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APPENDIX A

2004 and 2005 Trapnet and Electrofishing Catch

Appendix Table A-1. Total 2004 catch for 3/4-inch mesh trapnets sorted by month, Monitoring Station, site and date.

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
April	1	W	04/19/04	American Eel	1	46.87	1.02
April	1	W	04/19/04	Fallfish	2	46.87	2.05
April	1	W	04/19/04	Rock Bass	1	46.87	1.02
April	1	W	04/19/04	Spottail Shiner	5	46.87	5.12
April	1	W	04/19/04	White Sucker	14	46.87	14.34
April	1	W	04/19/04	Yellow Perch	1	46.87	1.02
April	1	W	04/21/04	Bluegill	1	46.95	1.02
April	1	W	04/21/04	Golden Shiner	2	46.95	2.04
April	1	W	04/21/04	Rock Bass	1	46.95	1.02
April	1	W	04/21/04	White Sucker	7	46.95	7.16
April	1	W	04/21/04	Yellow Perch	1	46.95	1.02
April	1	E	04/19/04	Pumpkinseed	1	46.28	1.04
April	1	E	04/19/04	Spottail Shiner	1	46.28	1.04
April	1	E	04/21/04	Spottail Shiner	1	46.57	1.03
April	2	W	04/19/04	Yellow Perch	1	45.17	1.06
April	2	W	04/21/04	Bluegill	1	47.05	1.02
April	2	W	04/21/04	Rock Bass	2	47.05	2.04
April	3	E	04/19/04	Rock Bass	1	45.15	1.06
April	3	E	04/21/04	Rock Bass	1	46.52	1.03
April	4		04/19/04	Bluegill	1	48.32	0.99
April	4		04/19/04	Redbreast Sunfish	1	48.32	0.99
April	4		04/21/04	No Fish Caught	0	46.90	0.00
April	5		04/19/04	Bluegill	1	48.12	1.00
April	5		04/19/04	Rock Bass	2	48.12	2.00
April	5		04/19/04	Smallmouth Bass	4	48.12	3.99
April	5		04/21/04	Bluegill	4	46.98	4.09
April	5		04/21/04	Rock Bass	1	46.98	1.02
May	1	W	05/17/04	Rock Bass	2	46.62	2.06
May	1	W	05/17/04	White Sucker	1	46.62	1.03
May	1	W	05/17/04	Yellow Perch	2	46.62	2.06
May	1	W	05/19/04	American Eel	3	47.58	3.03
May	1	W	05/19/04	Redbreast Sunfish	2	47.58	2.02
May	1	W	05/19/04	Rock Bass	5	47.58	5.04
May	1	W	05/19/04	Smallmouth Bass	5	47.58	5.04
May	1	W	05/19/04	Yellow Bullhead	1	47.58	1.01
May	1	W	05/19/04	Yellow Perch	3	47.58	3.03
May	1	E	05/17/04	Brown Bullhead	1	46.60	1.03
May	1	E	05/17/04	Redbreast Sunfish	1	46.60	1.03
May	1	E	05/17/04	Rock Bass	6	46.60	6.18

(continued)

Appendix Table A-1. Continued)

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
May	1	E	05/17/04	Smallmouth Bass	4	46.60	4.12
May	1	E	05/17/04	Yellow Perch	2	46.60	2.06
May	1	E	05/19/04	American Eel	1	47.78	1.00
May	1	E	05/19/04	Redbreast Sunfish	1	47.78	1.00
May	1	E	05/19/04	Smallmouth Bass	1	47.78	1.00
May	2	W	05/17/04	American Eel	2	45.95	2.09
May	2	W	05/17/04	Black Crappie	2	45.95	2.09
May	2	W	05/17/04	Bluegill	2	45.95	2.09
May	2	W	05/17/04	Brown Bullhead	1	45.95	1.04
May	2	W	05/17/04	Rock Bass	3	45.95	3.13
May	2	W	05/17/04	Smallmouth Bass	4	45.95	4.18
May	2	W	05/17/04	White Sucker	3	45.95	3.13
May	2	W	05/17/04	Yellow Bullhead	1	45.95	1.04
May	2	W	05/19/04	Bluegill	1	48.32	0.99
May	2	W	05/19/04	Redbreast Sunfish	1	48.32	0.99
May	2	W	05/19/04	Rock Bass	3	48.32	2.98
May	2	W	05/19/04	Smallmouth Bass	1	48.32	0.99
May	3	E	05/17/04	Redbreast Sunfish	1	46.67	1.03
May	3	E	05/17/04	Rock Bass	2	46.67	2.06
May	3	E	05/17/04	Smallmouth Bass	3	46.67	3.09
May	3	E	05/19/04	Bluegill	1	47.65	1.01
May	3	E	05/19/04	Redbreast Sunfish	5	47.65	5.04
May	3	E	05/19/04	Smallmouth Bass	3	47.65	3.02
May	4		05/17/04	Bluegill	2	45.92	2.09
May	4		05/19/04	Black Crappie	2	48.13	1.99
May	4		05/19/04	Bluegill	1	48.13	1.00
May	4		05/19/04	Brown Bullhead	1	48.13	1.00
May	5		05/17/04	Redbreast Sunfish	1	46.42	1.03
May	5		05/19/04	Bluegill	3	47.97	3.00
May	5		05/19/04	Redbreast Sunfish	3	47.97	3.00
May	5		05/19/04	Smallmouth Bass	1	47.97	1.00
June	1	W	06/21/04	Rock Bass	3	46.92	3.07
June	1	W	06/21/04	Smallmouth Bass	3	46.92	3.07
June	1	W	06/23/04	Bluegill	1	49.65	0.97
June	1	W	06/23/04	Fallfish	1	49.65	0.97
June	1	W	06/23/04	Rock Bass	5	49.65	4.83
June	1	W	06/23/04	Smallmouth Bass	1	49.65	0.97
June	1	E	06/21/04	Rock Bass	1	46.90	1.02
June	1	E	06/21/04	Smallmouth Bass	3	46.90	3.07
June	1	E	06/23/04	Brown Bullhead	1	49.80	0.96

(continued)

Appendix Table A-1. Continued)

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
June	1	E	06/23/04	Redbreast Sunfish	1	49.80	0.96
June	1	E	06/23/04	Rock Bass	2	49.80	1.93
June	1	E	06/23/04	Smallmouth Bass	2	49.80	1.93
June	2	W	06/21/04	Black Crappie	3	46.78	3.08
June	2	W	06/21/04	Smallmouth Bass	3	46.78	3.08
June	2	W	06/23/04	Smallmouth Bass	23	50.25	21.97
June	2	W	06/23/04	White Sucker	1	50.25	0.96
June	3	E	06/21/04	Bluegill	5	46.55	5.16
June	3	E	06/21/04	Redbreast Sunfish	1	46.55	1.03
June	3	E	06/21/04	Rock Bass	3	46.55	3.09
June	3	E	06/21/04	Smallmouth Bass	5	46.55	5.16
June	3	E	06/21/04	Yellow Bullhead	1	46.55	1.03
June	3	E	06/23/04	Bluegill	4	50.33	3.81
June	3	E	06/23/04	Rock Bass	1	50.33	0.95
June	3	E	06/23/04	Smallmouth Bass	1	50.33	0.95
June	4		06/21/04	Bluegill	1	47.02	1.02
June	4		06/21/04	Smallmouth Bass	4	47.02	4.08
June	4		06/23/04	No Fish Caught	0	50.17	0.00
June	5		06/21/04	Black Crappie	1	47.05	1.02
June	5		06/21/04	Largemouth Bass	1	47.05	1.02
June	5		06/21/04	Smallmouth Bass	2	47.05	2.04
June	5		06/23/04	Smallmouth Bass	5	50.20	4.78
July	1	W	07/19/04	No Fish Caught	0	46.45	0.00
July	1	W	07/21/04	White Sucker	1	48.32	0.99
July	1	E	07/19/04	Redbreast Sunfish	1	46.38	1.03
July	1	E	07/19/04	Smallmouth Bass	1	46.38	1.03
July	1	E	07/19/04	Spottail Shiner	1	46.38	1.03
July	1	E	07/21/04	Bluegill	1	48.08	1.00
July	1	E	07/21/04	Margined Madtom	1	48.08	1.00
July	1	E	07/21/04	Redbreast Sunfish	1	48.08	1.00
July	1	E	07/21/04	Smallmouth Bass	5	48.08	4.99
July	2	W	07/19/04	Rock Bass	1	46.25	1.04
July	2	W	07/19/04	Smallmouth Bass	8	46.25	8.30
July	2	W	07/21/04	Bluegill	1	48.15	1.00
July	2	W	07/21/04	Smallmouth Bass	7	48.15	6.98
July	3	E	07/19/04	Bluegill	1	46.17	1.04
July	3	E	07/19/04	Smallmouth Bass	2	46.17	2.08
July	3	E	07/19/04	Yellow Perch	1	46.17	1.04
July	3	E	07/21/04	Black Crappie	1	48.10	1.00
July	3	E	07/21/04	Bluegill	1	48.10	1.00
July	3	E	07/21/04	Rock Bass	1	48.10	1.00

(continued)

Appendix Table A-1. Continued)

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
July	3	E	07/21/04	Smallmouth Bass	6	48.10	5.99
July	4		07/19/04	Largemouth Bass	3	46.35	3.11
July	4		07/19/04	Pumpkinseed	2	46.35	2.07
July	4		07/19/04	Smallmouth Bass	1	46.35	1.04
July	4		07/21/04	Bluegill	2	48.88	1.96
July	5		07/19/04	Redbreast Sunfish	2	46.22	2.08
July	5		07/19/04	Smallmouth Bass	2	46.22	2.08
July	5		07/21/04	Redbreast Sunfish	2	48.90	1.96
July	5		07/21/04	Smallmouth Bass	11	48.90	10.80
August	1	W	08/23/04	Black Crappie	3	46.40	3.10
August	1	W	08/23/04	Rock Bass	2	46.40	2.07
August	1	W	08/23/04	Smallmouth Bass	13	46.40	13.45
August	1	W	08/25/04	Bluegill	1	48.50	0.99
August	1	W	08/25/04	Rock Bass	2	48.50	1.98
August	1	W	08/25/04	Smallmouth Bass	6	48.50	5.94
August	1	E	08/23/04	Rock Bass	1	46.80	1.03
August	1	E	08/23/04	Smallmouth Bass	2	46.80	2.05
August	1	E	08/25/04	Smallmouth Bass	2	48.17	1.99
August	2	W	08/23/04	Smallmouth Bass	6	46.77	6.16
August	2	W	08/25/04	American Eel	1	50.47	0.95
August	2	W	08/25/04	Black Crappie	1	50.47	0.95
August	2	W	08/25/04	Bluegill	1	50.47	0.95
August	2	W	08/25/04	Brown Bullhead	1	50.47	0.95
August	2	W	08/25/04	Rock Bass	1	50.47	0.95
August	2	W	08/25/04	Smallmouth Bass	3	50.47	2.85
August	3	E	08/23/04	Rock Bass	2	46.82	2.05
August	3	E	08/23/04	Smallmouth Bass	3	46.82	3.08
August	3	E	08/25/04	Bluegill	2	50.33	1.91
August	3	E	08/25/04	Smallmouth Bass	3	50.33	2.86
August	4		08/23/04	No Fish Caught	0	46.58	0.00
August	4		08/25/04	Smallmouth Bass	1	48.22	1.00
August	5		08/23/04	Bluegill	2	46.45	2.07
August	5		08/23/04	Largemouth Bass	1	46.45	1.03
August	5		08/23/04	Rock Bass	1	46.45	1.03
August	5		08/23/04	Smallmouth Bass	6	46.45	6.20
August	5		08/25/04	Bluegill	1	48.18	1.00
August	5		08/25/04	Redbreast Sunfish	1	48.18	1.00
August	5		08/25/04	Smallmouth Bass	10	48.18	9.96
September	1	W	09/20/04	Eastern Silvery Minnow	3	47.88	3.01
September	1	W	09/20/04	Smallmouth Bass	3	47.88	3.01
September	1	W	09/20/04	Spottail Shiner	36	47.88	36.09

(continued)

Appendix Table A-1. Continued)

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
September	1	W	09/20/04	Yellow Bullhead	1	47.88	1.00
September	1	W	09/22/04	Fallfish	1	47.33	1.01
September	1	W	09/22/04	Smallmouth Bass	1	47.33	1.01
September	1	W	09/22/04	Spottail Shiner	3	47.33	3.04
September	1	W	09/22/04	White Sucker	1	47.33	1.01
September	1	E	09/20/04	Smallmouth Bass	2	48.28	1.99
September	1	E	09/22/04	Chain Pickerel	1	47.17	1.02
September	1	E	09/22/04	Eastern Silvery Minnow	1	47.17	1.02
September	1	E	09/22/04	Fallfish	2	47.17	2.04
September	1	E	09/22/04	Smallmouth Bass	6	47.17	6.11
September	1	E	09/22/04	Spottail Shiner	53	47.17	53.94
September	1	E	09/22/04	Yellow Perch	1	47.17	1.02
September	2	W	09/20/04	Bluegill	1	48.10	1.00
September	2	W	09/20/04	Pumpkinseed	1	48.10	1.00
September	2	W	09/22/04	Rock Bass	1	47.15	1.02
September	2	W	09/22/04	Smallmouth Bass	6	47.15	6.11
September	3	E	09/20/04	Bluegill	1	48.33	0.99
September	3	E	09/20/04	Redbreast Sunfish	1	48.33	0.99
September	3	E	09/22/04	Bluegill	1	47.07	1.02
September	3	E	09/22/04	Pumpkinseed	1	47.07	1.02
September	3	E	09/22/04	Redbreast Sunfish	2	47.07	2.04
September	3	E	09/22/04	Smallmouth Bass	2	47.07	2.04
September	5		09/20/04	Black Crappie	1	47.90	1.00
September	5		09/20/04	Redbreast Sunfish	1	47.90	1.00
September	5		09/20/04	Smallmouth Bass	4	47.90	4.01
September	5		09/22/04	Smallmouth Bass	2	47.45	2.02
October	1	W	10/11/04	No Fish Caught	0	47.08	0.00
October	1	W	10/13/04	No Fish Caught	0	48.53	0.00
October	1	E	10/11/04	Yellow Bullhead	1	48.08	1.00
October	1	E	10/13/04	Smallmouth Bass	1	48.38	0.99
October	2	W	10/11/04	Bluegill	8	48.00	8.00
October	2	W	10/11/04	Largemouth Bass	1	48.00	1.00
October	2	W	10/13/04	Bluegill	3	48.17	2.99
October	2	W	10/13/04	Largemouth Bass	1	48.17	1.00
October	2	W	10/13/04	Rock Bass	1	48.17	1.00
October	2	W	10/13/04	White Sucker	2	48.17	1.99
October	3	E	10/11/04	Redbreast Sunfish	1	48.00	1.00
October	3	E	10/11/04	Smallmouth Bass	4	48.00	4.00
October	3	E	10/13/04	Redbreast Sunfish	1	48.25	0.99
October	3	E	10/13/04	Smallmouth Bass	2	48.25	1.99
October	5		10/11/04	Smallmouth Bass	2	46.92	2.05

(continued)

Appendix Table A-1. Continued)

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
October	5		10/13/04	Rock Bass	1	48.75	0.98
October	5		10/13/04	Smallmouth Bass	6	48.75	5.91
December	1	W	12/06/04	Redbreast Sunfish	1	48.00	1.00
December	1	W	12/08/04	No Fish Caught	0	48.67	0.00
December	1	E	12/06/04	No Fish Caught	0	47.50	0.00
December	1	E	12/08/04	No Fish Caught	0	48.92	0.00
December	2	W	12/06/04	Spottail Shiner	2	46.83	2.05
December	2	W	12/08/04	Spottail Shiner	27	48.92	26.49
December	2	W	12/08/04	White Sucker	1	48.92	0.98
December	2	W	12/08/04	Yellow Perch	1	48.92	0.98
December	3	E	12/06/04	No Fish Caught	0	47.00	0.00
December	3	E	12/08/04	Pumpkinseed	1	48.83	0.98
December	3	E	12/08/04	Rock Bass	1	48.83	0.98
December	3	E	12/08/04	Spottail Shiner	3	48.83	2.95
December	4		12/06/04	Bluegill	1	47.42	1.01
December	4		12/06/04	Largemouth Bass	1	47.42	1.01
December	4		12/06/04	Redbreast Sunfish	1	47.42	1.01
December	4		12/06/04	Rock Bass	1	47.42	1.01
December	4		12/06/04	Smallmouth Bass	1	47.42	1.01
December	4		12/08/04	Black Crappie	1	48.50	0.99
December	4		12/08/04	Bluegill	9	48.50	8.91
December	4		12/08/04	Redbreast Sunfish	1	48.50	0.99
December	4		12/08/04	Rock Bass	1	48.50	0.99
December	5		12/06/04	Black Crappie	3	47.17	3.05
December	5		12/06/04	Bluegill	3	47.17	3.05
December	5		12/06/04	Rock Bass	9	47.17	9.16
December	5		12/06/04	Smallmouth Bass	5	47.17	5.09
December	5		12/08/04	Pumpkinseed	2	48.75	1.97
December	5		12/08/04	Redbreast Sunfish	1	48.75	0.98
December	5		12/08/04	Rock Bass	1	48.75	0.98
December	5		12/08/04	Smallmouth Bass	1	48.75	0.98

Appendix Table A-2. Total 2004 catch for electrofishing sorted by month, station, site and date.

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
April	11	W	04/30/04	Rock Bass	1	21.25	1000	1
April	11	W	04/30/04	Spottail Shiner	58	21.25	1000	58
April	11	W	04/30/04	White Sucker	7	21.25	1000	7
April	11	W	04/30/04	Yellow Perch	1	21.25	1000	1
April	11	E	04/30/04	Golden Shiner	4	21.22	1000	4
April	11	E	04/30/04	Smallmouth Bass	1	21.22	1000	1
April	11	E	04/30/04	Spottail Shiner	161	21.22	1000	161
April	11	E	04/30/04	Tessellated Darter	2	21.22	1000	2
April	11	E	04/30/04	White Sucker	1	21.22	1000	1
April	12	W	04/30/04	Spottail Shiner	1	16.03	1000	1
April	12	W	04/30/04	White Sucker	2	16.03	1000	2
April	12	E	04/30/04	Fallfish	1	17.78	1000	1
April	12	E	04/30/04	Spottail Shiner	2	17.78	1000	2
April	12	E	04/30/04	Tessellated Darter	1	17.78	1000	1
April	12	E	04/30/04	White Sucker	4	17.78	1000	4
April	12	E	04/30/04	Yellow Perch	2	17.78	1000	2
April	13	W	05/01/04	Bluegill	1	17.80	1000	1
April	13	W	05/01/04	Brown Bullhead	1	17.80	1000	1
April	13	W	05/01/04	Rock Bass	1	17.80	1000	1
April	13	W	05/01/04	Smallmouth Bass	1	17.80	1000	1
April	13	W	05/01/04	Spottail Shiner	2	17.80	1000	2
April	13	W	05/01/04	Tessellated Darter	1	17.80	1000	1
April	13	W	05/01/04	Yellow Perch	1	17.80	1000	1
April	13	E	05/01/04	Spottail Shiner	66	16.78	1000	66
April	14	W	05/01/04	Golden Shiner	12	14.77	1000	12
April	14	W	05/01/04	Redbreast Sunfish	1	14.77	1000	1
April	14	W	05/01/04	Spottail Shiner	44	14.77	1000	44
April	14	W	05/01/04	White Sucker	4	14.77	1000	4
April	14	E	05/01/04	American Eel	1	17.15	1000	1
April	14	E	05/01/04	Golden Shiner	1	17.15	1000	1
April	14	E	05/01/04	Spottail Shiner	3	17.15	1000	3
April	14	E	05/01/04	White Sucker	3	17.15	1000	3

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
April	15	W	05/01/04	Smallmouth Bass	1	15.48	1000	1
April	15	W	05/01/04	White Sucker	5	15.48	1000	5
April	15	E	05/01/04	Tessellated Darter	3	16.00	1000	3
April	16		04/30/04	Largemouth Bass	1	9.78	500	2
April	16		04/30/04	Smallmouth Bass	4	9.78	500	8
April	17		04/30/04	Largemouth Bass	1	10.13	500	2
April	18		04/30/04	Black Crappie	2	9.58	500	4
April	18		04/30/04	Bluegill	10	9.58	500	20
April	18		04/30/04	Chain Pickerel	1	9.58	500	2
April	18		04/30/04	Largemouth Bass	12	9.58	500	24
April	18		04/30/04	Pumpkinseed	2	9.58	500	4
April	18		04/30/04	Redbreast Sunfish	1	9.58	500	2
April	18		04/30/04	Rock Bass	3	9.58	500	6
April	18		04/30/04	White Sucker	6	9.58	500	12
April	18		04/30/04	Yellow Perch	3	9.58	500	6
May	11	W	05/27/04	Black Crappie	1	17.60	1000	1
May	11	W	05/27/04	Fallfish	2	17.60	1000	2
May	11	W	05/27/04	Golden Shiner	1	17.60	1000	1
May	11	W	05/27/04	Smallmouth Bass	1	17.60	1000	1
May	11	W	05/27/04	Spottail Shiner	7	17.60	1000	7
May	11	W	05/27/04	Unidentified	3	17.60	1000	3
May	11	W	05/27/04	White Sucker	1	17.60	1000	1
May	11	W	05/27/04	Yellow Perch	5	17.60	1000	5
May	11	E	05/27/04	Fallfish	1	13.10	1000	1
May	11	E	05/27/04	Spottail Shiner	1	13.10	1000	1
May	12	W	05/27/04	Bluegill	1	17.17	1000	1
May	12	W	05/27/04	Fallfish	1	17.17	1000	1
May	12	W	05/27/04	Redbreast Sunfish	1	17.17	1000	1
May	12	W	05/27/04	Smallmouth Bass	1	17.17	1000	1
May	12	E	05/27/04	Smallmouth Bass	2	18.23	1000	2
May	12	E	05/27/04	White Sucker	3	18.23	1000	3
May	13	W	05/27/04	American Eel	1	16.17	1000	1
May	13	W	05/27/04	Brown Trout	1	16.17	1000	1

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
May	13	W	05/27/04	Fallfish	3	16.17	1000	3
May	13	W	05/27/04	Golden Shiner	1	16.17	1000	1
May	13	W	05/27/04	Smallmouth Bass	1	16.17	1000	1
May	13	W	05/27/04	Spottail Shiner	13	16.17	1000	13
May	13	W	05/27/04	White Sucker	11	16.17	1000	11
May	13	W	05/27/04	Yellow Perch	1	16.17	1000	1
May	13	E	05/28/04	Fallfish	8	17.23	1000	8
May	13	E	05/28/04	White Sucker	7	17.23	1000	7
May	14	W	05/27/04	Fallfish	3	13.03	1000	3
May	14	W	05/27/04	Golden Shiner	8	13.03	1000	8
May	14	W	05/27/04	Smallmouth Bass	1	13.03	1000	1
May	14	W	05/27/04	Spottail Shiner	27	13.03	1000	27
May	14	W	05/27/04	Yellow Perch	1	13.03	1000	1
May	14	E	05/28/04	White Sucker	2	14.15	1000	2
May	15	W	05/28/04	Fallfish	2	14.98	1000	2
May	15	W	05/28/04	White Sucker	5	14.98	1000	5
May	15	E	05/28/04	White Sucker	3	12.75	1000	3
May	16		05/27/04	Bluegill	5	6.65	500	10
May	16		05/27/04	Redbreast Sunfish	3	6.65	500	6
May	16		05/27/04	Smallmouth Bass	1	6.65	500	2
May	17		05/27/04	Bluegill	3	5.77	500	6
May	17		05/27/04	Smallmouth Bass	1	5.77	500	2
May	17		05/27/04	White Sucker	3	5.77	500	6
May	18		05/27/04	Black Crappie	1	6.80	500	2
May	18		05/27/04	Bluegill	4	6.80	500	8
May	18		05/27/04	Largemouth Bass	1	6.80	500	2
May	18		05/27/04	Pumpkinseed	1	6.80	500	2
May	18		05/27/04	Redbreast Sunfish	1	6.80	500	2
May	18		05/27/04	Smallmouth Bass	3	6.80	500	6
May	18		05/27/04	White Sucker	2	6.80	500	4
June	11	W	06/28/04	Chain Pickerel	1	16.83	1000	1
June	11	W	06/28/04	Fallfish	6	16.83	1000	6
June	11	W	06/28/04	Golden Shiner	1	16.83	1000	1

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
June	11	W	06/28/04	Redbreast Sunfish	1	16.83	1000	1
June	11	W	06/28/04	Smallmouth Bass	1	16.83	1000	1
June	11	W	06/28/04	Spottail Shiner	920	16.83	1000	920
June	11	W	06/28/04	Yellow Perch	5	16.83	1000	5
June	11	E	06/28/04	Bluegill	1	19.82	1000	1
June	11	E	06/28/04	Fallfish	8	19.82	1000	8
June	11	E	06/28/04	Redbreast Sunfish	4	19.82	1000	4
June	11	E	06/28/04	Smallmouth Bass	2	19.82	1000	2
June	11	E	06/28/04	Spottail Shiner	6	19.82	1000	6
June	11	E	06/28/04	White Sucker	9	19.82	1000	9
June	12	W	06/28/04	Bluegill	1	12.72	1000	1
June	12	W	06/28/04	Chain Pickerel	1	12.72	1000	1
June	12	W	06/28/04	Fallfish	3	12.72	1000	3
June	12	W	06/28/04	Redbreast Sunfish	4	12.72	1000	4
June	12	W	06/28/04	Rock Bass	1	12.72	1000	1
June	12	W	06/28/04	Smallmouth Bass	2	12.72	1000	2
June	12	W	06/28/04	White Sucker	4	12.72	1000	4
June	12	W	06/28/04	Yellow Perch	5	12.72	1000	5
June	12	E	06/28/04	Bluegill	4	13.05	1000	4
June	12	E	06/28/04	Chain Pickerel	1	13.05	1000	1
June	12	E	06/28/04	Fallfish	1	13.05	1000	1
June	12	E	06/28/04	Pumpkinseed	1	13.05	1000	1
June	12	E	06/28/04	Redbreast Sunfish	3	13.05	1000	3
June	12	E	06/28/04	Smallmouth Bass	2	13.05	1000	2
June	12	E	06/28/04	Spottail Shiner	151	13.05	1000	151
June	12	E	06/28/04	Yellow Perch	15	13.05	1000	15
June	13	W	06/29/04	American Eel	3	15.10	1000	3
June	13	W	06/29/04	Bluegill	1	15.10	1000	1
June	13	W	06/29/04	Largemouth Bass	15	15.10	1000	15
June	13	W	06/29/04	Pumpkinseed	1	15.10	1000	1
June	13	W	06/29/04	Redbreast Sunfish	2	15.10	1000	2
June	13	W	06/29/04	Smallmouth Bass	5	15.10	1000	5
June	13	W	06/29/04	White Sucker	1	15.10	1000	1

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
June	13	W	06/29/04	Yellow Perch	2	15.10	1000	2
June	13	E	06/29/04	Bluegill	3	13.58	1000	3
June	13	E	06/29/04	Fallfish	1	13.58	1000	1
June	13	E	06/29/04	Pumpkinseed	1	13.58	1000	1
June	13	E	06/29/04	Redbreast Sunfish	3	13.58	1000	3
June	13	E	06/29/04	Smallmouth Bass	1	13.58	1000	1
June	13	E	06/29/04	Yellow Perch	1	13.58	1000	1
June	14	W	06/29/04	American Eel	1	14.92	1000	1
June	14	W	06/29/04	Black Crappie	1	14.92	1000	1
June	14	W	06/29/04	Bluegill	2	14.92	1000	2
June	14	W	06/29/04	Largemouth Bass	2	14.92	1000	2
June	14	W	06/29/04	Redbreast Sunfish	6	14.92	1000	6
June	14	E	06/27/04	Black Crappie	2	11.58	1000	2
June	14	E	06/27/04	Bluegill	1	11.58	1000	1
June	14	E	06/27/04	Largemouth Bass	2	11.58	1000	2
June	14	E	06/27/04	White Sucker	2	11.58	1000	2
June	14	E	06/27/04	Yellow Perch	1	11.58	1000	1
June	15	W	06/29/04	American Eel	1	13.58	1000	1
June	15	W	06/29/04	Bluegill	2	13.58	1000	2
June	15	W	06/29/04	Fallfish	1	13.58	1000	1
June	15	W	06/29/04	Redbreast Sunfish	2	13.58	1000	2
June	15	W	06/29/04	Smallmouth Bass	4	13.58	1000	4
June	15	W	06/29/04	White Sucker	1	13.58	1000	1
June	15	E	06/29/04	Bluegill	2	11.55	1000	2
June	15	E	06/29/04	Largemouth Bass	4	11.55	1000	4
June	15	E	06/29/04	Redbreast Sunfish	10	11.55	1000	10
June	15	E	06/29/04	Smallmouth Bass	1	11.55	1000	1
June	15	E	06/29/04	Spottail Shiner	43	11.55	1000	43
June	16		06/28/04	Largemouth Bass	1	4.42	500	2
June	17		06/28/04	Bluegill	1	3.88	500	2
June	17		06/28/04	Redbreast Sunfish	2	3.88	500	4
June	18		06/28/04	Black Crappie	3	6.30	500	6
June	18		06/28/04	Bluegill	26	6.30	500	52

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
June	18		06/28/04	Largemouth Bass	8	6.30	500	16
June	18		06/28/04	Pumpkinseed	4	6.30	500	8
June	18		06/28/04	Rock Bass	2	6.30	500	4
June	18		06/28/04	Yellow Perch	2	6.30	500	4
July	11	W	07/26/04	American Eel	1	14.95	1000	1
July	11	W	07/26/04	Bluegill	4	14.95	1000	4
July	11	W	07/26/04	Chain Pickerel	1	14.95	1000	1
July	11	W	07/26/04	Fallfish	1	14.95	1000	1
July	11	W	07/26/04	Largemouth Bass	2	14.95	1000	2
July	11	W	07/26/04	Smallmouth Bass	1	14.95	1000	1
July	11	W	07/26/04	Spottail Shiner	182	14.95	1000	182
July	11	W	07/26/04	White Sucker	1	14.95	1000	1
July	11	W	07/26/04	Yellow Perch	11	14.95	1000	11
July	11	E	07/26/04	American Eel	5	15.53	1000	5
July	11	E	07/26/04	Fallfish	2	15.53	1000	2
July	11	E	07/26/04	Pumpkinseed	1	15.53	1000	1
July	11	E	07/26/04	Redbreast Sunfish	1	15.53	1000	1
July	11	E	07/26/04	Smallmouth Bass	1	15.53	1000	1
July	11	E	07/26/04	White Sucker	2	15.53	1000	2
July	12	W	07/26/04	American Eel	1	14.67	1000	1
July	12	W	07/26/04	Bluegill	3	14.67	1000	3
July	12	W	07/26/04	Fallfish	1	14.67	1000	1
July	12	W	07/26/04	Largemouth Bass	3	14.67	1000	3
July	12	W	07/26/04	Pumpkinseed	1	14.67	1000	1
July	12	W	07/26/04	Redbreast Sunfish	1	14.67	1000	1
July	12	W	07/26/04	Spottail Shiner	2	14.67	1000	2
July	12	W	07/26/04	White Sucker	4	14.67	1000	4
July	12	W	07/26/04	Yellow Perch	1	14.67	1000	1
July	12	E	07/26/04	Bluegill	8	13.32	1000	8
July	12	E	07/26/04	Fallfish	6	13.32	1000	6
July	12	E	07/26/04	Golden Shiner	2	13.32	1000	2
July	12	E	07/26/04	Largemouth Bass	18	13.32	1000	18
July	12	E	07/26/04	Redbreast Sunfish	1	13.32	1000	1

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
July	12	E	07/26/04	Smallmouth Bass	2	13.32	1000	2
July	12	E	07/26/04	Spottail Shiner	24	13.32	1000	24
July	12	E	07/26/04	Yellow Perch	8	13.32	1000	8
July	13	W	07/27/04	Bluegill	1	11.30	1000	1
July	13	W	07/27/04	Largemouth Bass	1	11.30	1000	1
July	13	W	07/27/04	Smallmouth Bass	4	11.30	1000	4
July	13	E	07/27/04	Bluegill	1	15.82	1000	1
July	13	E	07/27/04	Largemouth Bass	11	15.82	1000	11
July	13	E	07/27/04	Pumpkinseed	3	15.82	1000	3
July	13	E	07/27/04	Redbreast Sunfish	2	15.82	1000	2
July	13	E	07/27/04	Tessellated Darter	1	15.82	1000	1
July	14	W	07/27/04	American Eel	1	14.05	1000	1
July	14	W	07/27/04	Bluegill	3	14.05	1000	3
July	14	W	07/27/04	Largemouth Bass	4	14.05	1000	4
July	14	E	07/27/04	Bluegill	1	14.08	1000	1
July	14	E	07/27/04	Chain Pickerel	1	14.08	1000	1
July	14	E	07/27/04	Largemouth Bass	7	14.08	1000	7
July	14	E	07/27/04	Redbreast Sunfish	3	14.08	1000	3
July	14	E	07/27/04	Smallmouth Bass	3	14.08	1000	3
July	14	E	07/27/04	White Sucker	2	14.08	1000	2
July	14	E	07/27/04	Yellow Perch	2	14.08	1000	2
July	15	W	07/27/04	Bluegill	1	13.35	1000	1
July	15	W	07/27/04	Largemouth Bass	8	13.35	1000	8
July	15	W	07/27/04	Redbreast Sunfish	6	13.35	1000	6
July	15	W	07/27/04	White Sucker	1	13.35	1000	1
July	15	W	07/27/04	Yellow Perch	1	13.35	1000	1
July	15	E	07/27/04	Bluegill	2	14.63	1000	2
July	15	E	07/27/04	Largemouth Bass	3	14.63	1000	3
July	15	E	07/27/04	Redbreast Sunfish	2	14.63	1000	2
July	16		07/26/04	No Fish Caught	0	4.67		0
July	17		07/26/04	No Fish Caught	0	5.12		0
July	18		07/26/04	Bluegill	15	4.47	500	30
July	18		07/26/04	Largemouth Bass	4	4.47	500	8

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
July	18		07/26/04	Pumpkinseed	9	4.47	500	18
August	11	W	08/30/04	Alewife	2	14.33	1000	2
August	11	W	08/30/04	Bluegill	1	14.33	1000	1
August	11	W	08/30/04	Common Shiner	49	14.33	1000	49
August	11	W	08/30/04	Eastern Silvery Minnow	14	14.33	1000	14
August	11	W	08/30/04	Fallfish	1	14.33	1000	1
August	11	W	08/30/04	Largemouth Bass	12	14.33	1000	12
August	11	W	08/30/04	Pumpkinseed	1	14.33	1000	1
August	11	W	08/30/04	Redbreast Sunfish	3	14.33	1000	3
August	11	W	08/30/04	Rock Bass	1	14.33	1000	1
August	11	W	08/30/04	Yellow Perch	4	14.33	1000	4
August	11	E	08/30/04	Common Shiner	2	13.33	1000	2
August	11	E	08/30/04	Fallfish	3	13.33	1000	3
August	11	E	08/30/04	Largemouth Bass	6	13.33	1000	6
August	11	E	08/30/04	Redbreast Sunfish	1	13.33	1000	1
August	11	E	08/30/04	Smallmouth Bass	2	13.33	1000	2
August	12	W	08/30/04	American Eel	1	12.67	1000	1
August	12	W	08/30/04	Bluegill	1	12.67	1000	1
August	12	W	08/30/04	Largemouth Bass	3	12.67	1000	3
August	12	W	08/30/04	Redbreast Sunfish	1	12.67	1000	1
August	12	W	08/30/04	Tessellated Darter	1	12.67	1000	1
August	12	W	08/30/04	White Sucker	3	12.67	1000	3
August	12	E	08/30/04	Alewife	67	14.15	1000	67
August	12	E	08/30/04	Bluegill	4	14.15	1000	4
August	12	E	08/30/04	Chain Pickerel	1	14.15	1000	1
August	12	E	08/30/04	Common Shiner	11	14.15	1000	11
August	12	E	08/30/04	Fallfish	18	14.15	1000	18
August	12	E	08/30/04	Golden Shiner	8	14.15	1000	8
August	12	E	08/30/04	Largemouth Bass	37	14.15	1000	37
August	12	E	08/30/04	Pumpkinseed	1	14.15	1000	1
August	12	E	08/30/04	Redbreast Sunfish	1	14.15	1000	1
August	12	E	08/30/04	Rock Bass	1	14.15	1000	1
August	12	E	08/30/04	Smallmouth Bass	1	14.15	1000	1

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
August	12	E	08/30/04	Spottail Shiner	3	14.15	1000	3
August	12	E	08/30/04	White Sucker	1	14.15	1000	1
August	12	E	08/30/04	Yellow Perch	5	14.15	1000	5
August	13	W	08/30/04	Largemouth Bass	7	11.93	1000	7
August	13	W	08/30/04	Redbreast Sunfish	2	11.93	1000	2
August	13	W	08/30/04	Smallmouth Bass	7	11.93	1000	7
August	13	E	08/30/04	Bluegill	1	14.50	1000	1
August	13	E	08/30/04	Fallfish	2	14.50	1000	2
August	13	E	08/30/04	Largemouth Bass	13	14.50	1000	13
August	13	E	08/30/04	Pumpkinseed	5	14.50	1000	5
August	13	E	08/30/04	Redbreast Sunfish	9	14.50	1000	9
August	13	E	08/30/04	Smallmouth Bass	1	14.50	1000	1
August	14	W	08/30/04	Largemouth Bass	2	15.68	1000	2
August	14	W	08/30/04	Pumpkinseed	3	15.68	1000	3
August	14	W	08/30/04	Redbreast Sunfish	6	15.68	1000	6
August	14	W	08/30/04	Smallmouth Bass	9	15.68	1000	9
August	14	E	08/30/04	Black Crappie	1	14.02	1000	1
August	14	E	08/30/04	Largemouth Bass	7	14.02	1000	7
August	14	E	08/30/04	Pumpkinseed	1	14.02	1000	1
August	14	E	08/30/04	Redbreast Sunfish	4	14.02	1000	4
August	14	E	08/30/04	Smallmouth Bass	3	14.02	1000	3
August	15	W	08/31/04	Alewife	5	13.20	1000	5
August	15	W	08/31/04	Largemouth Bass	9	13.20	1000	9
August	15	W	08/31/04	Redbreast Sunfish	5	13.20	1000	5
August	15	E	08/31/04	Bluegill	12	15.27	1000	12
August	15	E	08/31/04	Chain Pickerel	1	15.27	1000	1
August	15	E	08/31/04	Largemouth Bass	12	15.27	1000	12
August	15	E	08/31/04	Redbreast Sunfish	16	15.27	1000	16
August	15	E	08/31/04	Smallmouth Bass	1	15.27	1000	1
August	15	E	08/31/04	Yellow Perch	2	15.27	1000	2
August	16		08/31/04	No Fish Caught	0	5.85		0
August	17		08/31/04	No Fish Caught	0	5.08		0
August	18		08/31/04	Bluegill	5	7.15	500	10

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
August	18		08/31/04	Largemouth Bass	2	7.15	500	4
August	18		08/31/04	Pumpkinseed	13	7.15	500	26
August	18		08/31/04	Redbreast Sunfish	1	7.15	500	2
September	11	W	09/27/04	Alewife	1	14.23	1000	1
September	11	W	09/27/04	Chain Pickerel	1	14.23	1000	1
September	11	W	09/27/04	Golden Shiner	2	14.23	1000	2
September	11	W	09/27/04	Largemouth Bass	2	14.23	1000	2
September	11	W	09/27/04	Smallmouth Bass	4	14.23	1000	4
September	11	W	09/27/04	Spottail Shiner	150	14.23	1000	150
September	11	W	09/27/04	White Sucker	1	14.23	1000	1
September	11	W	09/27/04	Yellow Perch	1	14.23	1000	1
September	11	E	09/27/04	American Eel	1	14.23	1000	1
September	11	E	09/27/04	Bluegill	1	14.23	1000	1
September	11	E	09/27/04	Fallfish	3	14.23	1000	3
September	11	E	09/27/04	Golden Shiner	8	14.23	1000	8
September	11	E	09/27/04	Redbreast Sunfish	2	14.23	1000	2
September	11	E	09/27/04	Rock Bass	2	14.23	1000	2
September	11	E	09/27/04	Smallmouth Bass	4	14.23	1000	4
September	11	E	09/27/04	Spottail Shiner	113	14.23	1000	113
September	11	E	09/27/04	White Sucker	4	14.23	1000	4
September	12	W	09/27/04	American Eel	1	16.08	1000	1
September	12	W	09/27/04	Bluegill	3	16.08	1000	3
September	12	W	09/27/04	Largemouth Bass	5	16.08	1000	5
September	12	W	09/27/04	Redbreast Sunfish	2	16.08	1000	2
September	12	W	09/27/04	Smallmouth Bass	26	16.08	1000	26
September	12	W	09/27/04	Tessellated Darter	1	16.08	1000	1
September	12	W	09/27/04	Yellow Perch	1	16.08	1000	1
September	12	E	09/27/04	Alewife	5	12.52	1000	5
September	12	E	09/27/04	Bluegill	12	12.52	1000	12
September	12	E	09/27/04	Fallfish	1	12.52	1000	1
September	12	E	09/27/04	Golden Shiner	9	12.52	1000	9
September	12	E	09/27/04	Largemouth Bass	13	12.52	1000	13
September	12	E	09/27/04	Pumpkinseed	1	12.52	1000	1

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
September	12	E	09/27/04	Smallmouth Bass	32	12.52	1000	32
September	12	E	09/27/04	Spottail Shiner	5	12.52	1000	5
September	12	E	09/27/04	Tessellated Darter	1	12.52	1000	1
September	12	E	09/27/04	White Sucker	5	12.52	1000	5
September	13	W	09/27/04	Largemouth Bass	9	10.60	1000	9
September	13	W	09/27/04	Smallmouth Bass	12	10.60	1000	12
September	13	W	09/27/04	Tessellated Darter	1	10.60	1000	1
September	13	E	09/29/04	Bluegill	3	11.47	1000	3
September	13	E	09/29/04	Fallfish	1	11.47	1000	1
September	13	E	09/29/04	Largemouth Bass	12	11.47	1000	12
September	14	W	09/29/04	Bluegill	18	11.08	1000	18
September	14	W	09/29/04	Largemouth Bass	15	11.08	1000	15
September	14	W	09/29/04	Pumpkinseed	1	11.08	1000	1
September	14	W	09/29/04	Smallmouth Bass	2	11.08	1000	2
September	14	E	09/29/04	American Eel	1	11.70	1000	1
September	14	E	09/29/04	Bluegill	6	11.70	1000	6
September	14	E	09/29/04	Largemouth Bass	10	11.70	1000	10
September	14	E	09/29/04	Pumpkinseed	1	11.70	1000	1
September	14	E	09/29/04	Redbreast Sunfish	1	11.70	1000	1
September	14	E	09/29/04	Smallmouth Bass	3	11.70	1000	3
September	15	W	09/29/04	No Fish Caught	0	10.55		0
September	15	E	09/29/04	Bluegill	2	12.82	1000	2
September	15	E	09/29/04	Largemouth Bass	17	12.82	1000	17
September	15	E	09/29/04	White Sucker	1	12.82	1000	1
September	16		9/27/04	NO SAMPLE		Dredging		
September	17		09/27/04	No Fish Caught	0	4.33		0
September	18		09/27/04	American Eel	1	5.88	500	2
September	18		09/27/04	Black Crappie	1	5.88	500	2
September	18		09/27/04	Bluegill	9	5.88	500	18
September	18		09/27/04	Largemouth Bass	19	5.88	500	38
September	18		09/27/04	Pumpkinseed	1	5.88	500	2
September	18		09/27/04	Rock Bass	1	5.88	500	2
September	18		09/27/04	Smallmouth Bass	12	5.88	500	24
October	11	W	10/18/04	Largemouth Bass	1	13.00	1000	1

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
October	11	W	10/18/04	Tessellated Darter	1	13.00	1000	1
October	11	E	10/18/04	White Sucker	1	12.62	1000	1
October	12	W	10/18/04	Pumpkinseed	1	14.20	1000	1
October	12	W	10/18/04	Smallmouth Bass	1	14.20	1000	1
October	12	E	10/18/04	Bluegill	8	13.05	1000	8
October	12	E	10/18/04	Chain Pickerel	1	13.05	1000	1
October	12	E	10/18/04	Common Shiner	3	13.05	1000	3
October	12	E	10/18/04	Golden Shiner	5	13.05	1000	5
October	12	E	10/18/04	Largemouth Bass	40	13.05	1000	40
October	12	E	10/18/04	Rock Bass	1	13.05	1000	1
October	12	E	10/18/04	Spottail Shiner	4	13.05	1000	4
October	12	E	10/18/04	White Sucker	6	13.05	1000	6
October	13	W	10/22/04	American Eel	1	11.25	1000	1
October	13	W	10/22/04	Largemouth Bass	1	11.25	1000	1
October	13	E	10/22/04	Smallmouth Bass	1	9.33	1000	1
October	14	W	10/22/04	Largemouth Bass	4	11.07	1000	4
October	14	W	10/22/04	White Sucker	1	11.07	1000	1
October	14	E	10/22/04	Largemouth Bass	2	11.12	1000	2
October	14	E	10/22/04	Smallmouth Bass	1	11.12	1000	1
October	15	W	10/22/04	Alewife	1	9.72	1000	1
October	15	E	10/22/04	No Fish Caught	0	9.30		0
October	16		10/18/04	NO SAMPLE		Dredging		
October	17		10/18/04	No Fish Caught	0	4.97		0
October	18		10/18/04	Black Crappie	1	6.37	500	2
October	18		10/18/04	Bluegill	12	6.37	500	24
October	18		10/18/04	Largemouth Bass	17	6.37	500	34
October	18		10/18/04	Pumpkinseed	1	6.37	500	2
October	18		10/18/04	Redbreast Sunfish	1	6.37	500	2
October	18		10/18/04	Rock Bass	2	6.37	500	4
December	11	W	12/16/04	Spottail Shiner	1	11.18	1000	1
December	11	E	12/16/04	Spottail Shiner	1	10.52	1000	1
December	12	W	12/16/04	Smallmouth Bass	1	12.50	1000	1
December	12	E	12/16/04	Margined Madtom	1	12.75	1000	1
December	12	E	12/16/04	Spottail Shiner	2	12.75	1000	2

(continued)

Appendix Table A-2. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
December	13	W	12/17/04	Largemouth Bass	3	12.58	1000	3
December	13	W	12/17/04	Margined Madtom	1	12.58	1000	1
December	13	W	12/17/04	Smallmouth Bass	2	12.58	1000	2
December	13	W	12/17/04	Spottail Shiner	92	12.58	1000	92
December	13	W	12/17/04	Tessellated Darter	1	12.58	1000	1
December	13	E	12/17/04	NO SAMPLE		Ice		
December	14	W	12/17/04	Bluegill	4	11.97	1000	4
December	14	W	12/17/04	Golden Shiner	4	11.97	1000	4
December	14	W	12/17/04	Largemouth Bass	2	11.97	1000	2
December	14	W	12/17/04	Margined Madtom	1	11.97	1000	1
December	14	W	12/17/04	Spottail Shiner	8	11.97	1000	8
December	14	E	12/17/04	NO SAMPLE		Ice		
December	15	W	12/17/04	Golden Shiner	1	11.23	1000	1
December	15	E	12/16/04	NO SAMPLE		Ice		
December	16		12/16/04	Bluegill	2	7.25	500	4
December	16		12/16/04	Chain Pickerel	1	7.25	500	2
December	16		12/16/04	Largemouth Bass	13	7.25	500	26
December	16		12/16/04	Smallmouth Bass	14	7.25	500	28
December	17		12/16/04	Atlantic Salmon	1	6.28	500	2
December	17		12/16/04	Bluegill	5	6.28	500	10
December	17		12/16/04	Yellow Perch	1	6.28	500	2
December	18		12/16/04	American Eel	2	6.47	500	4
December	18		12/16/04	Bluegill	6	6.47	500	12
December	18		12/16/04	Largemouth Bass	9	6.47	500	18
December	18		12/16/04	Pumpkinseed	1	6.47	500	2
December	18		12/16/04	Yellow Perch	1	6.47	500	2

Appendix Table A-3. Total 2005 catch for 3/4-inch mesh trapnet sorted by month, station, site and date.

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
April	1	W	04/25/05	NO SAMPLE		High Flow	
April	1	E	04/25/05	NO SAMPLE		High Flow	
April	2	W	04/25/05	NO SAMPLE		High Flow	
April	3	E	04/25/05	NO SAMPLE		High Flow	
April	4		04/25/05	Black Crappie	3	49.83	2.89
April	5		04/25/05	Rock Bass	1	49.75	0.96
April	5		04/25/05	Smallmouth Bass	1	49.75	0.96
May	1	W	05/23/05	No Fish Caught	0	48.32	0.00
May	1	W	05/25/05	No Fish Caught	0	47.05	0.00
May	1	E	05/23/05	Eastern Silvery Minnow	2	47.93	2.00
May	1	E	05/23/05	Spottail Shiner	2	47.93	2.00
May	1	E	05/23/05	White Sucker	2	47.93	2.00
May	1	E	05/25/05	No Fish Caught	0	46.95	0.00
May	2	W	05/23/05	Smallmouth Bass	1	47.73	1.01
May	2	W	05/25/05	No Fish Caught	0	45.83	0.00
May	3	E	05/23/05	Smallmouth Bass	1	48.62	0.99
May	3	E	05/25/05	No Fish Caught	0	45.95	0.00
May	4		05/23/05	Bluegill	2	45.85	2.09
May	4		05/23/05	Smallmouth Bass	2	45.85	2.09
May	4		05/25/05	Black Crappie	4	48.13	3.99
May	4		05/25/05	Bluegill	2	48.13	1.99
May	4		05/25/05	Smallmouth Bass	1	48.13	1.00
May	5		05/23/05	Smallmouth Bass	1	45.97	1.04
May	5		05/25/05	Bluegill	1	48.65	0.99
May	5		05/25/05	Smallmouth Bass	2	48.65	1.97
June	1	W	06/20/05	Smallmouth Bass	3	46.40	3.10
June	1	W	06/22/05	Redbreast Sunfish	2	50.78	1.89
June	1	W	06/22/05	Rock Bass	2	50.78	1.89
June	1	W	06/22/05	Smallmouth Bass	1	50.78	0.95
June	1	W	06/22/05	Spottail Shiner	1	50.78	0.95
June	1	W	06/22/05	Tessellated Darter	1	50.78	0.95
June	1	W	06/22/05	White Sucker	2	50.78	1.89
June	1	E	06/20/05	No Fish Caught	0	46.62	0.00
June	1	E	06/22/05	No Fish Caught	0	50.00	0.00
June	2	W	06/20/05	No Fish Caught	0	50.25	0.00
June	2	W	06/22/05	Redbreast Sunfish	1	45.72	1.05
June	3	E	06/20/05	No Fish Caught	0	51.18	0.00
June	3	E	06/22/05	Margined Madtom	2	45.55	2.11
June	3	E	06/22/05	Redbreast Sunfish	14	45.55	14.75

(continued)

Appendix Table A-3. Continued)

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
June	3	E	06/22/05	Smallmouth Bass	7	45.55	7.38
June	3	E	06/22/05	Yellow Perch	2	45.55	2.11
June	4		06/20/05	Bluegill	1	46.22	1.04
June	4		06/20/05	Smallmouth Bass	1	46.22	1.04
June	4		06/22/05	Smallmouth Bass	2	48.15	1.99
June	5		06/20/05	Smallmouth Bass	2	46.20	2.08
June	5		06/22/05	Bluegill	2	48.25	1.99
June	5		06/22/05	Smallmouth Bass	1	48.25	0.99
July	1	W	07/18/05	Bluegill	2	48.00	2.00
July	1	W	07/18/05	Rock Bass	1	48.00	1.00
July	1	W	07/20/05	No Fish Caught	0	46.48	0.00
July	1	E	07/18/05	Smallmouth Bass	2	47.92	2.00
July	1	E	07/20/05	Redbreast Sunfish	1	46.98	1.02
July	1	E	07/20/05	Rock Bass	2	46.98	2.04
July	1	E	07/20/05	Smallmouth Bass	2	46.98	2.04
July	2	W	07/18/05	Rock Bass	2	48.17	1.99
July	2	W	07/18/05	Smallmouth Bass	12	48.17	11.96
July	2	W	07/26/05	Bluegill	1	48.23	1.00
July	2	W	07/26/05	Redbreast Sunfish	2	48.23	1.99
July	2	W	07/26/05	Rock Bass	1	48.23	1.00
July	2	W	07/26/05	Smallmouth Bass	4	48.23	3.98
July	3	E	07/18/05	No Fish Caught	0	47.42	0.00
July	3	E	07/20/05	No Fish Caught	0	47.88	0.00
July	3	E	07/25/05	Bluegill	1	45.67	1.05
July	4		07/18/05	No Fish Caught	0	48.08	0.00
July	4		07/20/05	No Fish Caught	0	46.62	0.00
July	5		07/18/05	Smallmouth Bass	1	48.08	1.00
July	5		07/18/05	White Perch	1	48.08	1.00
July	5		07/20/05	No Fish Caught	0	46.55	0.00
August	1	W	08/15/05	No Fish Caught	0	45.83	0.00
August	1	W	08/17/05	No Fish Caught	0	49.58	0.00
August	1	E	08/15/05	Bluegill	1	46.58	1.03
August	1	E	08/15/05	Rock Bass	1	46.58	1.03
August	1	E	08/15/05	Smallmouth Bass	5	46.58	5.15
August	1	E	08/17/05	Smallmouth Bass	3	49.22	2.93
August	2	W	08/15/05	Bluegill	1	49.75	0.96
August	2	W	08/15/05	Redbreast Sunfish	2	49.75	1.93
August	2	W	08/15/05	Rock Bass	1	49.75	0.96
August	2	W	08/15/05	Smallmouth Bass	8	49.75	7.72
August	2	W	08/17/05	Bluegill	1	44.98	1.07

(continued)

Appendix Table A-3. Continued)

Month	Station	Site	Set Date	Common Name	Count	Effort (hours)	CPUE (#/48-hr)
August	2	W	08/17/05	Rock Bass	1	44.98	1.07
August	2	W	08/17/05	Smallmouth Bass	18	44.98	19.21
August	3	E	08/15/05	Bluegill	1	50.50	0.95
August	3	E	08/15/05	Redbreast Sunfish	1	50.50	0.95
August	3	E	08/15/05	Smallmouth Bass	1	50.50	0.95
August	3	E	08/17/05	Smallmouth Bass	1	44.87	1.07
August	4		08/15/05	No Fish Caught	0	48.25	0.00
August	4		08/17/05	No Fish Caught	0	47.00	0.00
August	5		08/15/05	Smallmouth Bass	8	48.00	8.00
August	5		08/17/05	Smallmouth Bass	5	47.25	5.08
September	1	W	09/12/05	No Fish Caught	0	48.42	0.00
September	1	W	09/14/05	No Fish Caught	0	43.03	0.00
September	1	E	09/12/05	Smallmouth Bass	1	48.97	0.98
September	1	E	09/14/05	No Fish Caught	0	43.12	0.00
September	2	W	09/12/05	Black Crappie	1	48.37	0.99
September	2	W	09/12/05	Bluegill	4	48.37	3.97
September	2	W	09/12/05	Smallmouth Bass	3	48.37	2.98
September	2	W	09/14/05	Bluegill	1	42.42	1.13
September	2	W	09/14/05	Smallmouth Bass	1	42.42	1.13
September	3	E	09/12/05	No Fish Caught	0	48.83	0.00
September	3	E	09/14/05	No Fish Caught	0	42.38	0.00
September	4		09/12/05	No Fish Caught	0	46.53	0.00
September	4		09/14/05	Pumpkinseed	2	44.48	2.16
September	4		09/14/05	Redbreast Sunfish	1	44.48	1.08
September	5		09/12/05	Smallmouth Bass	21	46.30	21.77
September	5		09/14/05	Sunfish Family	1	44.65	1.08

Appendix Table A-4. Total 2005 catch for electrofishing sorted by month, station, site and date.

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
April	11	W	04/19/05	Smallmouth Bass	1	10.68	1000	1
April	11	E	04/19/05	No Fish Caught	0	9.67		0
April	12	W	04/19/05	Tessellated Darter	2	11.77	1000	2
April	12	E	04/19/05	Spottail Shiner	1	10.73	1000	1
April	12	E	04/19/05	White Sucker	1	10.73	1000	1
April	12	E	04/19/05	Yellow Perch	1	10.73	1000	1
April	13	W	04/19/05	Golden Shiner	1	8.43	1000	1
April	13	W	04/19/05	Smallmouth Bass	1	8.43	1000	1
April	13	W	04/19/05	Spottail Shiner	2	8.43	1000	2
April	13	E	04/20/05	Margined Madtom	2	12.83	1000	2
April	13	E	04/20/05	Spottail Shiner	1	12.83	1000	1
April	13	E	04/20/05	Tessellated Darter	5	12.83	1000	5
April	14	W	04/20/05	Spottail Shiner	18	10.07	1000	18
April	14	E	04/20/05	Spottail Shiner	1	10.77	1000	1
April	15	W	04/20/05	Smallmouth Bass	1	10.48	1000	1
April	15	W	04/20/05	Spottail Shiner	1	10.48	1000	1
April	15	W	04/20/05	White Sucker	3	10.48	1000	3
April	15	E	04/20/05	Tessellated Darter	1	10.27	1000	1
April	16		04/19/05	Bluegill	2	4.87	500	4
April	16		04/19/05	Largemouth Bass	2	4.87	500	4
April	16		04/19/05	Smallmouth Bass	4	4.87	500	8
April	16		04/19/05	White Sucker	2	4.87	500	4
April	17		04/19/05	Largemouth Bass	1	4.53	500	2
April	18		04/19/05	American Eel	1	7.75	500	2
April	18		04/19/05	Black Crappie	8	7.75	500	16
April	18		04/19/05	Bluegill	2	7.75	500	4
April	18		04/19/05	Largemouth Bass	3	7.75	500	6
April	18		04/19/05	Pumpkinseed	1	7.75	500	2
April	18		04/19/05	Rock Bass	2	7.75	500	4
April	18		04/19/05	Tessellated Darter	1	7.75	500	2
April	18		04/19/05	White Sucker	2	7.75	500	4
April	18		04/19/05	Yellow Perch	5	7.75	500	10

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
May	11	W	05/18/05	Fallfish	1	13.83	1000	1
May	11	W	05/18/05	Golden Shiner	1	13.83	1000	1
May	11	W	05/18/05	Spottail Shiner	27	13.83	1000	27
May	11	W	05/18/05	White Sucker	7	13.83	1000	7
May	11	W	05/18/05	Yellow Perch	1	13.83	1000	1
May	11	E	05/18/05	Fallfish	1	13.70	1000	1
May	11	E	05/18/05	Tessellated Darter	6	13.70	1000	6
May	11	E	05/18/05	White Sucker	1	13.70	1000	1
May	11	E	05/18/05	Yellow Perch	1	13.70	1000	1
May	12	W	05/18/05	American Eel	1	13.12	1000	1
May	12	W	05/18/05	White Sucker	2	13.12	1000	2
May	12	E	05/18/05	Bluegill	1	13.45	1000	1
May	12	E	05/18/05	Fallfish	2	13.45	1000	2
May	12	E	05/18/05	Spottail Shiner	2	13.45	1000	2
May	12	E	05/18/05	White Sucker	7	13.45	1000	7
May	12	E	05/18/05	Yellow Perch	1	13.45	1000	1
May	13	W	05/19/05	Redbreast Sunfish	1	11.20	1000	1
May	13	W	05/19/05	Smallmouth Bass	2	11.20	1000	2
May	13	E	05/19/05	American Eel	1	10.78	1000	1
May	13	E	05/19/05	Largemouth Bass	1	10.78	1000	1
May	13	E	05/19/05	Spottail Shiner	18	10.78	1000	18
May	13	E	05/19/05	White Sucker	1	10.78	1000	1
May	14	W	05/19/05	Brown Trout	1	11.50	1000	1
May	14	W	05/19/05	Spottail Shiner	30	11.50	1000	30
May	14	W	05/19/05	White Sucker	5	11.50	1000	5
May	14	E	05/19/05	White Sucker	3	13.38	1000	3
May	15	W	05/19/05	White Sucker	1	11.67	1000	1
May	15	E	05/19/05	Tessellated Darter	2	11.08	1000	2
May	16		05/18/05	Bluegill	3	5.13	500	6
May	16		05/18/05	Redbreast Sunfish	1	5.13	500	2
May	16		05/18/05	Spottail Shiner	2	5.13	500	4
May	17		05/18/05	Bluegill	1	4.77	500	2
May	17		05/18/05	Largemouth Bass	2	4.77	500	4

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
May	18		05/19/05	American Eel	1	7.85	500	2
May	18		05/19/05	Bluegill	3	7.85	500	6
May	18		05/19/05	Largemouth Bass	8	7.85	500	16
May	18		05/19/05	Yellow Perch	1	7.85	500	2
June	11	W	06/29/05	American Eel	1	11.68	1000	1
June	11	W	06/29/05	Fallfish	3	11.68	1000	3
June	11	W	06/29/05	Redbreast Sunfish	1	11.68	1000	1
June	11	W	06/29/05	Smallmouth Bass	1	11.68	1000	1
June	11	W	06/29/05	Spottail Shiner	4	11.68	1000	4
June	11	W	06/29/05	White Sucker	3	11.68	1000	3
June	11	W	06/29/05	Yellow Perch	1	11.68	1000	1
June	11	E	06/29/05	American Eel	1	12.32	1000	1
June	11	E	06/29/05	Fallfish	4	12.32	1000	4
June	11	E	06/29/05	Largemouth Bass	1	12.32	1000	1
June	11	E	06/29/05	Redbreast Sunfish	1	12.32	1000	1
June	11	E	06/29/05	Smallmouth Bass	2	12.32	1000	2
June	11	E	06/29/05	Spottail Shiner	3	12.32	1000	3
June	11	E	06/29/05	White Sucker	2	12.32	1000	2
June	12	W	06/29/05	American Eel	1	11.42	1000	1
June	12	W	06/29/05	Largemouth Bass	1	11.42	1000	1
June	12	W	06/29/05	Redbreast Sunfish	3	11.42	1000	3
June	12	W	06/29/05	Smallmouth Bass	1	11.42	1000	1
June	12	W	06/29/05	White Sucker	2	11.42	1000	2
June	12	W	06/29/05	Yellow Perch	2	11.42	1000	2
June	12	E	06/30/05	Bluegill	1	12.68	1000	1
June	12	E	06/30/05	Eastern Silvery Minnow	1	12.68	1000	1
June	12	E	06/30/05	White Sucker	4	12.68	1000	4
June	13	W	06/30/05	Black Crappie	1	12.63	1000	1
June	13	W	06/30/05	Bluegill	1	12.63	1000	1
June	13	W	06/30/05	Largemouth Bass	1	12.63	1000	1
June	13	W	06/30/05	Redbreast Sunfish	1	12.63	1000	1
June	13	W	06/30/05	Spottail Shiner	3	12.63	1000	3

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
June	13	W	06/30/05	White Sucker	30	12.63	1000	30
June	13	E	06/30/05	Bluegill	3	9.12	1000	3
June	13	E	06/30/05	Eastern Silvery Minnow	3	9.12	1000	3
June	13	E	06/30/05	Redbreast Sunfish	2	9.12	1000	2
June	13	E	06/30/05	Smallmouth Bass	4	9.12	1000	4
June	13	E	06/30/05	White Sucker	6	9.12	1000	6
June	13	E	06/30/05	Yellow Perch	1	9.12	1000	1
June	14	W	06/30/05	Golden Shiner	3	10.22	1000	3
June	14	W	06/30/05	Pumpkinseed	1	10.22	1000	1
June	14	W	06/30/05	Redbreast Sunfish	2	10.22	1000	2
June	14	W	06/30/05	Spottail Shiner	2	10.22	1000	2
June	14	W	06/30/05	White Sucker	7	10.22	1000	7
June	14	E	06/30/05	Golden Shiner	3	9.25	1000	3
June	14	E	06/30/05	White Sucker	4	9.25	1000	4
June	15	W	06/30/05	White Sucker	1	9.72	1000	1
June	15	E	06/30/05	Golden Shiner	1	9.02	1000	1
June	15	E	06/30/05	Redbreast Sunfish	4	9.02	1000	4
June	15	E	06/30/05	Smallmouth Bass	1	9.02	1000	1
June	15	E	06/30/05	White Sucker	9	9.02	1000	9
June	16		06/30/05	No Fish Caught	0	5.28		0
June	17		06/30/05	No Fish Caught	0	6.65		0
June	18		06/30/05	Bluegill	4	6.35	500	8
June	18		06/30/05	Largemouth Bass	3	6.35	500	6
June	18		06/30/05	Smallmouth Bass	3	6.35	500	6
June	18		06/30/05	Spottail Shiner	1	6.35	500	2
July	11	W	07/25/05	Bluegill	1	10.37	1000	1
July	11	W	07/25/05	Common Carp	1	10.37	1000	1
July	11	W	07/25/05	Largemouth Bass	2	10.37	1000	2
July	11	W	07/25/05	Redbreast Sunfish	1	10.37	1000	1
July	11	W	07/25/05	Smallmouth Bass	1	10.37	1000	1
July	11	W	07/25/05	White Sucker	1	10.37	1000	1
July	11	W	07/25/05	Yellow Perch	2	10.37	1000	2

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
July	11	E	07/25/05	Largemouth Bass	1	10.78	1000	1
July	11	E	07/25/05	White Sucker	1	10.78	1000	1
July	12	W	07/25/05	Fallfish	1	12.83	1000	1
July	12	W	07/25/05	Spottail Shiner	2	12.83	1000	2
July	12	W	07/25/05	White Sucker	8	12.83	1000	8
July	12	E	07/26/05	Bluegill	5	12.52	1000	5
July	12	E	07/26/05	Fallfish	2	12.52	1000	2
July	12	E	07/26/05	Largemouth Bass	3	12.52	1000	3
July	12	E	07/26/05	Pumpkinseed	2	12.52	1000	2
July	12	E	07/26/05	Redbreast Sunfish	3	12.52	1000	3
July	12	E	07/26/05	Smallmouth Bass	3	12.52	1000	3
July	12	E	07/26/05	Spottail Shiner	2	12.52	1000	2
July	12	E	07/26/05	White Sucker	1	12.52	1000	1
July	12	E	07/26/05	Yellow Perch	6	12.52	1000	6
July	13	W	07/25/05	American Eel	3	10.12	1000	3
July	13	W	07/25/05	Smallmouth Bass	4	10.12	1000	4
July	13	E	07/25/05	Smallmouth Bass	1	9.83	1000	1
July	14	W	07/25/05	Bluegill	2	12.67	1000	2
July	14	W	07/25/05	Pumpkinseed	1	12.67	1000	1
July	14	W	07/25/05	Redbreast Sunfish	7	12.67	1000	7
July	14	W	07/25/05	Smallmouth Bass	6	12.67	1000	6
July	14	W	07/25/05	Yellow Perch	1	12.67	1000	1
July	14	E	07/25/05	Black Crappie	1	8.13	1000	1
July	14	E	07/25/05	Bluegill	1	8.13	1000	1
July	14	E	07/25/05	Largemouth Bass	2	8.13	1000	2
July	14	E	07/25/05	Pumpkinseed	1	8.13	1000	1
July	14	E	07/25/05	Redbreast Sunfish	2	8.13	1000	2
July	15	W	07/26/05	Bluegill	3	12.03	1000	3
July	15	W	07/26/05	Largemouth Bass	1	12.03	1000	1
July	15	W	07/26/05	Redbreast Sunfish	6	12.03	1000	6
July	15	W	07/26/05	Smallmouth Bass	1	12.03	1000	1
July	15	E	07/25/05	Bluegill	2	10.62	1000	2
July	15	E	07/25/05	Largemouth Bass	2	10.62	1000	2

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
July	15	E	07/25/05	Pumpkinseed	2	10.62	1000	2
July	15	E	07/25/05	Redbreast Sunfish	12	10.62	1000	12
July	15	E	07/25/05	Yellow Perch	1	10.62	1000	1
July	16		07/26/05	No Fish Caught	0	4.52		0
July	17		07/26/05	No Fish Caught	0	5.00		0
July	18		07/26/05	Bluegill	6	6.53	500	12
July	18		07/26/05	Pumpkinseed	4	6.53	500	8
July	18		07/26/05	Redbreast Sunfish	1	6.53	500	2
August	11	W	08/22/05	American Eel	1	10.28	1000	1
August	11	W	08/22/05	Bluegill	8	10.28	1000	8
August	11	W	08/22/05	Chain Pickerel	1	10.28	1000	1
August	11	W	08/22/05	Fallfish	3	10.28	1000	3
August	11	W	08/22/05	Golden Shiner	2	10.28	1000	2
August	11	W	08/22/05	Largemouth Bass	3	10.28	1000	3
August	11	W	08/22/05	Pumpkinseed	2	10.28	1000	2
August	11	W	08/22/05	Redbreast Sunfish	1	10.28	1000	1
August	11	W	08/22/05	Smallmouth Bass	2	10.28	1000	2
August	11	W	08/22/05	Spottail Shiner	1	10.28	1000	1
August	11	W	08/22/05	White Sucker	1	10.28	1000	1
August	11	W	08/22/05	Yellow Perch	4	10.28	1000	4
August	11	E	08/22/05	Fallfish	2	9.62	1000	2
August	11	E	08/22/05	White Sucker	1	9.62	1000	1
August	12	W	08/22/05	Bluegill	2	10.83	1000	2
August	12	W	08/22/05	Fallfish	1	10.83	1000	1
August	12	W	08/22/05	Redbreast Sunfish	2	10.83	1000	2
August	12	W	08/22/05	Smallmouth Bass	1	10.83	1000	1
August	12	W	08/22/05	White Sucker	4	10.83	1000	4
August	12	E	08/22/05	Bluegill	5	10.12	1000	5
August	12	E	08/22/05	Fallfish	1	10.12	1000	1
August	12	E	08/22/05	Largemouth Bass	8	10.12	1000	8
August	12	E	08/22/05	Redbreast Sunfish	1	10.12	1000	1
August	12	E	08/22/05	Smallmouth Bass	2	10.12	1000	2
August	12	E	08/22/05	White Sucker	1	10.12	1000	1

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
August	12	E	08/22/05	Yellow Perch	10	10.12	1000	10
August	13	W	08/22/05	Bluegill	5	10.23	1000	5
August	13	W	08/22/05	Largemouth Bass	3	10.23	1000	3
August	13	W	08/22/05	Pumpkinseed	2	10.23	1000	2
August	13	W	08/22/05	Redbreast Sunfish	2	10.23	1000	2
August	13	W	08/22/05	Smallmouth Bass	2	10.23	1000	2
August	13	E	08/22/05	Bluegill	6	8.90	1000	6
August	13	E	08/22/05	Fallfish	1	8.90	1000	1
August	13	E	08/22/05	Largemouth Bass	2	8.90	1000	2
August	13	E	08/22/05	Pumpkinseed	4	8.90	1000	4
August	13	E	08/22/05	Redbreast Sunfish	4	8.90	1000	4
August	13	E	08/22/05	Smallmouth Bass	1	8.90	1000	1
August	14	W	08/22/05	Bluegill	3	9.22	1000	3
August	14	W	08/22/05	Largemouth Bass	2	9.22	1000	2
August	14	W	08/22/05	Redbreast Sunfish	3	9.22	1000	3
August	14	W	08/22/05	Smallmouth Bass	2	9.22	1000	2
August	14	E	08/22/05	Bluegill	9	10.98	1000	9
August	14	E	08/22/05	Fallfish	1	10.98	1000	1
August	14	E	08/22/05	Largemouth Bass	6	10.98	1000	6
August	14	E	08/22/05	Pumpkinseed	1	10.98	1000	1
August	14	E	08/22/05	Redbreast Sunfish	1	10.98	1000	1
August	14	E	08/22/05	Smallmouth Bass	4	10.98	1000	4
August	14	E	08/22/05	Yellow Perch	2	10.98	1000	2
August	15	W	08/22/05	Bluegill	3	10.82	1000	3
August	15	W	08/22/05	Largemouth Bass	1	10.82	1000	1
August	15	W	08/22/05	Smallmouth Bass	3	10.82	1000	3
August	15	W	08/22/05	White Sucker	1	10.82	1000	1
August	15	E	08/22/05	Bluegill	8	11.68	1000	8
August	15	E	08/22/05	Chain Pickerel	1	11.68	1000	1
August	15	E	08/22/05	Largemouth Bass	10	11.68	1000	10
August	15	E	08/22/05	Pumpkinseed	2	11.68	1000	2
August	15	E	08/22/05	Redbreast Sunfish	4	11.68	1000	4
August	15	E	08/22/05	Smallmouth Bass	1	11.68	1000	1

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
August	15	E	08/22/05	Yellow Perch	4	11.68	1000	4
August	16		08/22/05	No Fish Caught	0	3.83		0
August	17		08/22/05	Redbreast Sunfish	1	4.33	500	2
August	18		08/22/05	Bluegill	5	5.33	500	10
August	18		08/22/05	Largemouth Bass	1	5.33	500	2
August	18		08/22/05	Smallmouth Bass	2	5.33	500	4
September	11	W	09/26/05	Black Crappie	2	10.42	1000	2
September	11	W	09/26/05	Bluegill	10	10.42	1000	10
September	11	W	09/26/05	Fallfish	2	10.42	1000	2
September	11	W	09/26/05	Largemouth Bass	28	10.42	1000	28
September	11	W	09/26/05	Pumpkinseed	1	10.42	1000	1
September	11	W	09/26/05	Yellow Perch	21	10.42	1000	21
September	11	E	09/26/05	Bluegill	5	11.67	1000	5
September	11	E	09/26/05	Golden Shiner	2	11.67	1000	2
September	11	E	09/26/05	Largemouth Bass	3	11.67	1000	3
September	11	E	09/26/05	Smallmouth Bass	1	11.67	1000	1
September	11	E	09/26/05	Spottail Shiner	7	11.67	1000	7
September	12	W	09/26/05	American Eel	1	12.58	1000	1
September	12	W	09/26/05	Bluegill	1	12.58	1000	1
September	12	W	09/26/05	Largemouth Bass	8	12.58	1000	8
September	12	W	09/26/05	Pumpkinseed	1	12.58	1000	1
September	12	W	09/26/05	Redbreast Sunfish	10	12.58	1000	10
September	12	W	09/26/05	Rock Bass	1	12.58	1000	1
September	12	W	09/26/05	Smallmouth Bass	3	12.58	1000	3
September	12	W	09/26/05	Yellow Perch	1	12.58	1000	1
September	12	E	09/26/05	Bluegill	4	10.27	1000	4
September	12	E	09/26/05	Fallfish	14	10.27	1000	14
September	12	E	09/26/05	Largemouth Bass	19	10.27	1000	19
September	12	E	09/26/05	Redbreast Sunfish	1	10.27	1000	1
September	12	E	09/26/05	Smallmouth Bass	1	10.27	1000	1
September	12	E	09/26/05	Spottail Shiner	8	10.27	1000	8
September	12	E	09/26/05	Yellow Perch	6	10.27	1000	6
September	13	W	09/27/05	Largemouth Bass	1	10.37	1000	1

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
September	13	W	09/27/05	Redbreast Sunfish	1	10.37	1000	1
September	13	W	09/27/05	Smallmouth Bass	5	10.37	1000	5
September	13	E	09/27/05	Bluegill	3	11.37	1000	3
September	13	E	09/27/05	Largemouth Bass	1	11.37	1000	1
September	13	E	09/27/05	Pumpkinseed	2	11.37	1000	2
September	13	E	09/27/05	Redbreast Sunfish	1	11.37	1000	1
September	13	E	09/27/05	Yellow Perch	2	11.37	1000	2
September	14	W	09/27/05	American Eel	1	9.62	1000	1
September	14	W	09/27/05	Bluegill	27	9.62	1000	27
September	14	W	09/27/05	Largemouth Bass	9	9.62	1000	9
September	14	W	09/27/05	Pumpkinseed	1	9.62	1000	1
September	14	W	09/27/05	Redbreast Sunfish	2	9.62	1000	2
September	14	W	09/27/05	Smallmouth Bass	3	9.62	1000	3
September	14	W	09/27/05	Yellow Perch	1	9.62	1000	1
September	14	E	09/27/05	Bluegill	6	12.15	1000	6
September	14	E	09/27/05	Fallfish	1	12.15	1000	1
September	14	E	09/27/05	Largemouth Bass	5	12.15	1000	5
September	14	E	09/27/05	Pumpkinseed	1	12.15	1000	1
September	14	E	09/27/05	Smallmouth Bass	3	12.15	1000	3
September	14	E	09/27/05	Yellow Perch	1	12.15	1000	1
September	15	W	09/27/05	Bluegill	1	10.98	1000	1
September	15	W	09/27/05	Largemouth Bass	7	10.98	1000	7
September	15	W	09/27/05	Redbreast Sunfish	2	10.98	1000	2
September	15	W	09/27/05	Smallmouth Bass	2	10.98	1000	2
September	15	E	09/27/05	Bluegill	6	11.17	1000	6
September	15	E	09/27/05	Chain Pickerel	1	11.17	1000	1
September	15	E	09/27/05	Golden Shiner	4	11.17	1000	4
September	15	E	09/27/05	Largemouth Bass	6	11.17	1000	6
September	15	E	09/27/05	Pumpkinseed	1	11.17	1000	1
September	15	E	09/27/05	Redbreast Sunfish	2	11.17	1000	2
September	15	E	09/27/05	Smallmouth Bass	2	11.17	1000	2
September	16		09/27/05	Largemouth Bass	1	4.13	500	2
September	17		09/27/05	Smallmouth Bass	1	4.22	500	2

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
September	18		09/26/05	Bluegill	6	5.62	500	12
September	18		09/26/05	Largemouth Bass	5	5.62	500	10
September	18		09/26/05	Pumpkinseed	3	5.62	500	6
September	18		09/26/05	Rock Bass	1	5.62	500	2
September	18		09/26/05	Smallmouth Bass	2	5.62	500	4
November	11	W	11/21/05	No Fish Caught	0	7.18		0
November	11	E	11/21/05	No Fish Caught	0	9.35		0
November	12	W	11/21/05	No Fish Caught	0	10.78		0
November	12	E	11/21/05	No Fish Caught	0	9.75		0
November	13	W	11/21/05	No Fish Caught	0	8.90		0
November	13	E	11/21/05	No Fish Caught	0	8.92		0
November	14	W	11/21/05	Fallfish	114	8.43	1000	114
November	14	W	11/21/05	Spottail Shiner	17	8.43	1000	17
November	14	W	11/21/05	White Perch	1	8.43	1000	1
November	14	E	11/21/05	No Fish Caught	0	9.02		0
November	15	W	11/21/05	No Fish Caught	0	9.22		0
November	15	E	11/21/05	No Fish Caught	0	9.43		0
November	16		11/29/05	Largemouth Bass	2	5.33	500	4
November	16		11/29/05	Smallmouth Bass	1	5.33	500	2
November	17		11/29/05	Largemouth Bass	1	5.38	500	2
November	17		11/29/05	Smallmouth Bass	2	5.38	500	4
November	18		11/29/05	Black Crappie	1	7.02	500	2
November	18		11/29/05	Bluegill	9	7.02	500	18
November	18		11/29/05	Chain Pickerel	3	7.02	500	6
November	18		11/29/05	Golden Shiner	2	7.02	500	4
November	18		11/29/05	Largemouth Bass	3	7.02	500	6
November	18		11/29/05	Pumpkinseed	1	7.02	500	2
November	18		11/29/05	White Sucker	1	7.02	500	2
November	18		11/29/05	Yellow Perch	2	7.02	500	4
December	11	W	12/12/05	Spottail Shiner	1	10.67	1000	1
December	11	E	12/12/05	No Fish Caught	0	11.92		0
December	12	W	12/12/05	No Fish Caught	0	13.68		0
December	12	E	12/12/05	No Fish Caught	0	13.00		0

(continued)

Appendix Table A-4. Continued)

Month	Station	Site	Date	Common Name	Count	Duration (min)	Transect (ft)	CPUE (#/1000' transect)
December	13	W	12/13/05	No Fish Caught	0	9.67		0
December	13	E	12/13/05	No Fish Caught	0	10.17		0
December	14	W	12/13/05	Golden Shiner	5	9.38	1000	5
December	14	W	12/13/05	Spottail Shiner	26	9.38	1000	26
December	14	W	12/13/05	Yellow Perch	1	9.38	1000	1
December	14	E	12/13/05	Spottail Shiner	1	10.22	1000	1
December	15	W	12/13/05	No Fish Caught	0	10.28		0
December	15	E	12/13/05	NO SAMPLE		Ice		
December	16		12/12/05	Bluegill	1	4.90	500	2
December	16		12/12/05	Chain Pickerel	1	4.90	500	2
December	16		12/12/05	Largemouth Bass	2	4.90	500	4
December	16		12/12/05	Yellow Perch	1	4.90	500	2
December	17		12/12/05	Atlantic Salmon	1	5.72	500	2
December	18		12/12/05	Bluegill	1	6.80	500	2
December	18		12/12/05	Golden Shiner	1	6.80	500	2
December	18		12/12/05	Largemouth Bass	1	6.80	500	2
December	18		12/12/05	Spottail Shiner	1	6.80	500	2
December	18		12/12/05	White Perch	1	6.80	500	2
December	18		12/12/05	White Sucker	4	6.80	500	8
December	18		12/12/05	Yellow Perch	35	6.80	500	70

APPENDIX B

2004 and 2005 Water Quality

APPENDIX B

2004 and 2005 Water Quality

Appendix Table B-1. Water quality for electrofishing samples during 2004-2005 at Merrimack Station.

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
April	4/30/2004	11	W	1	12.8	10.3	5	12.5	10.3
		11	E	1	12.2	10.9	7	12	10.6
		12	W	1	12.7	10.3	8	12.5	10.2
		12	E	1	13	10.4	5	12.9	10.2
		16		1	25	9	4	24.9	8.8
		17		1	24.6	9.1	5	24.3	9
		18		1	25.4	8.6	4	25.1	8.6
April	5/1/2004	13	W	1	21.4	9	6	14	9.8
		13	E	1	12.7	10	6	12.6	10
		14	W	1	15.1	9.5	5	14.6	9.8
		14	E	1	14.7	9.9	7	13.5	10.1
		15	W	1	14.2	10.1	5	14.1	10.1
		15	E	1	14.2	10	10	14.1	9.9
May	5/27/2004	11	W	1	12.5	10.1	7	12.5	9.9
		11	E	1	12.5	11.1	9	12.5	10.8
		12	W	1	12.8	10.1	9	12.7	10.1
		12	E	1	12.7	10.2	6	12.6	10.1
		13	W	1	14.5	9.7	8	13.5	9.9
		14	W	1	13.4	9.4	11	13.9	9.9
		16		1	22.8	8.6	9	22.8	9
		17		1	23	8.4	8	22.7	8.8
		18		1	23.5	8.1	7.5	19.3	8.3
May	5/28/2004	13	E	1	13.4	9	9	13.4	9.7
		14	E	1	13.5	9	12	13.5	9.7
		15	W	1	14.1	9.6	8	13.9	9.5
		15	E	1	13.6	9.6	10	13.6	9.7
June	6/27/2004	14	E	1	28.3	6.7	6	21.7	8
June	6/28/2004	11	W	1	21.3	8	4	20.9	7.9
		11	E	1	21	7.8	8	20.8	8.5
		12	W	1	21.3	8.2	6	21.2	8.2
		12	E	1	21.5	7.9	4	21.3	8
		16		1	34.2	6.5	5	34.4	6.6
		17		1	31.3	6.1	5	31.4	6.1
		18		1	30	6.3	4	30	6.4
June	6/29/2004	13	W	1	20.8	5.8	5	22.1	7
		13	E	1	29.2	6.2	5	29.1	6
		14	W	1	26.6	6.7	5	24.4	6.8
		15	W	1	25.9	6.8	6	22.5	7.7
		15	E	1	25.5	7.1	4	24.2	7.2

(continued)

Appendix Table B-1. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
July	7/26/2004	11	W	1	24.1	8.2	4	23.7	8.3
		11	E	1	24	8.3	4	23.7	8.2
		12	W	1	24.1	8.8	6	24	9
		12	E	1	24.5	7.8	3	24.1	8
		16		1	38.1	6.8	3	38.2	7.2
		17		1	34	6.6	4	33.9	6.5
		18		1	33.5	6.9	4	33.4	6.9
July	7/27/2004	13	W	1	26.8	6.4	3	23.8	6.8
		13	E	1	30.5	6.3	3	25.9	6.9
		14	W	1	25.7	6.5	4	24.3	6.7
		14	E	1	27.5	6.4	5	24	6.9
		15	W	1	26	6.5	4	25.3	6.6
		15	E	1	25.2	6.7	4	25.1	6.8
August	8/30/2004	11	W	1	24.3	8.7	4	24.3	8.7
		11	E	1	24.3	8.3	3	24.3	8.7
		12	W	1	24.6	8.8	7	24.4	8.7
		12	E	1	24.5	8.6	2	24.4	9.2
		13	W	1	30.1	7.6	5	25.9	8.6
		13	E	1	31.6	7	7	28.7	7.8
		14	W	1	30.7	7.1	9	24.9	7.7
		14	E	1	25.8	8.1	9	24.7	8.2
August	8/31/2004	15	W	1	26	7.1	5	25	7.2
		15	E	1	27.3	7.2	7	24.7	7.6
		16		1	37.8	7.1	5	37.8	7.4
		17		1	34.5	6.6	5	34.9	6.5
		18		1	33.4	6.6	6	33.5	6.9
September	9/27/2004	11	W	1	18.2	8.3	5	18.3	8.3
		11	E	1	18.1	8.4	5	18.1	8.2
		12	W	1	18.1	7.9	7	18.3	7.7
		12	E	1	18.3	7.7	6	17.9	7.9
		13	W	1	19.1	8.4	4	18.2	8.3
		17		1	29.5	6.1	5	29.4	6.2
		18		1	20.1	7.3	4	19.9	7.3
September	9/29/2004	13	E	1	23.8	7.2	5	19.1	7.8
		14	W	1	18.7	7.9	5	17.8	8
		14	E	1	20.1	7.7	6	18	7.8
		15	W	1	18.5	8	5	18.5	7.8
		15	E	1	18	8.3	5	18	8.2

(continued)

Appendix Table B-1. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (°C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (°C)	Bottom Dissolved Oxygen (ppm)
October	10/18/2004	11	W	1	12.5	10.8	7	12.5	10.8
		11	E	1	12.5	9.8	7	12.5	9.8
		12	W	1	12.6	9.6	8	12.5	9.4
		12	E	1	12.8	8.9	6	12.7	9
		17		1	24.7	6.8	7	24.9	6.8
		18		1	21.4	6.6	6	20.9	6.3
October	10/22/2004	13	W	1	19.5	7.7	4	14.4	7.9
		13	E	1	17.2	7.5	4	10.6	8.7
		14	W	1	15.5	7.7	5	12	8.3
		14	E	1	17.2	7.6	6	12.2	8.3
		15	W	1	12.5	7.9	5	12.2	8.1
		15	E	1	11	8.4	4	11	8.5
December	12/16/2004	11	W	1	0.2	13.6	7	0.2	13.5
		11	E	1	0.4	14.2	8	0.3	13.7
		12	W	1	0.1	13	8	0.2	13.6
		12	E	1	0.3	13.3	9	0.3	13.4
		16		1	22	8.6	7	22	8.6
		17		1	12.9	10.4	7	13	10.6
		18		1	10.2	9.8	5	10.5	10.2
December	12/17/2004	13	W	1	5.4	12.1	6	4	12.4
		14	W	1	5.4	11.4	6	5.3	11.2
		15	W	1	2.9	12.3	9	2.8	12.3
		13	E	Ice	Ice	Ice	Ice	Ice	Ice
		14	E	Ice	Ice	Ice	Ice	Ice	Ice
		15	E	Ice	Ice	Ice	Ice	Ice	Ice
April	4/19/2005	11	W	1	9.7	10.9	4	9.6	10.8
		11	E	1	10.1	10.7	8	9.8	10.9
		12	W	1	10.1	11	5	10	10.8
		12	E	1	10	10.7	4	9.9	10.9
		13	W	1	16.1	10	6	11.5	11
		16		1	24	9	5	23.7	4.3
		17		1	23.1	9	5	23	8.9
		18		1	23.1	8.6	6	17.2	8.2
April	4/20/2005	13	E	1	11.3	10.5	4	10.9	9.6
		14	W	1	13.7	10	5	12.7	10.3
		14	E	1	11.3	10.7	7	11.2	10.6
		15	W	1	13.4	10.5	5	13	10.1
		15	E	1	12.4	9.6	3	12.5	9.4

(continued)

Appendix Table B-1. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
May	5/18/2005	11	W	1	13.1	10.4	5	13.1	10.2
		11	E	1	13.2	9.9	7	13	9.7
		12	W	1	13	10.1	6	13	10.2
		12	E	1	13.4	9.9	4	13.2	10.1
		16		1	26.9	7	4	27	6.8
		17		1	25.2	7.1	3	25.6	7.2
May	5/19/2005	13	W	1	14.2	9.4	4	13.1	9.8
		13	E	1	12.6	9.7	4	12.4	8.8
		14	W	1	13.9	9.5	5	13.3	9.5
		14	E	1	12.6	10	7	12.5	9.6
		15	W	1	13.6	9.1	5	13.5	9.4
		15	E	1	13.3	10	6	13.1	9.7
		18		1	21.1	8	4	16.6	8.1
June	6/29/2005	11	W	1	23.9	8.4	7	23.8	8.8
		11	E	1	23.8	9.2	7	23.7	8.2
		12	W	1	23	7.4	8	22.9	7.3
June	6/30/2005	12	E	1	22.6	7.9	4	22.5	7.7
		13	W	1	26.7	6.8	4	24.1	7.2
		13	E	1	23.3	7.5	4	23.1	7.5
		14	W	1	27.7	7.1	5	23.6	7.1
		14	E	1	23.2	7.6	6	23.1	7.6
		15	W	1	23.2	7.6	6	23.1	7.6
		15	E	1	23.2		5	23.1	
		16		1	36.2	6.4	5	36.3	6.1
		17		1	33.7	5.9	4	33.7	5.6
		18		1	31.9	7.8	5	26.7	4.1
July	7/25/2005	11	W	1	24.9	8	4	24.7	8.5
		11	E	1	24.9	8.2	5	24.8	8
		12	W	1	24.6	8.1	6	24.6	7.9
		13	W	1	33.7	6.6	2	30.3	7.6
		13	E	1	31.3	7.2	5	30.9	7.2
		14	W	1	29.5	7.4	3	24.9	8
		14	E	1	28.8	7.4	6	25.3	7.9
		15	E	1	28.8	6.8	4	26.7	6.5
July	7/26/2005	12	E	1	25.1	7.7	3	24.9	8
		15	W	1	30.6	7.1	4	26.6	7
		16		1	38.1	6.3	3	38.2	6.4
		17		1	34.3	6.1	3	34.4	6.2
		18		1	33.5	8	3	33.1	6.6

(continued)

Appendix Table B-1. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
August	8/22/2005	11	W	1	24.5	7.2	4	23.9	7.7
		11	E	1	24.6	7.8	5	24.1	8
		12	W	1	24.4	7.6	6	24	7.8
		12	E	1	23.9	7.6	3	23.9	7.7
		13	W	1	30.5	6.4	4	24.5	7.5
		13	E	1	32.3	6.5	4	24	7.2
		14	W	1	29.8	6.6	4	28.8	6.6
		14	E	1	29.5	5.9	5	23.9	7.1
		15	W	1	27.4	5.3	4	24.4	6.2
		15	E	1	27	6.5	4	24.2	6.6
		16		1	36.6	6.4	3	36.8	6.9
		17		1	33.8	6.4	4	34	6.6
		18		1	32.6	5.4	4	32.8	5.9
September	9/26/2005	11	W	1	18.5	8.7	7	18.5	8.8
		11	E	1	18.5	8.9	7	18.5	9
		12	W	1	18.7	8.4	8	18.6	8.5
		12	E	1	19.1	8.8	8	18.7	8.6
		18		1	29.1	6.5	5	29.1	6.1
September	9/27/2005	13	W	1	23.7	8.1	3	20.2	9.2
		13	E	1	27.5	7.6	5	19.4	9.2
		14	W	1	21.8	8.4	4	20	8.4
		14	E	1	23.9	7.8	5	24.2	7.6
		15	W	1	22.7	7.3	4	22.8	7.3
		15	E	1	22	7.5	5	21.8	7.7
		16		1	31.6	7.6	4	31.6	7.6
		17		1	28.8	7.2	4	28.8	7
November	11/21/2005	11	W	1	5.3	11.4	5	5.2	11.5
		11	E	1	5.3	11.6	9	5.3	11.5
		12	W	1	5.4	11.6	8	5.3	11.6
		12	E	1	5.3	11.6	6	5.3	11.6
		13	W	1	8.5	9.9	6	8	10.5
		13	E	1	5.2	11.2	4	5.2	11.4
		14	W	1	5	11.4	4	5	11.4
		14	E	1	5.1	11.5	7	5.1	11.5
		15	W	1	5.6	11.4	7	5.5	11.5
		15	E	1	5	11.5	5	5	11.7
November	11/29/2005	16		1	16.6	11.9	3	16.7	11.6
		17		1	16.1	11.3	4	16.3	11
		18		1	14.3	11.3	3	14	10.7

(continued)

Appendix Table B-1. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
December	12/12/2005	11	W	1	1.7	12.5	4	1.5	12.3
		11	E	1	1.5	11.9	4	1.5	12.8
		12	W	1	1.7	12.2	5	1.6	12.8
		12	E	1	1.5	12.6	4	1.5	12.3
		16		1	15.6	9.5	3	15.9	10.1
		17		1	15.4	9.6	3	15.5	9.9
		18		1	14.3	8.9	4	9.9	9.3
December	12/13/2005	13	W	1	10.1	7.8	3	5.3	8.2
		13	E	1	0.9	8.7	7	1	9
		14	W	1	6.3	7.5	3	5	7.9
		14	E	1	0.9	9.4	7	1	9.2
		15	W	1	2.5	8.7	7	2.5	8.7

Appendix Table B-2. Water quality for trap net samples during 2004-2005 at Merrimack Station.

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
April	4/19/2004	1	W	1	11.2	10.2	6	11.2	10.1
		1	E	1	11.3	10.4	7	11.2	10.2
		2	W	1	12.6	10	5	12.8	9.8
		3	E	1	11.4	10.6	10	11.3	10.3
		4		1	17.8	9.1	4	17.7	9.1
		5		1	17.1	9.1	6	16.9	9.1
April	4/21/2004	1	W	1	11.7	9.9	4.5	11.7	9.7
		1	E	1	11.7	9.9	6	11.7	9.7
		2	W	1	13.4	9.6	4	13.1	9.4
		3	E	1	11.7	9.8	9	11.7	9.7
		4		1	17	9	4	17	8.9
		5		1	17.2	9.1	5	17.2	8.9
May	5/17/2004	1	W	1	18.7	10	5	18.7	10.2
		1	E	1	18.5	10.8	8	18.5	11.1
		2	W	1	19.5	9.5	5	19.2	10.2
		3	E	1	19.4	11	10	19.2	10.7
		4		1	32.1	7.5	5	31.9	7.8
		5		1	29.1	7.8	6	24.3	8
May	5/19/2004	1	W	1	18.6	8.9	5	18.5	8.7
		1	E	1	18.5	8.6	8	18.5	8.8
		2	W	1	19.8	8.8	6	19.7	8.5
		3	E	1	19.8	8.4	10	19.6	8.7
		4		1	26.6	6.9	7	25.9	7
		5		1	31.5	6.6	9	31.2	6.9
June	6/21/2004	1	W	1	20.9	7.6	3	20.7	7.9
		1	E	1	21	8.5	7	20.9	8.2
		2	W	1	22.2	8	4	21.8	8.1
		3	E	1	25.4	7.5	7	21.7	8.3
		4		1	34.6	6.7	4	34.6	7.1
		5		1	31.8	6.2	4	31.7	6.3
June	6/23/2004	1	W	1	21.9	8	2	21.9	7.9
		1	E	1	22	8.4	6	21.9	8.2
		2	W	1	28.9	6.5	2	28.2	7
		3	E	1	28.4	6.9	7	22.7	8.5
		4		1	35.5	6.9	4	35.5	6.9
		5		1	32.5	6	4	32.5	5.5

(continued)

Appendix Table B-2. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
July	7/19/2004	1	W	1	23.8	6.2	6	22.9	6.4
		1	E	1	23.3	7.1	8	23.2	7.1
		2	W	1	27.1	6.1	4	23.5	6.4
		3	E	1	29.6	5.5	8	23.7	5.9
		4		1	36.9	5.1	3	36.9	5.6
		5		1	33.7	5.5	6	33.6	5.4
July	7/21/2004	1	W	1	25.1	7.7	3	24.7	7.7
		1	E	1	24.9	7.2	8	24.8	7.3
		2	W	1	31.3	6.6	3	30.7	6.1
		3	E	1	30.4	6.7	8	25.5	7.2
		4		1	38.6	6.6	3	38.5	6.7
		5		1	35.3	6.3	5	35.3	6.3
August	8/23/2004	1	W	1	23.2	7.3	8	21.3	7.4
		1	E	1	25.7	7.3	5	21.6	7.6
		2	W	1	22.1	8.3	9	22	8
		3	E	1	21.9	8	5	21.7	7.9
		4		1	35.2	6.7	3	35.3	6.7
		5		1	31.7	6.8	5	31.6	6.8
August	8/25/2004	1	W	1	22.1	7.3	4	21.8	7.2
		1	E	1	22.2	7.4	9	22	7.8
		2	W	1	28.2	7	5	22.9	7.6
		3	E	1	28.1	7	9	22.9	7.7
		4		1	35.8	6.3	5	35.7	6.2
		5		1	32.7	6.3	5	32.7	6.2
September	9/20/2004	1	W	1	17.7	8.7	4	17.4	8.6
		1	E	1	17.5	8.6	9	17.2	8.8
		2	W	1	21.2	7.4	5	17.5	8.3
		3	E	1	18.6	8.1	10	17.8	8.5
		5		1	28.6	6.3	6	28.9	6.6
September	9/22/2004	1	W	1	18.4	8.5	4	18.4	8.3
		1	E	1	18.3	8	9	18.3	8.3
		2	W	1	19.8	7.5	5	18.6	7.9
		3	E	1	20.5	7.5	9	18.5	8.2
		5		1	29.4	6.1	4	29.5	6.4
October	10/11/2004	1	W	1	13.4	10.7	5	13.1	9.9
		1	E	1	13.3	9.9	8	13.2	9.9
		2	W	1	17.1	9.1	5	16.2	8.6
		3	E	1	20.1	8.7	7	13.6	9.7
		5		1	25.5	8.1	6	25.5	8.1

(continued)

Appendix Table B-2. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
October	10/13/2004	1	W	1	13.4	9.5	6	13.3	9.3
		1	E	1	13.5	9.3	7	13.4	8.4
		2	W	1	18.9	8.8	4	13.9	9
		3	E	1	18.6	8	7	14.1	9.2
		5		1	25.7	7.5	5	25.7	7
December	12/6/2004	1	W	1	6.2	10	7	5.2	10.5
		1	E	1	1.7	15.1	12	1.5	14.6
		2	W	1	1.5	11.3	8	1.4	11.3
		3	E	1	1.5	11	10	1.4	11.2
		4		1	14.6	8.9	5	14.6	8.7
		5		1	14.5	8.8	6	14.6	8.8
December	12/8/2004	1	W	1	4.5	11.8	7	4	12.3
		1	E	1	2.3	13.4	12	2.2	13.1
		2	W	1	2.1	13	8	2.1	12.8
		3	E	1	2.2	12.8	10	2.1	12.9
		4		1	14.6	8.9	5	14.6	9.3
		5		1	12.9	9.2	6	12.9	9.5
April	4/25/2005	4		1	22.8	8.9	9	22.9	9.2
		5		1	21.9	8.7	9	22.4	9
May	5/23/2005	1	W	1	11	10.4	5	11	10.5
		1	E	1	10.8	10.6	8	10.8	11
		2	W	1	12	10.9	7	11.6	11.2
		3	E	1	10.8	10.7	11	10.9	10.9
		4		1	20.7	8	6	19.7	7.9
		5		1	21.6	7.6	8	21.7	7.3
May	5/25/2005	1	W	1	10.1	10.5	5	10.1	11.2
		1	E	1	10.1	11.7	7	10.1	11.5
		2	W	1	12	11.2	7	11.3	11.3
		3	E	1	10.2	11.7	10	10.2	12.1
		4		1	20.9	8.4	6	21	8.5
		5		1	20.6	8.2	7	20.6	8.8
June	6/20/2005	1	W	1	18.8	7.7	5	18.8	7.8
		1	E	1	18.9	8	6	18.9	8
		2	W	1	19.5	7.8	10	19.4	7.6
		3	E	1	21.2	7.3	5	20.5	7.6
		4		1	31.4	6	7	31.4	6.3
		5		1	29.8	5.8	7	29.9	5.8

(continued)

Appendix Table B-2. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
June	6/22/2005	1	W						
		1	E						
		2	W						
		3	E						
		4							
		5							
July	7/18/2005	1	W	1	26.8	7.6	7	26.5	8.2
		1	E	1	26.3	8.1	7	26.3	7.9
		2	W	1	27	7.1	8	26.5	7.6
		3	E	1	27.6	7.1	8	26.3	7.6
		4		1	39.4	6.3	4	39.2	6.7
		5		1	36	6.1	5	35.9	6.1
July	7/20/2005	1	W	1	26.5	7.2	7	26.3	8
		1	E	1	26.5	7.6	7	26.5	7.5
		3	E	1	28.2	7.4	7	26.3	7
		4		1	38.8	6	4	39	6.6
		5		1	35.5	5.8	5	35.6	6
July	7/25/2005	3	E	1	32.7	6.8	9	26.5	7.9
July	7/26/2005	2	W	1	29.8	6.8	3	26.5	7.2
August	8/15/2005	1	W	1	24.8	7.5	5	24.6	7.6
		1	E	1	24.6	7.5	7	24.6	7.6
		2	W	1	30	7.1	6	26.1	7.8
		3	E	1	31.1	6.9	10	25.1	7.8
		4		1	37	6.6	5	36.9	6.5
		5		1	33.9	6.4	5	33.9	6.2
August	8/17/2005	1	W	1	24.4	7.8	5	24.1	7.8
		1	E	1	24.5	8.1	10	24	8
		2	W	0.1	28.2	6.9	0.3	28.4	6.5
		3	E	1	28.1	6.6	8	24.4	7.1
		4		1	35.7	6.7	5	36	6.1
		5		1	32.2	6.7	5	32.6	6.6
September	9/12/2005	1	W	1	22.7	8.4	4	22.1	8.5
		1	E	1	22.4	8.1	9	22.1	8.2
		2	W	1	30.5	6.3	4	23.4	8.2
		3	E	1	29.9	7	8	22.4	8.6
		4		1	35.7	6.9	2	35.7	6.5
		5		1	32.8	6.5	5	32.8	6.1

(continued)

Appendix Table B-2. Continued)

Month	Date	Station	Site	Surface Depth (ft)	Surface Temperature (° C)	Surface Dissolved Oxygen (ppm)	Bottom Depth (ft)	Bottom Temperature (° C)	Bottom Dissolved Oxygen (ppm)
September	9/14/2005	1	W	1	22.5	7.6	4	22.5	7.3
		1	E	1	22.5	7.6	9	22.6	7.5
		2	W	1	28.4	6.5	3	28.4	6.3
		3	E	1	28.2	6.7	10	22.8	7.7
		4		1	35.5	6.5	5	35.5	6.1
		5		1	32.5	6.1	5	32.7	6.4

APPENDIX C

Temperature Response Data for Merrimack Station RIS

Appendix Table C. Temperature Response Data for Merrimack Station RIS.

Temperatures at which thermal effects have been reported for Alewife.

Species: Alewife

Parameter	Temperature (F) Critical	Acclimation	Comments	References	Temperature Selection Rationale
Max. for summer survival, or UILT	88-93	81	Adult	McCauley and Binkowski (1982)	90: Acceptable value based on reported ranges
	80-90		Young of year	Otto et al. (1976)	
	88	57-59	Yolk sac larvae	Kellog (1982)	
Optimum for growth	80		Maximum net biomass gain for YOY	Kellog (1982)	80: Single value available
Avoidance	72		Adult spring avoidance for spawning streams	Becker (1983)	84: Based on preferred summer Temps of adult and YOY fish -provides conservative estimate
	46		Adult spring avoidance for spawning streams	Becker (1983)	
Preferred	80		Adult- summer	Spotila et al. (1979)	84: Midpoint of adult and YOY ranges
	88		Young of year – summer	Spotila et al. (1979)	
	79		Preferred larval temperature	Kellog (1982)	
Spawning	48-54		Spawning migration – coastal NH	Scarola (1987)	60: Approx. midpoint of range
	59-68		Ripe adults present – Neuse River, NC	Bozeman and VanDenAvyle (1989)	
	51-71		Reported spawning range	Smith (1985)	
	80.6		Cease spawning	Bozeman and VanDenAvyle (1989)	
Early Life History	45-84		Range –egg incubation and development	Pardue (1983)	60: Conservative midpoint of Peak hatch and larval survival range
	64		Peak hatching temperature	Edsall (1970)	
	58-59		Peak survival of unfed larvae	Edsall (1970)	

Temperatures at which thermal effects have been reported for American Shad.

American shad

Parameter	Temperature (F) Critical	Acclimation	Comments	References	Temperature Selection Rationale
Max. for summer survival, or UILT	90.5	75.2-82.4	Young experience rapid mortality.	Moss (1970)	90: single value available
Optimum for growth	50-88		Juv's found over this range in Conn. R. Apparent wide temp tolerance in rivers	Marcy et al. (1972) Stier and Crance (1985)	70: approximate mid-point of range
Avoidance	86		Avoided thermal plume, Conn. R.	Marcy (1976b)	86: single value available is reasonable considering max. for summer survival and temperatures at which juveniles were found by Marcy et al. (1972)
	46		Juveniles generally avoid temps. less than this. Juveniles begin emigrating from river when temps. drop below 60°F.	Marcy (1976b) Crance (1985)	
	50		Juveniles absent below this temp., had outmigrated from Conn. R.	Marcy (1976b)	
Preferred	60-70		Spend majority of time at these temps.	Leggett and Whitney (1972)	65: mid-point of range
Spawning	near 65		Peak movement of spawning run into rivers.	Leggett and Whitney (1972)	65: spawning, lower mid-range
	60-75		Approx. range- during passage by Vermont Yankee, fishway daily mean temps., 1998-2002.	Vernon Dam fishway data	
	46-79		Range- during spawning	Scott and Crossman (1973)	
	57-70		Peak spawning activity	Stier and Crance (1985)	
Early life history	50-86		Range- egg incubation, development	Scott and Crossman (1973)	70: egg, larval development
	60-80		Optimum for egg, larval development; Conn. R.	Marcy (1976b)	

Temperatures at which thermal effects have been reported for Atlantic Salmon.

Species: Atlantic salmon

Parameter	Temperature (F) Critical	Temperature (F) Acclimation	Comments	References	Temperature Selection Rationale
Max. for summer survival, or UILT	82	81.5	Juveniles (parr) No mortality below this temp.	Stanley and Trial (1995)	82: single value. Note that optimum parr habitat is not found in lower Hooksett Pool
Optimum for growth	59-66 72.5		Juveniles (parr) Maximum limit for feeding, parr	Stanley and Trial (1995)	Not Applicable: Preferred parr habitat not present.
Avoidance	N/A		No appropriate data found		78: It is assumed that the fish will avoid near-lethal temperatures.
Preferred	58		Juveniles (parr)	Stanley and Trial (1995)	Not Applicable: Preferred habitat not present.
Spawning	60-74		Approx. range- upriver passage at Vernon. fishway daily mean temps.. 1998-2002.	Vernon Dam fishway data	Not Applicable: Do not spawn in Merrimack. R. near Merrimack Station
	<73		Adults generally found to migrate to spawning grounds at or below temp.	Stanley and Trial (1995)	

Temperatures at which thermal effects have been reported for Smallmouth Bass.

Species: Smallmouth bass

Parameter	Temperature (F) Critical	Temperature (F) Acclimation	Comments	References	Temperature Selection Rationale
Max. for summer survival, or UILT	98.6	95	UILT, young and adults	Armour (1993a)	98: suggested UILT
Optimum for growth	89.6-91.4		MWAT for adequate juvenile and adult growth.	Armour (1993a)	90: mid-range
Avoidance	95-100	70-90	Juveniles	Peterson and Schutsky (1977)	95: Minimum of range
Preferred	73-82	80-82	Juveniles	Peterson and Schutsky (1977)	81: conservative temperature
	80.6		Adults	Armour (1993a)	
	86-87.8	75.2-86	Juveniles	Cherry et al. (1975)	
Spawning	59-70		Spawning, daily mean	Armour (1993a)	63: spawning.lower mid-range; incubation
	61-65		Most egg deposition	Scott and Crossman (1973)	
Early life history	59-77		Favorable hatching success	Armour (1993a)	70: hatching, early development

Temperatures at which thermal effects have been reported for Largemouth Bass.

Species: Largemouth Bass

Parameter	Temperature (F) Critical	Acclimation	Comments	References	Temperature Selection Rationale
Max. for summer survival, or UILT	95-98	85	95F sublethal 98F lethal to 50% in <3 hours	Peterson and Schutsky (1977)	95: minimum of range
Optimum for growth	75-86 81-86		Adults, very little growth, <59 >97 Optimal for fry	Stuber et al. (1982)	83: slightly below maximum, lower than preferred
Avoidance	87-91 90-99 96	77 80-84	 Juveniles MWAT tolerance	Meldrim and Gift (1971) Peterson and Schutsky (1977) Eaton and Scheller (1996)	90: conservatively low
Preferred	86-89 81	79-82	Juveniles Final preferred temp. determined by sonic tagging	Peterson and Schutsky (1977) Coutant (1974)	86: minimum of range in lab tests
Spawning	68-70		Optimal	Stuber et al. (1982)	70: spawning
Early life history	55-79		Acceptable range Survival very low, <50 >86		75: incubation, early development

Temperatures at which thermal effects have been reported for Pumpkinseed.

Species: Pumpkinseed

	Temperature (F)				
Parameter	**Critical**	**Acclimation**	**Comments**	**References**	**Temperature Selection Rationale**
Max. for summer survival, or UILT	94	77		Spotilat et al. (1979)	94: Single value
Optimum for growth	86		Fall captured, wild fish	Jobling (1981)	86: Single value
Avoidance	88		Adult fish, lab setting	Coutant (1977)	88: Single value
Preferred	83-90 89		Adult fish Juvenile fish	Coutant (1977) Coutnat (1977)	86: Approx. midpoint of adult and juvenile temps.
Spawning	55-63 67		Adult nest building Spawning activity	Becker (1983) Becker (1983)	67: Single value for spawning activity
Early life history	66-76.5		Hatching in 47 hours	Becker (1983)	71: Approx. midpoint of peak hatching temps.

Temperatures at which thermal effects have been reported for Yellow Perch.

Species: Yellow perch

Parameter	Temperature (F) Critical	Acclimation	Comments	References	Temperature Selection Rationale
Max. for summer survival, or UILT	84-95		UILT- juveniles	Krieger et al. (1983)	90: UILT typically higher than upper avoidance and MWAT tolerance reported by Eaton and Scheller (1996)
	90		UILT- adults	Krieger et al. (1983)	
	84	77	UILT- adults, juveniles.	Wismer and Christie (1987)	
	85	72-75	UILT- larvae	Wismer and Christie (1987)	
Optimum for growth	72		MWAT	Wismer and Christie (1987)	74: within optimum range
	73-76		Optimum	Krieger et al. (1983)	
	50		Near the upper limit of low temp. period needed for maturation of eggs.	Krieger et al. (1983)	
Avoidance	79-84			Krieger et al. (1983)	83: upper mid-range
	84		MWAT tolerance	Eaton and Scheller (1996)	
	84-88	75-77	Upper avoidance	Wismer and Christie (1987)	
Preferred	64-77		Range- young, adults	Krieger et al. (1983)	77: approximate mid-range
	77-81		Range- young of year	Wismer and Christie (1987)	
Spawning	45-59		Range- spawning	Wismer and Christie (1987)	50: lower mid-range spawning
Early life history	45-68		Range- good incubation, hatching	Krieger et al. (1983)	65: incubation, hatching
	46-70		Ichthyoplankton collected over this range		

Temperatures at which thermal effects have been reported for Fallfish.

Species: Fallfish

Parameter	Temperature (F) Critical	Acclimation	Comments	References	Temperature Selection Rationale
Max. for summer survival, or UILT	90		UILT	Trial et al. (1983)	90: single value
Optimum for growth	50-68		Apparent highest suitability; avg. temp. during warmest time of year	Trial et al. (1983)	68: reasonable to select maximum to evaluate warmest period of year
Avoidance	82		Seldom occur in waters with average above this temp.	Trial et al. (1983)	82: consensus temperature
	82		Upper avoidance	Scott and Crossman (1973)	
Preferred	Not Available				
Spawning	54		Nest building	Wismer and Christie (1987)	
	59-64		Spawning, usual range	Trial et al. (1983)	60: spawning
Early life history	61-64		Embryo incubation usually occurs		65: hatching, early development

Temperatures at which thermal effects have been reported for White Sucker.

Species: White sucker

Parameter	Temperature (F) Critical	Temperature (F) Acclimation	Comments	References	Temperature Selection Rationale
Max. for summer survival, or UILT	88	79	Adults, juveniles	Twomey et al. (1984)	88: at high acclimation temperature
Optimum for growth	75		Summer. Optimum temps may vary geographically; broad temp. tolerances.	Twomey et al. (1984)	81: within range, approximates preferred temperature
	54-84		Range	Wismer and Christie (1987)	
Avoidance	81		Larvae	Twomey et al. (1984)	86: approximate mid-range
	81		MWAT tolerance	Eaton and Scheller (1996)	
	90	75	Juveniles, lab tests	Peterson and Schutsky (1977)	
Preferred	73-77		Larvae	Twomey et al. (1984)	81: reasonable based on acclimation temperature
	81	77	Juveniles, lab tests	Peterson and Schutsky (1977)	
Spawning & early life history	50-68		Usual spawning range	Trautman (1957)	60: approximate mid-range, spawning, hatching 65: early development
	59		Max. hatching success; diminished <48 >63	Twomey et al. (1984)	
	57-71		Ichthyoplankton collected over this range		

APPENDIX D

Length and Weight of All Species Captured by Electrofishing and 3/4-in. Mesh Trapnet within Hooksett Pool during the 2004 and 2005 Fisheries Surveys

Appendix Table D. **Length and weight of all species captured by electrofishing and 3/4-in. mesh trapnet within Hooksett Pool during the 2004 and 2005 fisheries surveys.**

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	1	W	3/4-in. Mesh Trapnet	American Eel	500	
2004	April	5		3/4-in. Mesh Trapnet	Bluegill	181	100
2004	April	4		3/4-in. Mesh Trapnet	Bluegill	222	170
2004	April	1	W	3/4-in. Mesh Trapnet	Bluegill	83	4
2004	April	2	W	3/4-in. Mesh Trapnet	Bluegill	228	265
2004	April	5		3/4-in. Mesh Trapnet	Bluegill	235	285
2004	April	5		3/4-in. Mesh Trapnet	Bluegill	231	255
2004	April	5		3/4-in. Mesh Trapnet	Bluegill	184	110
2004	April	5		3/4-in. Mesh Trapnet	Bluegill	188	160
2004	April	1	W	3/4-in. Mesh Trapnet	Fallfish	177	45
2004	April	1	W	3/4-in. Mesh Trapnet	Fallfish	120	12
2004	April	1	W	3/4-in. Mesh Trapnet	Golden Shiner	98	4
2004	April	1	W	3/4-in. Mesh Trapnet	Golden Shiner	101	5
2004	April	1	E	3/4-in. Mesh Trapnet	Pumpkinseed	90	11
2004	April	4		3/4-in. Mesh Trapnet	Redbreast Sunfish	206	170
2004	April	1	W	3/4-in. Mesh Trapnet	Rock Bass	241	240
2004	April	5		3/4-in. Mesh Trapnet	Rock Bass	233	240
2004	April	5		3/4-in. Mesh Trapnet	Rock Bass	212	180
2004	April	3	E	3/4-in. Mesh Trapnet	Rock Bass	205	130
2004	April	1	W	3/4-in. Mesh Trapnet	Rock Bass	70	4
2004	April	2	W	3/4-in. Mesh Trapnet	Rock Bass	187	140
2004	April	2	W	3/4-in. Mesh Trapnet	Rock Bass	195	150
2004	April	3	E	3/4-in. Mesh Trapnet	Rock Bass	188	100
2004	April	5		3/4-in. Mesh Trapnet	Rock Bass	200	170
2004	April	5		3/4-in. Mesh Trapnet	Smallmouth Bass	254	150
2004	April	5		3/4-in. Mesh Trapnet	Smallmouth Bass	255	150
2004	April	5		3/4-in. Mesh Trapnet	Smallmouth Bass	326	380
2004	April	5		3/4-in. Mesh Trapnet	Smallmouth Bass	442	900
2004	April	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	76	2
2004	April	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	70	1
2004	April	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	76	2
2004	April	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	66	1
2004	April	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	72	1
2004	April	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	81	2
2004	April	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	73	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	178	44
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	343	440
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	360	440
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	338	400
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	378	580
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	355	420
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	305	310
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	245	110
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	320	330
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	305	240
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	366	450
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	308	260
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	290	250
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	211	90
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	460	800
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	455	800
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	314	230
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	254	150
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	196	95
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	181	40
2004	April	1	W	3/4-in. Mesh Trapnet	White Sucker	126	18
2004	April	1	W	3/4-in. Mesh Trapnet	Yellow Perch	231	120
2004	April	2	W	3/4-in. Mesh Trapnet	Yellow Perch	262	185
2004	April	1	W	3/4-in. Mesh Trapnet	Yellow Perch	276	230
2004	May	2	W	3/4-in. Mesh Trapnet	American Eel	630	700
2004	May	2	W	3/4-in. Mesh Trapnet	American Eel	395	250
2004	May	1	W	3/4-in. Mesh Trapnet	American Eel	505	500
2004	May	1	W	3/4-in. Mesh Trapnet	American Eel	670	650
2004	May	1	W	3/4-in. Mesh Trapnet	American Eel	340	250
2004	May	1	E	3/4-in. Mesh Trapnet	American Eel	580	450
2004	May	2	W	3/4-in. Mesh Trapnet	Black Crappie	290	340
2004	May	2	W	3/4-in. Mesh Trapnet	Black Crappie	282	335
2004	May	4		3/4-in. Mesh Trapnet	Black Crappie	265	300
2004	May	4		3/4-in. Mesh Trapnet	Black Crappie	220	120
2004	May	2	W	3/4-in. Mesh Trapnet	Bluegill	231	300
2004	May	2	W	3/4-in. Mesh Trapnet	Bluegill	222	270
2004	May	4		3/4-in. Mesh Trapnet	Bluegill	208	195
2004	May	4		3/4-in. Mesh Trapnet	Bluegill	195	165

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	May	2	W	3/4-in. Mesh Trapnet	Bluegill	227	275
2004	May	3	E	3/4-in. Mesh Trapnet	Bluegill	244	330
2004	May	5		3/4-in. Mesh Trapnet	Bluegill	186	155
2004	May	5		3/4-in. Mesh Trapnet	Bluegill	179	130
2004	May	5		3/4-in. Mesh Trapnet	Bluegill	246	320
2004	May	4		3/4-in. Mesh Trapnet	Bluegill	214	230
2004	May	1	E	3/4-in. Mesh Trapnet	Brown Bullhead	72	2
2004	May	2	W	3/4-in. Mesh Trapnet	Brown Bullhead	323	450
2004	May	4		3/4-in. Mesh Trapnet	Brown Bullhead	299	420
2004	May	1	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	131	20
2004	May	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	133	30
2004	May	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	202	175
2004	May	1	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	152	55
2004	May	1	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	125	15
2004	May	1	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	184	125
2004	May	2	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	260	195
2004	May	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	89	7
2004	May	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	260	370
2004	May	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	145	45
2004	May	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	134	25
2004	May	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	88	5
2004	May	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	207	205
2004	May	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	203	175
2004	May	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	238	335
2004	May	1	W	3/4-in. Mesh Trapnet	Rock Bass	248	300
2004	May	1	W	3/4-in. Mesh Trapnet	Rock Bass	225	255
2004	May	1	E	3/4-in. Mesh Trapnet	Rock Bass	225	215
2004	May	1	E	3/4-in. Mesh Trapnet	Rock Bass	160	60
2004	May	1	E	3/4-in. Mesh Trapnet	Rock Bass	184	120
2004	May	1	E	3/4-in. Mesh Trapnet	Rock Bass	214	195
2004	May	1	E	3/4-in. Mesh Trapnet	Rock Bass	178	110
2004	May	1	E	3/4-in. Mesh Trapnet	Rock Bass	134	35
2004	May	2	W	3/4-in. Mesh Trapnet	Rock Bass	212	195
2004	May	2	W	3/4-in. Mesh Trapnet	Rock Bass	204	175
2004	May	2	W	3/4-in. Mesh Trapnet	Rock Bass	224	270
2004	May	3	E	3/4-in. Mesh Trapnet	Rock Bass	159	55
2004	May	3	E	3/4-in. Mesh Trapnet	Rock Bass	195	145
2004	May	1	W	3/4-in. Mesh Trapnet	Rock Bass	102	5

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	May	1	W	3/4-in. Mesh Trapnet	Rock Bass	228	285
2004	May	1	W	3/4-in. Mesh Trapnet	Rock Bass	210	190
2004	May	1	W	3/4-in. Mesh Trapnet	Rock Bass	172	65
2004	May	1	W	3/4-in. Mesh Trapnet	Rock Bass	220	200
2004	May	2	W	3/4-in. Mesh Trapnet	Rock Bass	153	55
2004	May	2	W	3/4-in. Mesh Trapnet	Rock Bass	234	305
2004	May	2	W	3/4-in. Mesh Trapnet	Rock Bass	225	265
2004	May	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	249	180
2004	May	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	302	355
2004	May	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	146	15
2004	May	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	123	5
2004	May	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	402	800
2004	May	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	255	200
2004	May	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	302	400
2004	May	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	273	295
2004	May	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	375	550
2004	May	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	375	600
2004	May	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	176	55
2004	May	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	256	195
2004	May	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	169	40
2004	May	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	156	25
2004	May	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	276	230
2004	May	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	293	280
2004	May	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	370	550
2004	May	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	277	310
2004	May	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	265	310
2004	May	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	152	25
2004	May	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	228	165
2004	May	5		3/4-in. Mesh Trapnet	Smallmouth Bass	202	90
2004	May	1	W	3/4-in. Mesh Trapnet	White Sucker	470	1200
2004	May	2	W	3/4-in. Mesh Trapnet	White Sucker	355	450
2004	May	2	W	3/4-in. Mesh Trapnet	White Sucker	466	1000
2004	May	2	W	3/4-in. Mesh Trapnet	White Sucker	416	600
2004	May	2	W	3/4-in. Mesh Trapnet	Yellow Bullhead	230	185
2004	May	1	W	3/4-in. Mesh Trapnet	Yellow Bullhead	110	4
2004	May	1	W	3/4-in. Mesh Trapnet	Yellow Perch	258	225
2004	May	1	W	3/4-in. Mesh Trapnet	Yellow Perch	213	120
2004	May	1	E	3/4-in. Mesh Trapnet	Yellow Perch	197	60

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	May	1	E	3/4-in. Mesh Trapnet	Yellow Perch	253	200
2004	May	1	W	3/4-in. Mesh Trapnet	Yellow Perch	178	45
2004	May	1	W	3/4-in. Mesh Trapnet	Yellow Perch	192	60
2004	May	1	W	3/4-in. Mesh Trapnet	Yellow Perch	264	220
2004	June	2	W	3/4-in. Mesh Trapnet	Black Crappie	290	435
2004	June	2	W	3/4-in. Mesh Trapnet	Black Crappie	281	395
2004	June	2	W	3/4-in. Mesh Trapnet	Black Crappie	197	110
2004	June	5		3/4-in. Mesh Trapnet	Black Crappie	224	195
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	228	255
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	227	265
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	245	365
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	223	290
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	204	220
2004	June	4		3/4-in. Mesh Trapnet	Bluegill	163	100
2004	June	1	W	3/4-in. Mesh Trapnet	Bluegill	270	258
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	215	220
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	222	235
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	237	310
2004	June	3	E	3/4-in. Mesh Trapnet	Bluegill	226	285
2004	June	1	E	3/4-in. Mesh Trapnet	Brown Bullhead	250	220
2004	June	1	W	3/4-in. Mesh Trapnet	Fallfish	42	15
2004	June	5		3/4-in. Mesh Trapnet	Largemouth Bass	365	650
2004	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	223	275
2004	June	1	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	151	75
2004	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	206	240
2004	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	190	135
2004	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	279	450
2004	June	1	E	3/4-in. Mesh Trapnet	Rock Bass	220	235
2004	June	3	E	3/4-in. Mesh Trapnet	Rock Bass	157	85
2004	June	3	E	3/4-in. Mesh Trapnet	Rock Bass	195	215
2004	June	3	E	3/4-in. Mesh Trapnet	Rock Bass	240	335
2004	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	221	202
2004	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	227	250
2004	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	200	170
2004	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	166	95
2004	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	95	25
2004	June	1	E	3/4-in. Mesh Trapnet	Rock Bass	245	325
2004	June	1	E	3/4-in. Mesh Trapnet	Rock Bass	176	120

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	3	E	3/4-in. Mesh Trapnet	Rock Bass	231	250
2004	June	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	209	145
2004	June	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	192	80
2004	June	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	189	85
2004	June	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	115	10
2004	June	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	446	1150
2004	June	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	289	300
2004	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	247	215
2004	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	207	135
2004	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	252	260
2004	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	191	80
2004	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	177	60
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	451	1200
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	118	8
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	139	15
2004	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	66	3
2004	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	242	195
2004	June	4		3/4-in. Mesh Trapnet	Smallmouth Bass	70	3
2004	June	4		3/4-in. Mesh Trapnet	Smallmouth Bass	61	2
2004	June	4		3/4-in. Mesh Trapnet	Smallmouth Bass	62	2
2004	June	4		3/4-in. Mesh Trapnet	Smallmouth Bass	60	2
2004	June	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	435	1100
2004	June	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	434	1050
2004	June	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	157	50
2004	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	420	900
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	206	100
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	264	270
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	273	280
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	250	220
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	186	75
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	185	60
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	154	40
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	169	45
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	214	120
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	125	5
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	212	235
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	192	80
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	172	55

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	177	65
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	180	60
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	123	2
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	119	1
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	160	35
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	141	10
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	180	55
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	171	55
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	215	130
2004	June	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	206	120
2004	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	233	160
2004	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	75	1
2004	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	228	125
2004	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	174	70
2004	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	175	60
2004	June	2	W	3/4-in. Mesh Trapnet	White Sucker	360	500
2004	June	3	E	3/4-in. Mesh Trapnet	Yellow Bullhead	182	70
2004	July	3	E	3/4-in. Mesh Trapnet	Black Crappie	361	684
2004	July	3	E	3/4-in. Mesh Trapnet	Bluegill	237	260
2004	July	3	E	3/4-in. Mesh Trapnet	Bluegill	231	297
2004	July	2	W	3/4-in. Mesh Trapnet	Bluegill	217	235
2004	July	1	E	3/4-in. Mesh Trapnet	Bluegill	248	360
2004	July	4		3/4-in. Mesh Trapnet	Bluegill	105	21
2004	July	4		3/4-in. Mesh Trapnet	Bluegill	82	9
2004	July	4		3/4-in. Mesh Trapnet	Largemouth Bass	90	14
2004	July	4		3/4-in. Mesh Trapnet	Largemouth Bass	80	12
2004	July	4		3/4-in. Mesh Trapnet	Largemouth Bass	78	8
2004	July	1	E	3/4-in. Mesh Trapnet	Margined Madtom	116	12
2004	July	4		3/4-in. Mesh Trapnet	Pumpkinseed	88	18
2004	July	4		3/4-in. Mesh Trapnet	Pumpkinseed	75	9
2004	July	1	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	168	87
2004	July	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	178	130
2004	July	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	129	44
2004	July	1	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	115	31
2004	July	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	156	89
2004	July	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	181	130
2004	July	2	W	3/4-in. Mesh Trapnet	Rock Bass	210	180
2004	July	3	E	3/4-in. Mesh Trapnet	Rock Bass	227	264

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	July	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	255	210
2004	July	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	111	14
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	285	300
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	287	285
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	223	140
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	189	85
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	189	77
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	200	82
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	187	70
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	122	20
2004	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	110	20
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	125	21
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	113	18
2004	July	4		3/4-in. Mesh Trapnet	Smallmouth Bass	75	5
2004	July	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	260	278
2004	July	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	258	270
2004	July	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	117	28
2004	July	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	135	41
2004	July	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	195	112
2004	July	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	203	121
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	283	295
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	195	146
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	149	63
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	131	38
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	130	32
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	129	30
2004	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	145	46
2004	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	135	39
2004	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	106	14
2004	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	108	18
2004	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	88	10
2004	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	275	275
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	96	10
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	85	8
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	93	10
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	90	9
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	98	11
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	94	10

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	99	12
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	111	20
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	117	22
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	181	84
2004	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	255	238
2004	July	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	135	22
2004	July	1	W	3/4-in. Mesh Trapnet	White Sucker	378	512
2004	July	3	E	3/4-in. Mesh Trapnet	Yellow Perch	223	120
2004	August	2	W	3/4-in. Mesh Trapnet	American Eel	730	1200
2004	August	1	W	3/4-in. Mesh Trapnet	Black Crappie	281	430
2004	August	1	W	3/4-in. Mesh Trapnet	Black Crappie	277	362
2004	August	1	W	3/4-in. Mesh Trapnet	Black Crappie	284	427
2004	August	2	W	3/4-in. Mesh Trapnet	Black Crappie	287	364
2004	August	5		3/4-in. Mesh Trapnet	Bluegill	210	242
2004	August	5		3/4-in. Mesh Trapnet	Bluegill	184	146
2004	August	1	W	3/4-in. Mesh Trapnet	Bluegill	206	219
2004	August	3	E	3/4-in. Mesh Trapnet	Bluegill	216	238
2004	August	3	E	3/4-in. Mesh Trapnet	Bluegill	221	254
2004	August	2	W	3/4-in. Mesh Trapnet	Bluegill	233	288
2004	August	5		3/4-in. Mesh Trapnet	Bluegill	252	414
2004	August	2	W	3/4-in. Mesh Trapnet	Brown Bullhead	319	388
2004	August	5		3/4-in. Mesh Trapnet	Largemouth Bass	221	132
2004	August	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	161	82
2004	August	1	W	3/4-in. Mesh Trapnet	Rock Bass	226	262
2004	August	1	W	3/4-in. Mesh Trapnet	Rock Bass	234	251
2004	August	1	E	3/4-in. Mesh Trapnet	Rock Bass	230	273
2004	August	3	E	3/4-in. Mesh Trapnet	Rock Bass	90	11
2004	August	3	E	3/4-in. Mesh Trapnet	Rock Bass	145	68
2004	August	5		3/4-in. Mesh Trapnet	Rock Bass	245	298
2004	August	1	W	3/4-in. Mesh Trapnet	Rock Bass	231	255
2004	August	1	W	3/4-in. Mesh Trapnet	Rock Bass	188	137
2004	August	2	W	3/4-in. Mesh Trapnet	Rock Bass	229	371
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	434	900
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	460	850
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	253	239
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	265	271
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	224	168
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	239	202

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	284	308
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	330	474
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	230	159
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	241	208
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	235	196
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	294	90
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	131	32
2004	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	266	198
2004	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	241	188
2004	August	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	182	68
2004	August	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	199	108
2004	August	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	136	38
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	222	138
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	235	190
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	219	149
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	223	166
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	199	104
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	140	33
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	138	29
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	236	163
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	175	61
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	152	36
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	165	34
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	154	31
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	281	256
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	152	49
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	74	8
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	63	6
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	75	8
2004	August	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	57	5
2004	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	379	691
2004	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	324	404
2004	August	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	291	358
2004	August	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	200	111
2004	August	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	79	12
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	270	268
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	228	146
2004	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	343	648

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	141	34
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	179	62
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	156	42
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	166	54
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	141	28
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	162	47
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	148	33
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	112	12
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	136	28
2004	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	131	26
2004	August	4		3/4-in. Mesh Trapnet	Smallmouth Bass	120	23
2004	September	5		3/4-in. Mesh Trapnet	Black Crappie	252	280
2004	September	3	E	3/4-in. Mesh Trapnet	Bluegill	225	255
2004	September	2	W	3/4-in. Mesh Trapnet	Bluegill	233	330
2004	September	3	E	3/4-in. Mesh Trapnet	Bluegill	113	32
2004	September	1	E	3/4-in. Mesh Trapnet	Chain Pickerel	336	218
2004	September	1	W	3/4-in. Mesh Trapnet	Eastern Silvery Minnow	62	1
2004	September	1	W	3/4-in. Mesh Trapnet	Eastern Silvery Minnow	64	1
2004	September	1	W	3/4-in. Mesh Trapnet	Eastern Silvery Minnow	65	1
2004	September	1	E	3/4-in. Mesh Trapnet	Eastern Silvery Minnow	74	2
2004	September	1	W	3/4-in. Mesh Trapnet	Fallfish	130	8
2004	September	1	E	3/4-in. Mesh Trapnet	Fallfish	124	12
2004	September	1	E	3/4-in. Mesh Trapnet	Fallfish	167	34
2004	September	2	W	3/4-in. Mesh Trapnet	Pumpkinseed	127	50
2004	September	3	E	3/4-in. Mesh Trapnet	Pumpkinseed	132	40
2004	September	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	142	65
2004	September	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	244	368
2004	September	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	124	35
2004	September	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	155	82
2004	September	2	W	3/4-in. Mesh Trapnet	Rock Bass	236	323
2004	September	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	460	1250
2004	September	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	308	
2004	September	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	330	500
2004	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	85	8
2004	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	82	6
2004	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	394	800
2004	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	250	212
2004	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	502	1800

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	280	318
2004	September	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	138	38
2004	September	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	251	231
2004	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	465	1450
2004	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	326	520
2004	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	144	45
2004	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	195	86
2004	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	165	52
2004	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	161	46
2004	September	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	195	195
2004	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	76	6
2004	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	205	115
2004	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	106	11
2004	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	80	5
2004	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	77	5
2004	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	58	2
2004	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	436	1200
2004	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	302	380
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	91	9
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	101	10
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	98	7
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	92	7
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	65	2
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	66	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	60	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	67	2
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	60	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	62	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	60	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	65	2
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	61	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	67	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	66	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	61	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	55	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	65	2
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	64	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	79	3

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	56	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	81	5
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	92	5
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	95	4
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	85	4
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	90	4
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	56	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	57	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	65	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	94	5
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	70	3
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	100	5
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	100	6
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	57	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	55	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	100	5
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	59	1
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	72	2
2004	September	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	67	1
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	104	5
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	115	5
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	107	5
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	95	3
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	95	4
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	103	4
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	103	4
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	95	6
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	103	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	110	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	103	7
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	108	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	102	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	93	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	104	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	98	6
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	104	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	112	11
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	97	6

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	108	12
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	98	7
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	102	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	100	5
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	105	7
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	103	7
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	106	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	107	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	107	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	105	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	104	6
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	98	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	102	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	102	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	103	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	104	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	113	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	113	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	108	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	108	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	112	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	93	6
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	102	8
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	97	6
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	101	9
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	105	7
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	100	10
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	113	11
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	103	9
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	103	9
2004	September	1	E	3/4-in. Mesh Trapnet	Spottail Shiner		
2004	September	1	W	3/4-in. Mesh Trapnet	White Sucker	392	770
2004	September	1	W	3/4-in. Mesh Trapnet	Yellow Bullhead	221	160
2004	September	1	E	3/4-in. Mesh Trapnet	Yellow Perch	55	1
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	224	272
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	38	1
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	40	1
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	49	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	38	1
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	32	1
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	36	1
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	45	1
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	214	270
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	236	395
2004	October	2	W	3/4-in. Mesh Trapnet	Bluegill	230	278
2004	October	2	W	3/4-in. Mesh Trapnet	Largemouth Bass	85	5
2004	October	2	W	3/4-in. Mesh Trapnet	Largemouth Bass	169	80
2004	October	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	131	46
2004	October	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	164	112
2004	October	2	W	3/4-in. Mesh Trapnet	Rock Bass	164	102
2004	October	5		3/4-in. Mesh Trapnet	Rock Bass	195	151
2004	October	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	328	518
2004	October	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	155	60
2004	October	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	135	38
2004	October	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	148	44
2004	October	5		3/4-in. Mesh Trapnet	Smallmouth Bass	338	454
2004	October	5		3/4-in. Mesh Trapnet	Smallmouth Bass	312	435
2004	October	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	138	42
2004	October	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	192	125
2004	October	5		3/4-in. Mesh Trapnet	Smallmouth Bass	351	650
2004	October	5		3/4-in. Mesh Trapnet	Smallmouth Bass	367	700
2004	October	5		3/4-in. Mesh Trapnet	Smallmouth Bass	302	315
2004	October	5		3/4-in. Mesh Trapnet	Smallmouth Bass	258	170
2004	October	5		3/4-in. Mesh Trapnet	Smallmouth Bass	242	160
2004	October	5		3/4-in. Mesh Trapnet	Smallmouth Bass	223	105
2004	October	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	128	29
2004	October	2	W	3/4-in. Mesh Trapnet	White Sucker	426	1000
2004	October	2	W	3/4-in. Mesh Trapnet	White Sucker	398	830
2004	October	1	E	3/4-in. Mesh Trapnet	Yellow Bullhead	202	118
2004	December	5		3/4-in. Mesh Trapnet	Black Crappie	260	248
2004	December	5		3/4-in. Mesh Trapnet	Black Crappie	272	359
2004	December	5		3/4-in. Mesh Trapnet	Black Crappie	281	356
2004	December	4		3/4-in. Mesh Trapnet	Black Crappie	182	92
2004	December	5		3/4-in. Mesh Trapnet	Bluegill	215	278
2004	December	5		3/4-in. Mesh Trapnet	Bluegill	216	239
2004	December	5		3/4-in. Mesh Trapnet	Bluegill	224	275

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	91	18
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	186	150
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	214	228
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	175	112
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	216	242
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	176	128
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	164	102
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	181	140
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	176	119
2004	December	4		3/4-in. Mesh Trapnet	Bluegill	161	90
2004	December	4		3/4-in. Mesh Trapnet	Largemouth Bass	371	862
2004	December	3	E	3/4-in. Mesh Trapnet	Pumpkinseed	119	34
2004	December	5		3/4-in. Mesh Trapnet	Pumpkinseed	151	78
2004	December	5		3/4-in. Mesh Trapnet	Pumpkinseed	151	73
2004	December	1	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	142	50
2004	December	4		3/4-in. Mesh Trapnet	Redbreast Sunfish	174	99
2004	December	5		3/4-in. Mesh Trapnet	Redbreast Sunfish	158	75
2004	December	4		3/4-in. Mesh Trapnet	Redbreast Sunfish	213	231
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	259	381
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	260	399
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	229	261
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	248	356
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	260	401
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	231	264
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	252	338
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	196	161
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	211	212
2004	December	4		3/4-in. Mesh Trapnet	Rock Bass	171	102
2004	December	3	E	3/4-in. Mesh Trapnet	Rock Bass	51	3
2004	December	5		3/4-in. Mesh Trapnet	Rock Bass	240	296
2004	December	4		3/4-in. Mesh Trapnet	Rock Bass	198	152
2004	December	5		3/4-in. Mesh Trapnet	Smallmouth Bass	447	1500
2004	December	5		3/4-in. Mesh Trapnet	Smallmouth Bass	418	1250
2004	December	5		3/4-in. Mesh Trapnet	Smallmouth Bass	328	368
2004	December	5		3/4-in. Mesh Trapnet	Smallmouth Bass	353	672
2004	December	5		3/4-in. Mesh Trapnet	Smallmouth Bass	419	1220
2004	December	4		3/4-in. Mesh Trapnet	Smallmouth Bass	227	148
2004	December	5		3/4-in. Mesh Trapnet	Smallmouth Bass	401	872

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	60	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	61	1
2004	December	3	E	3/4-in. Mesh Trapnet	Spottail Shiner	62	1
2004	December	3	E	3/4-in. Mesh Trapnet	Spottail Shiner	62	1
2004	December	3	E	3/4-in. Mesh Trapnet	Spottail Shiner	60	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	105	12
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	58	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	100	9
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	120	14
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	103	11
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	62	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	61	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	98	9
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	66	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	68	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	102	8
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	86	6
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	64	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	62	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	59	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	57	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	64	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	75	3
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	58	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	69	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	53	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	65	2
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	63	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	60	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	59	1
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	115	15
2004	December	2	W	3/4-in. Mesh Trapnet	Spottail Shiner	62	1
2004	December	2	W	3/4-in. Mesh Trapnet	White Sucker	211	89
2004	December	2	W	3/4-in. Mesh Trapnet	Yellow Perch	168	54
2004	April	14	E	Electrofishing	American Eel	550	315
2004	April	18		Electrofishing	Black Crappie	182	60
2004	April	18		Electrofishing	Black Crappie	231	185
2004	April	18		Electrofishing	Bluegill	187	110

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	18		Electrofishing	Bluegill	196	130
2004	April	18		Electrofishing	Bluegill	234	280
2004	April	18		Electrofishing	Bluegill	184	100
2004	April	18		Electrofishing	Bluegill	250	310
2004	April	18		Electrofishing	Bluegill	197	160
2004	April	18		Electrofishing	Bluegill	211	225
2004	April	18		Electrofishing	Bluegill	227	230
2004	April	18		Electrofishing	Bluegill	227	260
2004	April	18		Electrofishing	Bluegill	200	150
2004	April	13	W	Electrofishing	Bluegill	235	305
2004	April	13	W	Electrofishing	Brown Bullhead	205	110
2004	April	18		Electrofishing	Chain Pickerel	378	300
2004	April	12	E	Electrofishing	Fallfish	174	45
2004	April	11	E	Electrofishing	Golden Shiner	80	4
2004	April	11	E	Electrofishing	Golden Shiner	127	18
2004	April	11	E	Electrofishing	Golden Shiner	60	2
2004	April	11	E	Electrofishing	Golden Shiner	120	18
2004	April	14	W	Electrofishing	Golden Shiner	71	3
2004	April	14	W	Electrofishing	Golden Shiner	70	3
2004	April	14	W	Electrofishing	Golden Shiner	85	4
2004	April	14	W	Electrofishing	Golden Shiner	72	3
2004	April	14	W	Electrofishing	Golden Shiner	75	3
2004	April	14	W	Electrofishing	Golden Shiner	80	3
2004	April	14	W	Electrofishing	Golden Shiner	70	3
2004	April	14	W	Electrofishing	Golden Shiner	99	4
2004	April	14	W	Electrofishing	Golden Shiner	69	3
2004	April	14	W	Electrofishing	Golden Shiner	70	3
2004	April	14	W	Electrofishing	Golden Shiner	66	3
2004	April	14	W	Electrofishing	Golden Shiner	62	2
2004	April	14	E	Electrofishing	Golden Shiner	62	2
2004	April	17		Electrofishing	Largemouth Bass	445	1500
2004	April	18		Electrofishing	Largemouth Bass	538	2750
2004	April	18		Electrofishing	Largemouth Bass	461	2000
2004	April	18		Electrofishing	Largemouth Bass	542	2400
2004	April	18		Electrofishing	Largemouth Bass	351	500
2004	April	18		Electrofishing	Largemouth Bass	455	1600
2004	April	18		Electrofishing	Largemouth Bass	382	900
2004	April	18		Electrofishing	Largemouth Bass	418	1100

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	18		Electrofishing	Largemouth Bass	423	1200
2004	April	18		Electrofishing	Largemouth Bass	460	1550
2004	April	18		Electrofishing	Largemouth Bass	394	1050
2004	April	18		Electrofishing	Largemouth Bass	380	1000
2004	April	18		Electrofishing	Largemouth Bass	213	500
2004	April	16		Electrofishing	Largemouth Bass	238	1000
2004	April	18		Electrofishing	Pumpkinseed	203	215
2004	April	18		Electrofishing	Pumpkinseed	164	105
2004	April	18		Electrofishing	Redbreast Sunfish	229	325
2004	April	14	W	Electrofishing	Redbreast Sunfish	109	30
2004	April	18		Electrofishing	Rock Bass	191	115
2004	April	18		Electrofishing	Rock Bass	112	35
2004	April	18		Electrofishing	Rock Bass	165	80
2004	April	11	W	Electrofishing	Rock Bass	240	300
2004	April	13	W	Electrofishing	Rock Bass	172	60
2004	April	11	E	Electrofishing	Smallmouth Bass	70	4
2004	April	16		Electrofishing	Smallmouth Bass	430	1100
2004	April	16		Electrofishing	Smallmouth Bass	477	1300
2004	April	16		Electrofishing	Smallmouth Bass	489	1550
2004	April	16		Electrofishing	Smallmouth Bass	492	1650
2004	April	13	W	Electrofishing	Smallmouth Bass	106	5
2004	April	15	W	Electrofishing	Smallmouth Bass	345	490
2004	April	11	E	Electrofishing	Spottail Shiner	86	4
2004	April	11	E	Electrofishing	Spottail Shiner	126	18
2004	April	11	E	Electrofishing	Spottail Shiner	57	1
2004	April	11	E	Electrofishing	Spottail Shiner	60	2
2004	April	11	E	Electrofishing	Spottail Shiner	47	1
2004	April	11	E	Electrofishing	Spottail Shiner	117	13
2004	April	11	E	Electrofishing	Spottail Shiner	50	1
2004	April	11	E	Electrofishing	Spottail Shiner	98	8
2004	April	11	E	Electrofishing	Spottail Shiner	50	1
2004	April	11	E	Electrofishing	Spottail Shiner	113	13
2004	April	11	E	Electrofishing	Spottail Shiner	48	1
2004	April	11	E	Electrofishing	Spottail Shiner	68	3
2004	April	11	E	Electrofishing	Spottail Shiner	35	1
2004	April	11	E	Electrofishing	Spottail Shiner	70	2
2004	April	11	E	Electrofishing	Spottail Shiner	40	1
2004	April	11	E	Electrofishing	Spottail Shiner	72	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	11	E	Electrofishing	Spottail Shiner	57	1
2004	April	11	E	Electrofishing	Spottail Shiner	58	1
2004	April	11	E	Electrofishing	Spottail Shiner	45	1
2004	April	11	E	Electrofishing	Spottail Shiner	54	1
2004	April	11	E	Electrofishing	Spottail Shiner	40	1
2004	April	11	E	Electrofishing	Spottail Shiner	58	1
2004	April	11	E	Electrofishing	Spottail Shiner	57	2
2004	April	11	E	Electrofishing	Spottail Shiner	73	2
2004	April	11	E	Electrofishing	Spottail Shiner	46	1
2004	April	11	E	Electrofishing	Spottail Shiner	67	1
2004	April	11	E	Electrofishing	Spottail Shiner	30	1
2004	April	11	E	Electrofishing	Spottail Shiner	55	1
2004	April	11	E	Electrofishing	Spottail Shiner	40	1
2004	April	11	E	Electrofishing	Spottail Shiner	59	1
2004	April	11	E	Electrofishing	Spottail Shiner	35	1
2004	April	11	E	Electrofishing	Spottail Shiner	57	2
2004	April	11	E	Electrofishing	Spottail Shiner	60	2
2004	April	11	E	Electrofishing	Spottail Shiner	68	2
2004	April	11	E	Electrofishing	Spottail Shiner	63	2
2004	April	11	E	Electrofishing	Spottail Shiner	67	2
2004	April	11	E	Electrofishing	Spottail Shiner	57	2
2004	April	11	E	Electrofishing	Spottail Shiner	72	2
2004	April	11	E	Electrofishing	Spottail Shiner	53	1
2004	April	11	E	Electrofishing	Spottail Shiner	72	2
2004	April	11	E	Electrofishing	Spottail Shiner	60	2
2004	April	11	E	Electrofishing	Spottail Shiner	62	1
2004	April	11	E	Electrofishing	Spottail Shiner	62	1
2004	April	11	E	Electrofishing	Spottail Shiner	75	3
2004	April	11	E	Electrofishing	Spottail Shiner	56	1
2004	April	11	E	Electrofishing	Spottail Shiner	58	2
2004	April	11	E	Electrofishing	Spottail Shiner	36	1
2004	April	11	E	Electrofishing	Spottail Shiner	67	2
2004	April	11	E	Electrofishing	Spottail Shiner	50	1
2004	April	11	E	Electrofishing	Spottail Shiner	58	2
2004	April	11	E	Electrofishing	Spottail Shiner	38	1
2004	April	11	E	Electrofishing	Spottail Shiner	55	2
2004	April	11	E	Electrofishing	Spottail Shiner	38	1
2004	April	11	E	Electrofishing	Spottail Shiner	49	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	11	E	Electrofishing	Spottail Shiner	32	1
2004	April	11	E	Electrofishing	Spottail Shiner	48	1
2004	April	11	E	Electrofishing	Spottail Shiner	40	1
2004	April	11	E	Electrofishing	Spottail Shiner	60	2
2004	April	11	E	Electrofishing	Spottail Shiner	38	1
2004	April	11	E	Electrofishing	Spottail Shiner	67	3
2004	April	11	E	Electrofishing	Spottail Shiner	55	2
2004	April	11	E	Electrofishing	Spottail Shiner	68	2
2004	April	11	E	Electrofishing	Spottail Shiner	50	1
2004	April	11	E	Electrofishing	Spottail Shiner	58	2
2004	April	11	E	Electrofishing	Spottail Shiner	32	1
2004	April	11	E	Electrofishing	Spottail Shiner	56	2
2004	April	11	E	Electrofishing	Spottail Shiner	31	1
2004	April	11	E	Electrofishing	Spottail Shiner	47	1
2004	April	11	E	Electrofishing	Spottail Shiner	55	2
2004	April	11	E	Electrofishing	Spottail Shiner	77	5
2004	April	11	E	Electrofishing	Spottail Shiner	40	1
2004	April	11	E	Electrofishing	Spottail Shiner	56	2
2004	April	11	E	Electrofishing	Spottail Shiner	33	1
2004	April	11	E	Electrofishing	Spottail Shiner	51	1
2004	April	11	E	Electrofishing	Spottail Shiner	58	2
2004	April	11	E	Electrofishing	Spottail Shiner	74	3
2004	April	11	E	Electrofishing	Spottail Shiner	52	1
2004	April	11	E	Electrofishing	Spottail Shiner	65	2
2004	April	11	E	Electrofishing	Spottail Shiner	57	1
2004	April	11	E	Electrofishing	Spottail Shiner	65	2
2004	April	11	E	Electrofishing	Spottail Shiner	40	1
2004	April	11	E	Electrofishing	Spottail Shiner	70	3
2004	April	11	E	Electrofishing	Spottail Shiner	33	1
2004	April	11	E	Electrofishing	Spottail Shiner	52	1
2004	April	11	E	Electrofishing	Spottail Shiner	35	1
2004	April	11	E	Electrofishing	Spottail Shiner	58	1
2004	April	11	E	Electrofishing	Spottail Shiner	37	1
2004	April	11	E	Electrofishing	Spottail Shiner	40	1
2004	April	11	E	Electrofishing	Spottail Shiner	53	2
2004	April	11	E	Electrofishing	Spottail Shiner	70	3
2004	April	11	E	Electrofishing	Spottail Shiner	55	2
2004	April	11	E	Electrofishing	Spottail Shiner	60	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	11	E	Electrofishing	Spottail Shiner	33	1
2004	April	11	E	Electrofishing	Spottail Shiner	65	2
2004	April	11	E	Electrofishing	Spottail Shiner	37	1
2004	April	11	E	Electrofishing	Spottail Shiner	67	3
2004	April	11	E	Electrofishing	Spottail Shiner	57	1
2004	April	11	E	Electrofishing	Spottail Shiner	63	2
2004	April	11	E	Electrofishing	Spottail Shiner	55	1
2004	April	11	E	Electrofishing	Spottail Shiner	60	2
2004	April	11	E	Electrofishing	Spottail Shiner		
2004	April	11	E	Electrofishing	Spottail Shiner		
2004	April	11	W	Electrofishing	Spottail Shiner	146	7
2004	April	11	W	Electrofishing	Spottail Shiner	170	30
2004	April	11	W	Electrofishing	Spottail Shiner	147	7
2004	April	11	W	Electrofishing	Spottail Shiner	165	25
2004	April	11	W	Electrofishing	Spottail Shiner	118	5
2004	April	11	W	Electrofishing	Spottail Shiner	128	7
2004	April	11	W	Electrofishing	Spottail Shiner	65	2
2004	April	11	W	Electrofishing	Spottail Shiner	113	5
2004	April	11	W	Electrofishing	Spottail Shiner	61	2
2004	April	11	W	Electrofishing	Spottail Shiner	132	7
2004	April	11	W	Electrofishing	Spottail Shiner	53	2
2004	April	11	W	Electrofishing	Spottail Shiner	100	5
2004	April	11	W	Electrofishing	Spottail Shiner	57	2
2004	April	11	W	Electrofishing	Spottail Shiner	127	5
2004	April	11	W	Electrofishing	Spottail Shiner	55	2
2004	April	11	W	Electrofishing	Spottail Shiner	61	2
2004	April	11	W	Electrofishing	Spottail Shiner	57	2
2004	April	11	W	Electrofishing	Spottail Shiner	60	2
2004	April	11	W	Electrofishing	Spottail Shiner	57	2
2004	April	11	W	Electrofishing	Spottail Shiner	60	2
2004	April	11	W	Electrofishing	Spottail Shiner	55	2
2004	April	11	W	Electrofishing	Spottail Shiner	75	3
2004	April	11	W	Electrofishing	Spottail Shiner	52	2
2004	April	11	W	Electrofishing	Spottail Shiner	62	2
2004	April	11	W	Electrofishing	Spottail Shiner	37	1
2004	April	11	W	Electrofishing	Spottail Shiner	56	2
2004	April	11	W	Electrofishing	Spottail Shiner	33	1
2004	April	11	W	Electrofishing	Spottail Shiner	55	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	11	W	Electrofishing	Spottail Shiner	61	3
2004	April	11	W	Electrofishing	Spottail Shiner	70	3
2004	April	11	W	Electrofishing	Spottail Shiner	40	1
2004	April	11	W	Electrofishing	Spottail Shiner	70	3
2004	April	11	W	Electrofishing	Spottail Shiner	60	2
2004	April	11	W	Electrofishing	Spottail Shiner	62	2
2004	April	11	W	Electrofishing	Spottail Shiner	52	2
2004	April	11	W	Electrofishing	Spottail Shiner	56	2
2004	April	11	W	Electrofishing	Spottail Shiner	55	2
2004	April	11	W	Electrofishing	Spottail Shiner	61	2
2004	April	11	W	Electrofishing	Spottail Shiner	57	2
2004	April	11	W	Electrofishing	Spottail Shiner	56	2
2004	April	11	W	Electrofishing	Spottail Shiner	34	1
2004	April	11	W	Electrofishing	Spottail Shiner	58	2
2004	April	11	W	Electrofishing	Spottail Shiner	57	2
2004	April	11	W	Electrofishing	Spottail Shiner	55	2
2004	April	11	W	Electrofishing	Spottail Shiner	59	2
2004	April	11	W	Electrofishing	Spottail Shiner	38	1
2004	April	11	W	Electrofishing	Spottail Shiner	62	3
2004	April	11	W	Electrofishing	Spottail Shiner	60	3
2004	April	11	W	Electrofishing	Spottail Shiner	59	3
2004	April	11	W	Electrofishing	Spottail Shiner	59	3
2004	April	11	W	Electrofishing	Spottail Shiner	40	1
2004	April	11	W	Electrofishing	Spottail Shiner	62	3
2004	April	11	W	Electrofishing	Spottail Shiner	57	2
2004	April	11	W	Electrofishing	Spottail Shiner	52	2
2004	April	11	W	Electrofishing	Spottail Shiner	40	1
2004	April	11	W	Electrofishing	Spottail Shiner	45	1
2004	April	11	W	Electrofishing	Spottail Shiner	40	1
2004	April	11	W	Electrofishing	Spottail Shiner	82	4
2004	April	12	W	Electrofishing	Spottail Shiner	128	4
2004	April	12	E	Electrofishing	Spottail Shiner	58	2
2004	April	12	E	Electrofishing	Spottail Shiner	59	2
2004	April	14	W	Electrofishing	Spottail Shiner	72	3
2004	April	14	W	Electrofishing	Spottail Shiner	74	3
2004	April	14	W	Electrofishing	Spottail Shiner	75	3
2004	April	14	W	Electrofishing	Spottail Shiner	66	3
2004	April	14	W	Electrofishing	Spottail Shiner	70	3

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	14	W	Electrofishing	Spottail Shiner	58	2
2004	April	14	W	Electrofishing	Spottail Shiner	63	2
2004	April	14	W	Electrofishing	Spottail Shiner	72	3
2004	April	14	W	Electrofishing	Spottail Shiner	75	3
2004	April	14	W	Electrofishing	Spottail Shiner	56	2
2004	April	14	W	Electrofishing	Spottail Shiner	63	2
2004	April	14	W	Electrofishing	Spottail Shiner	67	3
2004	April	14	W	Electrofishing	Spottail Shiner	56	2
2004	April	14	W	Electrofishing	Spottail Shiner	60	2
2004	April	14	W	Electrofishing	Spottail Shiner	80	3
2004	April	14	W	Electrofishing	Spottail Shiner	66	3
2004	April	14	W	Electrofishing	Spottail Shiner	64	2
2004	April	14	W	Electrofishing	Spottail Shiner	56	2
2004	April	14	W	Electrofishing	Spottail Shiner	63	2
2004	April	14	W	Electrofishing	Spottail Shiner	59	2
2004	April	14	W	Electrofishing	Spottail Shiner	66	3
2004	April	14	W	Electrofishing	Spottail Shiner	61	2
2004	April	14	W	Electrofishing	Spottail Shiner	67	3
2004	April	14	W	Electrofishing	Spottail Shiner	58	2
2004	April	14	W	Electrofishing	Spottail Shiner	60	2
2004	April	14	W	Electrofishing	Spottail Shiner	57	2
2004	April	14	W	Electrofishing	Spottail Shiner	56	2
2004	April	14	W	Electrofishing	Spottail Shiner	58	2
2004	April	14	W	Electrofishing	Spottail Shiner	60	2
2004	April	14	W	Electrofishing	Spottail Shiner	57	2
2004	April	14	W	Electrofishing	Spottail Shiner	60	2
2004	April	14	W	Electrofishing	Spottail Shiner	66	3
2004	April	14	W	Electrofishing	Spottail Shiner	56	2
2004	April	14	W	Electrofishing	Spottail Shiner	56	2
2004	April	14	W	Electrofishing	Spottail Shiner	67	3
2004	April	14	W	Electrofishing	Spottail Shiner	55	2
2004	April	14	W	Electrofishing	Spottail Shiner	72	3
2004	April	14	W	Electrofishing	Spottail Shiner	30	1
2004	April	14	W	Electrofishing	Spottail Shiner	30	1
2004	April	14	W	Electrofishing	Spottail Shiner	30	1
2004	April	14	W	Electrofishing	Spottail Shiner	68	3
2004	April	14	W	Electrofishing	Spottail Shiner	66	3
2004	April	14	W	Electrofishing	Spottail Shiner	61	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	14	W	Electrofishing	Spottail Shiner	57	2
2004	April	13	W	Electrofishing	Spottail Shiner	37	1
2004	April	13	W	Electrofishing	Spottail Shiner	36	1
2004	April	13	E	Electrofishing	Spottail Shiner	58	2
2004	April	13	E	Electrofishing	Spottail Shiner	63	2
2004	April	13	E	Electrofishing	Spottail Shiner	58	2
2004	April	13	E	Electrofishing	Spottail Shiner	59	2
2004	April	13	E	Electrofishing	Spottail Shiner	56	2
2004	April	13	E	Electrofishing	Spottail Shiner	65	2
2004	April	13	E	Electrofishing	Spottail Shiner	53	1
2004	April	13	E	Electrofishing	Spottail Shiner	64	2
2004	April	13	E	Electrofishing	Spottail Shiner	57	2
2004	April	13	E	Electrofishing	Spottail Shiner	58	2
2004	April	13	E	Electrofishing	Spottail Shiner	60	2
2004	April	13	E	Electrofishing	Spottail Shiner	72	3
2004	April	13	E	Electrofishing	Spottail Shiner	55	2
2004	April	13	E	Electrofishing	Spottail Shiner	58	2
2004	April	13	E	Electrofishing	Spottail Shiner	35	1
2004	April	13	E	Electrofishing	Spottail Shiner	50	1
2004	April	13	E	Electrofishing	Spottail Shiner	35	1
2004	April	13	E	Electrofishing	Spottail Shiner	65	2
2004	April	13	E	Electrofishing	Spottail Shiner	32	1
2004	April	13	E	Electrofishing	Spottail Shiner	33	1
2004	April	13	E	Electrofishing	Spottail Shiner	35	1
2004	April	13	E	Electrofishing	Spottail Shiner	70	3
2004	April	13	E	Electrofishing	Spottail Shiner	31	1
2004	April	13	E	Electrofishing	Spottail Shiner	65	3
2004	April	13	E	Electrofishing	Spottail Shiner	38	1
2004	April	13	E	Electrofishing	Spottail Shiner	60	2
2004	April	13	E	Electrofishing	Spottail Shiner	39	1
2004	April	13	E	Electrofishing	Spottail Shiner	65	3
2004	April	13	E	Electrofishing	Spottail Shiner	58	2
2004	April	13	E	Electrofishing	Spottail Shiner	56	2
2004	April	13	E	Electrofishing	Spottail Shiner	50	2
2004	April	13	E	Electrofishing	Spottail Shiner	31	1
2004	April	13	E	Electrofishing	Spottail Shiner	35	1
2004	April	13	E	Electrofishing	Spottail Shiner	33	1
2004	April	13	E	Electrofishing	Spottail Shiner	55	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	13	E	Electrofishing	Spottail Shiner	53	2
2004	April	13	E	Electrofishing	Spottail Shiner	35	1
2004	April	13	E	Electrofishing	Spottail Shiner	52	2
2004	April	13	E	Electrofishing	Spottail Shiner	32	1
2004	April	13	E	Electrofishing	Spottail Shiner	38	1
2004	April	13	E	Electrofishing	Spottail Shiner	36	1
2004	April	13	E	Electrofishing	Spottail Shiner	52	2
2004	April	13	E	Electrofishing	Spottail Shiner	30	1
2004	April	13	E	Electrofishing	Spottail Shiner	58	2
2004	April	13	E	Electrofishing	Spottail Shiner	59	2
2004	April	13	E	Electrofishing	Spottail Shiner	40	1
2004	April	13	E	Electrofishing	Spottail Shiner	35	1
2004	April	13	E	Electrofishing	Spottail Shiner	40	1
2004	April	13	E	Electrofishing	Spottail Shiner	40	1
2004	April	13	E	Electrofishing	Spottail Shiner	30	1
2004	April	13	E	Electrofishing	Spottail Shiner	57	2
2004	April	13	E	Electrofishing	Spottail Shiner	52	2
2004	April	13	E	Electrofishing	Spottail Shiner	40	1
2004	April	13	E	Electrofishing	Spottail Shiner	43	1
2004	April	13	E	Electrofishing	Spottail Shiner	30	1
2004	April	13	E	Electrofishing	Spottail Shiner	33	1
2004	April	13	E	Electrofishing	Spottail Shiner	35	1
2004	April	13	E	Electrofishing	Spottail Shiner	39	1
2004	April	13	E	Electrofishing	Spottail Shiner	34	1
2004	April	13	E	Electrofishing	Spottail Shiner	32	1
2004	April	13	E	Electrofishing	Spottail Shiner	38	1
2004	April	13	E	Electrofishing	Spottail Shiner	32	1
2004	April	13	E	Electrofishing	Spottail Shiner	31	1
2004	April	13	E	Electrofishing	Spottail Shiner	29	1
2004	April	13	E	Electrofishing	Spottail Shiner		
2004	April	14	E	Electrofishing	Spottail Shiner	56	1
2004	April	14	E	Electrofishing	Spottail Shiner	55	1
2004	April	14	E	Electrofishing	Spottail Shiner	61	2
2004	April	11	E	Electrofishing	Tessellated Darter	48	1
2004	April	11	E	Electrofishing	Tessellated Darter	69	3
2004	April	12	E	Electrofishing	Tessellated Darter	55	2
2004	April	13	W	Electrofishing	Tessellated Darter	56	2
2004	April	15	E	Electrofishing	Tessellated Darter	57	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	15	E	Electrofishing	Tessellated Darter	59	3
2004	April	15	E	Electrofishing	Tessellated Darter	52	2
2004	April	11	E	Electrofishing	White Sucker	442	950
2004	April	18		Electrofishing	White Sucker	404	600
2004	April	18		Electrofishing	White Sucker	460	1100
2004	April	18		Electrofishing	White Sucker	448	900
2004	April	18		Electrofishing	White Sucker	508	1600
2004	April	18		Electrofishing	White Sucker	408	500
2004	April	18		Electrofishing	White Sucker	490	1200
2004	April	11	W	Electrofishing	White Sucker	368	600
2004	April	11	W	Electrofishing	White Sucker	445	1100
2004	April	11	W	Electrofishing	White Sucker	478	1350
2004	April	11	W	Electrofishing	White Sucker	482	1400
2004	April	11	W	Electrofishing	White Sucker	508	1450
2004	April	11	W	Electrofishing	White Sucker	434	950
2004	April	11	W	Electrofishing	White Sucker	410	800
2004	April	12	W	Electrofishing	White Sucker	456	1000
2004	April	12	W	Electrofishing	White Sucker	493	1400
2004	April	12	E	Electrofishing	White Sucker	479	1500
2004	April	12	E	Electrofishing	White Sucker	493	1600
2004	April	12	E	Electrofishing	White Sucker	354	600
2004	April	12	E	Electrofishing	White Sucker	480	1450
2004	April	14	W	Electrofishing	White Sucker	442	1000
2004	April	14	W	Electrofishing	White Sucker	481	1100
2004	April	14	W	Electrofishing	White Sucker	441	1000
2004	April	14	W	Electrofishing	White Sucker	513	1650
2004	April	14	E	Electrofishing	White Sucker	40	900
2004	April	14	E	Electrofishing	White Sucker	473	1250
2004	April	14	E	Electrofishing	White Sucker	503	1350
2004	April	15	W	Electrofishing	White Sucker	338	390
2004	April	15	W	Electrofishing	White Sucker	478	1200
2004	April	15	W	Electrofishing	White Sucker	462	1100
2004	April	15	W	Electrofishing	White Sucker	477	1200
2004	April	15	W	Electrofishing	White Sucker	480	1200
2004	April	18		Electrofishing	Yellow Perch	166	30
2004	April	18		Electrofishing	Yellow Perch	220	90
2004	April	18		Electrofishing	Yellow Perch	234	120
2004	April	11	W	Electrofishing	Yellow Perch	213	105

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	April	12	E	Electrofishing	Yellow Perch	160	25
2004	April	12	E	Electrofishing	Yellow Perch	252	175
2004	April	13	W	Electrofishing	Yellow Perch	271	120
2004	May	13	W	Electrofishing	American Eel	600	240
2004	May	11	W	Electrofishing	Black Crappie	180	85
2004	May	18		Electrofishing	Black Crappie	212	130
2004	May	12	W	Electrofishing	Bluegill	174	90
2004	May	18		Electrofishing	Bluegill	182	160
2004	May	18		Electrofishing	Bluegill	234	250
2004	May	18		Electrofishing	Bluegill	208	150
2004	May	18		Electrofishing	Bluegill	183	120
2004	May	17		Electrofishing	Bluegill	225	200
2004	May	17		Electrofishing	Bluegill	208	150
2004	May	17		Electrofishing	Bluegill	200	125
2004	May	16		Electrofishing	Bluegill	205	170
2004	May	16		Electrofishing	Bluegill	187	160
2004	May	16		Electrofishing	Bluegill	194	200
2004	May	16		Electrofishing	Bluegill	242	280
2004	May	16		Electrofishing	Bluegill	211	120
2004	May	13	W	Electrofishing	Brown Trout	204	100
2004	May	11	W	Electrofishing	Fallfish	173	50
2004	May	11	W	Electrofishing	Fallfish	117	20
2004	May	11	E	Electrofishing	Fallfish	259	160
2004	May	12	W	Electrofishing	Fallfish	157	20
2004	May	13	W	Electrofishing	Fallfish	291	200
2004	May	13	W	Electrofishing	Fallfish	126	30
2004	May	13	W	Electrofishing	Fallfish	147	30
2004	May	14	W	Electrofishing	Fallfish	90	5
2004	May	14	W	Electrofishing	Fallfish	141	25
2004	May	14	W	Electrofishing	Fallfish	144	30
2004	May	13	E	Electrofishing	Fallfish	214	140
2004	May	13	E	Electrofishing	Fallfish	201	100
2004	May	13	E	Electrofishing	Fallfish	190	80
2004	May	13	E	Electrofishing	Fallfish	77	8
2004	May	13	E	Electrofishing	Fallfish	92	9
2004	May	13	E	Electrofishing	Fallfish	85	8
2004	May	13	E	Electrofishing	Fallfish	74	7
2004	May	13	E	Electrofishing	Fallfish	80	8

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	May	15	W	Electrofishing	Fallfish	194	100
2004	May	15	W	Electrofishing	Fallfish	170	85
2004	May	11	W	Electrofishing	Golden Shiner	59	2
2004	May	13	W	Electrofishing	Golden Shiner	85	6
2004	May	14	W	Electrofishing	Golden Shiner	82	4
2004	May	14	W	Electrofishing	Golden Shiner	66	2
2004	May	14	W	Electrofishing	Golden Shiner	62	2
2004	May	14	W	Electrofishing	Golden Shiner	67	3
2004	May	14	W	Electrofishing	Golden Shiner	52	2
2004	May	14	W	Electrofishing	Golden Shiner	47	1
2004	May	14	W	Electrofishing	Golden Shiner	55	2
2004	May	14	W	Electrofishing	Golden Shiner	74	4
2004	May	18		Electrofishing	Largemouth Bass	405	1800
2004	May	18		Electrofishing	Pumpkinseed	190	140
2004	May	12	W	Electrofishing	Redbreast Sunfish	80	15
2004	May	18		Electrofishing	Redbreast Sunfish	195	180
2004	May	16		Electrofishing	Redbreast Sunfish	212	230
2004	May	16		Electrofishing	Redbreast Sunfish	210	200
2004	May	16		Electrofishing	Redbreast Sunfish	204	180
2004	May	11	W	Electrofishing	Smallmouth Bass	285	200
2004	May	12	E	Electrofishing	Smallmouth Bass	271	300
2004	May	12	E	Electrofishing	Smallmouth Bass	228	180
2004	May	12	W	Electrofishing	Smallmouth Bass	176	50
2004	May	18		Electrofishing	Smallmouth Bass	485	2000
2004	May	18		Electrofishing	Smallmouth Bass	483	1900
2004	May	18		Electrofishing	Smallmouth Bass	455	1600
2004	May	17		Electrofishing	Smallmouth Bass	234	190
2004	May	16		Electrofishing	Smallmouth Bass	153	60
2004	May	13	W	Electrofishing	Smallmouth Bass	184	70
2004	May	14	W	Electrofishing	Smallmouth Bass	103	5
2004	May	11	W	Electrofishing	Spottail Shiner	55	1
2004	May	11	W	Electrofishing	Spottail Shiner	51	1
2004	May	11	W	Electrofishing	Spottail Shiner	58	1
2004	May	11	W	Electrofishing	Spottail Shiner	70	2
2004	May	11	W	Electrofishing	Spottail Shiner	62	1
2004	May	11	W	Electrofishing	Spottail Shiner	62	2
2004	May	11	W	Electrofishing	Spottail Shiner	38	1
2004	May	11	E	Electrofishing	Spottail Shiner	66	3

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	May	13	W	Electrofishing	Spottail Shiner	65	2
2004	May	13	W	Electrofishing	Spottail Shiner	68	2
2004	May	13	W	Electrofishing	Spottail Shiner	75	3
2004	May	13	W	Electrofishing	Spottail Shiner	82	3
2004	May	13	W	Electrofishing	Spottail Shiner	61	2
2004	May	13	W	Electrofishing	Spottail Shiner	55	2
2004	May	13	W	Electrofishing	Spottail Shiner	65	2
2004	May	13	W	Electrofishing	Spottail Shiner	64	2
2004	May	13	W	Electrofishing	Spottail Shiner	63	2
2004	May	13	W	Electrofishing	Spottail Shiner	65	2
2004	May	13	W	Electrofishing	Spottail Shiner	62	2
2004	May	13	W	Electrofishing	Spottail Shiner	64	2
2004	May	13	W	Electrofishing	Spottail Shiner	63	2
2004	May	14	W	Electrofishing	Spottail Shiner	62	2
2004	May	14	W	Electrofishing	Spottail Shiner	87	3
2004	May	14	W	Electrofishing	Spottail Shiner	54	1
2004	May	14	W	Electrofishing	Spottail Shiner	45	1
2004	May	14	W	Electrofishing	Spottail Shiner	68	3
2004	May	14	W	Electrofishing	Spottail Shiner	65	3
2004	May	14	W	Electrofishing	Spottail Shiner	66	2
2004	May	14	W	Electrofishing	Spottail Shiner	84	4
2004	May	14	W	Electrofishing	Spottail Shiner	65	2
2004	May	14	W	Electrofishing	Spottail Shiner	67	2
2004	May	14	W	Electrofishing	Spottail Shiner	42	1
2004	May	14	W	Electrofishing	Spottail Shiner	75	3
2004	May	14	W	Electrofishing	Spottail Shiner	43	1
2004	May	14	W	Electrofishing	Spottail Shiner	81	3
2004	May	14	W	Electrofishing	Spottail Shiner	67	3
2004	May	14	W	Electrofishing	Spottail Shiner	34	1
2004	May	14	W	Electrofishing	Spottail Shiner	60	2
2004	May	14	W	Electrofishing	Spottail Shiner	68	3
2004	May	14	W	Electrofishing	Spottail Shiner	69	3
2004	May	14	W	Electrofishing	Spottail Shiner	77	3
2004	May	14	W	Electrofishing	Spottail Shiner	70	3
2004	May	14	W	Electrofishing	Spottail Shiner	58	2
2004	May	14	W	Electrofishing	Spottail Shiner	71	3
2004	May	14	W	Electrofishing	Spottail Shiner	60	2
2004	May	14	W	Electrofishing	Spottail Shiner	69	3

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	May	14	W	Electrofishing	Spottail Shiner	37	1
2004	May	14	W	Electrofishing	Spottail Shiner	34	1
2004	May	11	W	Electrofishing	Unidentified	449	1200
2004	May	11	W	Electrofishing	Unidentified	470	1300
2004	May	11	W	Electrofishing	Unidentified	425	800
2004	May	11	W	Electrofishing	White Sucker	391	500
2004	May	12	E	Electrofishing	White Sucker	367	500
2004	May	12	E	Electrofishing	White Sucker	322	400
2004	May	12	E	Electrofishing	White Sucker	453	1000
2004	May	18		Electrofishing	White Sucker	376	500
2004	May	18		Electrofishing	White Sucker	431	900
2004	May	17		Electrofishing	White Sucker	426	800
2004	May	17		Electrofishing	White Sucker	402	750
2004	May	17		Electrofishing	White Sucker	340	400
2004	May	13	W	Electrofishing	White Sucker	408	800
2004	May	13	W	Electrofishing	White Sucker	442	700
2004	May	13	W	Electrofishing	White Sucker	525	1700
2004	May	13	W	Electrofishing	White Sucker	498	1200
2004	May	13	W	Electrofishing	White Sucker	504	1300
2004	May	13	W	Electrofishing	White Sucker	409	600
2004	May	13	W	Electrofishing	White Sucker	392	500
2004	May	13	W	Electrofishing	White Sucker	517	1500
2004	May	13	W	Electrofishing	White Sucker	431	800
2004	May	13	W	Electrofishing	White Sucker	483	1400
2004	May	13	W	Electrofishing	White Sucker	382	500
2004	May	13	E	Electrofishing	White Sucker	457	800
2004	May	13	E	Electrofishing	White Sucker	478	1100
2004	May	13	E	Electrofishing	White Sucker	432	700
2004	May	13	E	Electrofishing	White Sucker	491	1000
2004	May	13	E	Electrofishing	White Sucker	448	800
2004	May	13	E	Electrofishing	White Sucker	522	1500
2004	May	13	E	Electrofishing	White Sucker	503	1200
2004	May	14	E	Electrofishing	White Sucker	468	850
2004	May	14	E	Electrofishing	White Sucker	496	1100
2004	May	15	W	Electrofishing	White Sucker	430	680
2004	May	15	W	Electrofishing	White Sucker	447	700
2004	May	15	W	Electrofishing	White Sucker	342	400
2004	May	15	W	Electrofishing	White Sucker	412	500

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	May	15	W	Electrofishing	White Sucker	425	525
2004	May	15	E	Electrofishing	White Sucker	441	1000
2004	May	15	E	Electrofishing	White Sucker	463	1050
2004	May	15	E	Electrofishing	White Sucker	364	900
2004	May	11	W	Electrofishing	Yellow Perch	223	100
2004	May	11	W	Electrofishing	Yellow Perch	218	120
2004	May	11	W	Electrofishing	Yellow Perch	77	15
2004	May	11	W	Electrofishing	Yellow Perch	61	3
2004	May	11	W	Electrofishing	Yellow Perch	77	4
2004	May	13	W	Electrofishing	Yellow Perch	270	150
2004	May	14	W	Electrofishing	Yellow Perch	252	190
2004	June	13	W	Electrofishing	American Eel	275	50
2004	June	13	W	Electrofishing	American Eel	480	230
2004	June	13	W	Electrofishing	American Eel	523	250
2004	June	14	W	Electrofishing	American Eel	357	100
2004	June	15	W	Electrofishing	American Eel	535	310
2004	June	18		Electrofishing	Black Crappie	187	72
2004	June	18		Electrofishing	Black Crappie	200	112
2004	June	18		Electrofishing	Black Crappie	213	120
2004	June	14	W	Electrofishing	Black Crappie	193	80
2004	June	14	E	Electrofishing	Black Crappie	258	247
2004	June	14	E	Electrofishing	Black Crappie	271	290
2004	June	11	E	Electrofishing	Bluegill	52	3
2004	June	12	W	Electrofishing	Bluegill	219	185
2004	June	12	E	Electrofishing	Bluegill	190	165
2004	June	12	E	Electrofishing	Bluegill	47	2
2004	June	12	E	Electrofishing	Bluegill	45	2
2004	June	12	E	Electrofishing	Bluegill	64	14
2004	June	18		Electrofishing	Bluegill	164	85
2004	June	18		Electrofishing	Bluegill	175	100
2004	June	18		Electrofishing	Bluegill	204	195
2004	June	18		Electrofishing	Bluegill	194	172
2004	June	18		Electrofishing	Bluegill	185	140
2004	June	18		Electrofishing	Bluegill	211	240
2004	June	18		Electrofishing	Bluegill	184	120
2004	June	18		Electrofishing	Bluegill	200	145
2004	June	18		Electrofishing	Bluegill	175	100
2004	June	18		Electrofishing	Bluegill	194	135

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	18		Electrofishing	Bluegill	178	110
2004	June	18		Electrofishing	Bluegill	160	95
2004	June	18		Electrofishing	Bluegill	126	35
2004	June	18		Electrofishing	Bluegill	130	55
2004	June	18		Electrofishing	Bluegill	95	25
2004	June	18		Electrofishing	Bluegill	168	85
2004	June	18		Electrofishing	Bluegill	183	155
2004	June	18		Electrofishing	Bluegill	112	35
2004	June	18		Electrofishing	Bluegill	187	155
2004	June	18		Electrofishing	Bluegill	81	75
2004	June	18		Electrofishing	Bluegill	103	25
2004	June	18		Electrofishing	Bluegill	130	40
2004	June	18		Electrofishing	Bluegill	78	12
2004	June	18		Electrofishing	Bluegill	92	10
2004	June	18		Electrofishing	Bluegill	80	12
2004	June	18		Electrofishing	Bluegill	68	6
2004	June	17		Electrofishing	Bluegill	90	25
2004	June	13	W	Electrofishing	Bluegill	222	250
2004	June	13	E	Electrofishing	Bluegill	201	175
2004	June	13	E	Electrofishing	Bluegill	133	60
2004	June	13	E	Electrofishing	Bluegill	53	3
2004	June	14	W	Electrofishing	Bluegill	159	94
2004	June	14	W	Electrofishing	Bluegill	170	100
2004	June	14	E	Electrofishing	Bluegill	188	160
2004	June	15	W	Electrofishing	Bluegill	209	200
2004	June	15	W	Electrofishing	Bluegill	227	272
2004	June	15	E	Electrofishing	Bluegill	212	212
2004	June	15	E	Electrofishing	Bluegill	67	6
2004	June	11	W	Electrofishing	Chain Pickerel	574	1250
2004	June	12	W	Electrofishing	Chain Pickerel	222	56
2004	June	12	E	Electrofishing	Chain Pickerel	178	35
2004	June	11	W	Electrofishing	Fallfish	132	23
2004	June	11	W	Electrofishing	Fallfish	145	20
2004	June	11	W	Electrofishing	Fallfish	125	22
2004	June	11	W	Electrofishing	Fallfish	75	4
2004	June	11	W	Electrofishing	Fallfish	72	4
2004	June	11	W	Electrofishing	Fallfish	76	4
2004	June	11	E	Electrofishing	Fallfish	207	80

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	11	E	Electrofishing	Fallfish	137	28
2004	June	11	E	Electrofishing	Fallfish	136	21
2004	June	11	E	Electrofishing	Fallfish	136	25
2004	June	11	E	Electrofishing	Fallfish	83	5
2004	June	11	E	Electrofishing	Fallfish	237	150
2004	June	11	E	Electrofishing	Fallfish	137	40
2004	June	11	E	Electrofishing	Fallfish	95	8
2004	June	12	W	Electrofishing	Fallfish	140	35
2004	June	12	W	Electrofishing	Fallfish	136	37
2004	June	12	W	Electrofishing	Fallfish	105	18
2004	June	12	E	Electrofishing	Fallfish	99	12
2004	June	13	E	Electrofishing	Fallfish	192	77
2004	June	15	W	Electrofishing	Fallfish	168	50
2004	June	11	W	Electrofishing	Golden Shiner	98	7
2004	June	18		Electrofishing	Largemouth Bass	564	2400
2004	June	18		Electrofishing	Largemouth Bass	349	600
2004	June	18		Electrofishing	Largemouth Bass	322	450
2004	June	18		Electrofishing	Largemouth Bass	352	600
2004	June	18		Electrofishing	Largemouth Bass	72	4
2004	June	18		Electrofishing	Largemouth Bass	52	2
2004	June	18		Electrofishing	Largemouth Bass	68	4
2004	June	18		Electrofishing	Largemouth Bass	46	1
2004	June	16		Electrofishing	Largemouth Bass	69	4
2004	June	13	W	Electrofishing	Largemouth Bass	371	800
2004	June	13	W	Electrofishing	Largemouth Bass	445	1350
2004	June	13	W	Electrofishing	Largemouth Bass	445	1350
2004	June	13	W	Electrofishing	Largemouth Bass	373	830
2004	June	13	W	Electrofishing	Largemouth Bass	450	1460
2004	June	13	W	Electrofishing	Largemouth Bass	62	3
2004	June	13	W	Electrofishing	Largemouth Bass	330	500
2004	June	13	W	Electrofishing	Largemouth Bass	356	650
2004	June	13	W	Electrofishing	Largemouth Bass	62	3
2004	June	13	W	Electrofishing	Largemouth Bass	62	4
2004	June	13	W	Electrofishing	Largemouth Bass	55	3
2004	June	13	W	Electrofishing	Largemouth Bass	64	3
2004	June	13	W	Electrofishing	Largemouth Bass	56	3
2004	June	13	W	Electrofishing	Largemouth Bass	56	3
2004	June	13	W	Electrofishing	Largemouth Bass	80	4

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	14	W	Electrofishing	Largemouth Bass	380	800
2004	June	14	W	Electrofishing	Largemouth Bass	373	700
2004	June	14	E	Electrofishing	Largemouth Bass	371	700
2004	June	14	E	Electrofishing	Largemouth Bass	314	350
2004	June	15	E	Electrofishing	Largemouth Bass	76	4
2004	June	15	E	Electrofishing	Largemouth Bass	85	6
2004	June	15	E	Electrofishing	Largemouth Bass	73	5
2004	June	15	E	Electrofishing	Largemouth Bass	57	3
2004	June	12	E	Electrofishing	Pumpkinseed	93	28
2004	June	18		Electrofishing	Pumpkinseed	71	6
2004	June	18		Electrofishing	Pumpkinseed	146	62
2004	June	18		Electrofishing	Pumpkinseed	114	32
2004	June	18		Electrofishing	Pumpkinseed	108	32
2004	June	13	W	Electrofishing	Pumpkinseed	116	31
2004	June	13	E	Electrofishing	Pumpkinseed	69	11
2004	June	11	W	Electrofishing	Redbreast Sunfish	127	40
2004	June	11	E	Electrofishing	Redbreast Sunfish	144	86
2004	June	11	E	Electrofishing	Redbreast Sunfish	122	40
2004	June	11	E	Electrofishing	Redbreast Sunfish	113	24
2004	June	11	E	Electrofishing	Redbreast Sunfish	126	38
2004	June	12	W	Electrofishing	Redbreast Sunfish	160	95
2004	June	12	W	Electrofishing	Redbreast Sunfish	125	40
2004	June	12	W	Electrofishing	Redbreast Sunfish	98	20
2004	June	12	W	Electrofishing	Redbreast Sunfish	90	12
2004	June	12	E	Electrofishing	Redbreast Sunfish	148	76
2004	June	12	E	Electrofishing	Redbreast Sunfish	105	34
2004	June	12	E	Electrofishing	Redbreast Sunfish	80	14
2004	June	17		Electrofishing	Redbreast Sunfish	143	65
2004	June	17		Electrofishing	Redbreast Sunfish	126	25
2004	June	13	W	Electrofishing	Redbreast Sunfish	94	12
2004	June	13	W	Electrofishing	Redbreast Sunfish	141	52
2004	June	13	E	Electrofishing	Redbreast Sunfish	65	12
2004	June	13	E	Electrofishing	Redbreast Sunfish	117	40
2004	June	13	E	Electrofishing	Redbreast Sunfish	112	28
2004	June	14	W	Electrofishing	Redbreast Sunfish	102	28
2004	June	14	W	Electrofishing	Redbreast Sunfish	122	44
2004	June	14	W	Electrofishing	Redbreast Sunfish	118	42
2004	June	14	W	Electrofishing	Redbreast Sunfish	119	37

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	14	W	Electrofishing	Redbreast Sunfish	218	230
2004	June	14	W	Electrofishing	Redbreast Sunfish	132	50
2004	June	15	W	Electrofishing	Redbreast Sunfish	159	90
2004	June	15	W	Electrofishing	Redbreast Sunfish	104	25
2004	June	15	E	Electrofishing	Redbreast Sunfish	167	73
2004	June	15	E	Electrofishing	Redbreast Sunfish	89	18
2004	June	15	E	Electrofishing	Redbreast Sunfish	97	23
2004	June	15	E	Electrofishing	Redbreast Sunfish	88	20
2004	June	15	E	Electrofishing	Redbreast Sunfish	173	110
2004	June	15	E	Electrofishing	Redbreast Sunfish	106	22
2004	June	15	E	Electrofishing	Redbreast Sunfish	135	52
2004	June	15	E	Electrofishing	Redbreast Sunfish	144	52
2004	June	15	E	Electrofishing	Redbreast Sunfish	113	40
2004	June	15	E	Electrofishing	Redbreast Sunfish	126	38
2004	June	12	W	Electrofishing	Rock Bass	199	155
2004	June	18		Electrofishing	Rock Bass	208	205
2004	June	18		Electrofishing	Rock Bass	181	115
2004	June	11	W	Electrofishing	Smallmouth Bass	112	18
2004	June	11	E	Electrofishing	Smallmouth Bass	455	1150
2004	June	11	E	Electrofishing	Smallmouth Bass	265	225
2004	June	12	W	Electrofishing	Smallmouth Bass	376	600
2004	June	12	W	Electrofishing	Smallmouth Bass	190	88
2004	June	12	E	Electrofishing	Smallmouth Bass	122	18
2004	June	12	E	Electrofishing	Smallmouth Bass	76	12
2004	June	13	W	Electrofishing	Smallmouth Bass	86	5
2004	June	13	W	Electrofishing	Smallmouth Bass	74	4
2004	June	13	W	Electrofishing	Smallmouth Bass	77	4
2004	June	13	W	Electrofishing	Smallmouth Bass	86	5
2004	June	13	W	Electrofishing	Smallmouth Bass	70	5
2004	June	13	E	Electrofishing	Smallmouth Bass	129	35
2004	June	15	W	Electrofishing	Smallmouth Bass	143	28
2004	June	15	W	Electrofishing	Smallmouth Bass	123	16
2004	June	15	W	Electrofishing	Smallmouth Bass	127	28
2004	June	15	W	Electrofishing	Smallmouth Bass	105	18
2004	June	15	E	Electrofishing	Smallmouth Bass	129	23
2004	June	11	W	Electrofishing	Spottail Shiner	109	9
2004	June	11	W	Electrofishing	Spottail Shiner	74	4
2004	June	11	W	Electrofishing	Spottail Shiner	83	5

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	11	W	Electrofishing	Spottail Shiner	78	4
2004	June	11	W	Electrofishing	Spottail Shiner	80	4
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	46	1
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	58	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	52	2
2004	June	11	W	Electrofishing	Spottail Shiner	41	1
2004	June	11	W	Electrofishing	Spottail Shiner	46	1
2004	June	11	W	Electrofishing	Spottail Shiner	57	2
2004	June	11	W	Electrofishing	Spottail Shiner	65	2
2004	June	11	W	Electrofishing	Spottail Shiner	43	1
2004	June	11	W	Electrofishing	Spottail Shiner	47	1
2004	June	11	W	Electrofishing	Spottail Shiner	40	1
2004	June	11	W	Electrofishing	Spottail Shiner	66	3
2004	June	11	W	Electrofishing	Spottail Shiner	40	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	41	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	46	1
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	52	2
2004	June	11	W	Electrofishing	Spottail Shiner	50	2
2004	June	11	W	Electrofishing	Spottail Shiner	51	2
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	50	2
2004	June	11	W	Electrofishing	Spottail Shiner	40	1
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	46	1
2004	June	11	W	Electrofishing	Spottail Shiner	50	2
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	65	3
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	44	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	54	2
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	76	4
2004	June	11	W	Electrofishing	Spottail Shiner	43	1
2004	June	11	W	Electrofishing	Spottail Shiner	74	4
2004	June	11	W	Electrofishing	Spottail Shiner	35	1
2004	June	11	W	Electrofishing	Spottail Shiner	75	4
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	65	3
2004	June	11	W	Electrofishing	Spottail Shiner	56	2
2004	June	11	W	Electrofishing	Spottail Shiner	60	3
2004	June	11	W	Electrofishing	Spottail Shiner	47	1
2004	June	11	W	Electrofishing	Spottail Shiner	50	2
2004	June	11	W	Electrofishing	Spottail Shiner	41	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	47	1
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	109	8
2004	June	11	W	Electrofishing	Spottail Shiner	47	1
2004	June	11	W	Electrofishing	Spottail Shiner	87	4
2004	June	11	W	Electrofishing	Spottail Shiner	46	1
2004	June	11	W	Electrofishing	Spottail Shiner	82	4
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	56	2
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	55	2
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	56	2
2004	June	11	W	Electrofishing	Spottail Shiner	41	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	43	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	52	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	41	1
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	43	1
2004	June	11	W	Electrofishing	Spottail Shiner	50	2
2004	June	11	W	Electrofishing	Spottail Shiner	35	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	43	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	46	1
2004	June	11	W	Electrofishing	Spottail Shiner	49	1
2004	June	11	W	Electrofishing	Spottail Shiner	42	1
2004	June	11	W	Electrofishing	Spottail Shiner	49	1
2004	June	11	W	Electrofishing	Spottail Shiner	45	1
2004	June	11	W	Electrofishing	Spottail Shiner	52	2
2004	June	11	W	Electrofishing	Spottail Shiner	40	1
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	43	1
2004	June	11	W	Electrofishing	Spottail Shiner	47	1
2004	June	11	W	Electrofishing	Spottail Shiner	44	1
2004	June	11	W	Electrofishing	Spottail Shiner	52	2
2004	June	11	W	Electrofishing	Spottail Shiner		
2004	June	11	W	Electrofishing	Spottail Shiner		
2004	June	11	E	Electrofishing	Spottail Shiner	85	5
2004	June	11	E	Electrofishing	Spottail Shiner	78	3
2004	June	11	E	Electrofishing	Spottail Shiner	67	3
2004	June	11	E	Electrofishing	Spottail Shiner	71	3
2004	June	11	E	Electrofishing	Spottail Shiner	60	2
2004	June	11	E	Electrofishing	Spottail Shiner	62	2
2004	June	12	E	Electrofishing	Spottail Shiner	70	4
2004	June	12	E	Electrofishing	Spottail Shiner	63	2
2004	June	12	E	Electrofishing	Spottail Shiner	87	4
2004	June	12	E	Electrofishing	Spottail Shiner	67	3
2004	June	12	E	Electrofishing	Spottail Shiner	80	3
2004	June	12	E	Electrofishing	Spottail Shiner	78	3
2004	June	12	E	Electrofishing	Spottail Shiner	73	3
2004	June	12	E	Electrofishing	Spottail Shiner	76	3

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	12	E	Electrofishing	Spottail Shiner	81	4
2004	June	12	E	Electrofishing	Spottail Shiner	80	4
2004	June	12	E	Electrofishing	Spottail Shiner	74	3
2004	June	12	E	Electrofishing	Spottail Shiner	80	4
2004	June	12	E	Electrofishing	Spottail Shiner	79	3
2004	June	12	E	Electrofishing	Spottail Shiner	73	3
2004	June	12	E	Electrofishing	Spottail Shiner	68	3
2004	June	12	E	Electrofishing	Spottail Shiner	67	3
2004	June	12	E	Electrofishing	Spottail Shiner	76	3
2004	June	12	E	Electrofishing	Spottail Shiner	79	4
2004	June	12	E	Electrofishing	Spottail Shiner	75	3
2004	June	12	E	Electrofishing	Spottail Shiner	72	2
2004	June	12	E	Electrofishing	Spottail Shiner	72	3
2004	June	12	E	Electrofishing	Spottail Shiner	79	3
2004	June	12	E	Electrofishing	Spottail Shiner	80	3
2004	June	12	E	Electrofishing	Spottail Shiner	83	3
2004	June	12	E	Electrofishing	Spottail Shiner	44	1
2004	June	12	E	Electrofishing	Spottail Shiner	76	3
2004	June	12	E	Electrofishing	Spottail Shiner	78	3
2004	June	12	E	Electrofishing	Spottail Shiner	81	4
2004	June	12	E	Electrofishing	Spottail Shiner	68	3
2004	June	12	E	Electrofishing	Spottail Shiner	74	3
2004	June	12	E	Electrofishing	Spottail Shiner	46	2
2004	June	12	E	Electrofishing	Spottail Shiner	62	3
2004	June	12	E	Electrofishing	Spottail Shiner	80	4
2004	June	12	E	Electrofishing	Spottail Shiner	44	1
2004	June	12	E	Electrofishing	Spottail Shiner	80	3
2004	June	12	E	Electrofishing	Spottail Shiner	69	2
2004	June	12	E	Electrofishing	Spottail Shiner	68	2
2004	June	12	E	Electrofishing	Spottail Shiner	77	2
2004	June	12	E	Electrofishing	Spottail Shiner	75	2
2004	June	12	E	Electrofishing	Spottail Shiner	82	3
2004	June	12	E	Electrofishing	Spottail Shiner	72	3
2004	June	12	E	Electrofishing	Spottail Shiner	57	2
2004	June	12	E	Electrofishing	Spottail Shiner	65	2
2004	June	12	E	Electrofishing	Spottail Shiner	67	3
2004	June	12	E	Electrofishing	Spottail Shiner	77	3
2004	June	12	E	Electrofishing	Spottail Shiner	80	3

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	12	E	Electrofishing	Spottail Shiner	81	3
2004	June	12	E	Electrofishing	Spottail Shiner	69	2
2004	June	12	E	Electrofishing	Spottail Shiner	67	2
2004	June	12	E	Electrofishing	Spottail Shiner		
2004	June	15	E	Electrofishing	Spottail Shiner	42	1
2004	June	15	E	Electrofishing	Spottail Shiner	45	1
2004	June	15	E	Electrofishing	Spottail Shiner	45	1
2004	June	15	E	Electrofishing	Spottail Shiner	46	1
2004	June	15	E	Electrofishing	Spottail Shiner	45	1
2004	June	15	E	Electrofishing	Spottail Shiner	40	1
2004	June	15	E	Electrofishing	Spottail Shiner	50	1
2004	June	15	E	Electrofishing	Spottail Shiner	46	1
2004	June	15	E	Electrofishing	Spottail Shiner	47	1
2004	June	15	E	Electrofishing	Spottail Shiner	48	1
2004	June	15	E	Electrofishing	Spottail Shiner	50	1
2004	June	15	E	Electrofishing	Spottail Shiner	42	1
2004	June	15	E	Electrofishing	Spottail Shiner	75	3
2004	June	15	E	Electrofishing	Spottail Shiner	72	3
2004	June	15	E	Electrofishing	Spottail Shiner	45	1
2004	June	15	E	Electrofishing	Spottail Shiner	45	1
2004	June	15	E	Electrofishing	Spottail Shiner	48	1
2004	June	15	E	Electrofishing	Spottail Shiner	44	1
2004	June	15	E	Electrofishing	Spottail Shiner	42	1
2004	June	15	E	Electrofishing	Spottail Shiner	46	1
2004	June	15	E	Electrofishing	Spottail Shiner	48	1
2004	June	15	E	Electrofishing	Spottail Shiner	44	1
2004	June	15	E	Electrofishing	Spottail Shiner	50	1
2004	June	15	E	Electrofishing	Spottail Shiner	47	1
2004	June	15	E	Electrofishing	Spottail Shiner	50	1
2004	June	15	E	Electrofishing	Spottail Shiner	43	1
2004	June	15	E	Electrofishing	Spottail Shiner	46	1
2004	June	15	E	Electrofishing	Spottail Shiner	52	1
2004	June	15	E	Electrofishing	Spottail Shiner	50	1
2004	June	15	E	Electrofishing	Spottail Shiner	46	1
2004	June	15	E	Electrofishing	Spottail Shiner	45	1
2004	June	15	E	Electrofishing	Spottail Shiner	46	1
2004	June	15	E	Electrofishing	Spottail Shiner	45	1
2004	June	15	E	Electrofishing	Spottail Shiner	48	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	15	E	Electrofishing	Spottail Shiner	45	1
2004	June	15	E	Electrofishing	Spottail Shiner	48	1
2004	June	15	E	Electrofishing	Spottail Shiner	48	1
2004	June	15	E	Electrofishing	Spottail Shiner	44	1
2004	June	15	E	Electrofishing	Spottail Shiner	48	1
2004	June	15	E	Electrofishing	Spottail Shiner	48	1
2004	June	15	E	Electrofishing	Spottail Shiner	46	1
2004	June	15	E	Electrofishing	Spottail Shiner	47	1
2004	June	15	E	Electrofishing	Spottail Shiner	42	1
2004	June	11	E	Electrofishing	White Sucker	450	950
2004	June	11	E	Electrofishing	White Sucker	491	1550
2004	June	11	E	Electrofishing	White Sucker	342	425
2004	June	11	E	Electrofishing	White Sucker	453	990
2004	June	11	E	Electrofishing	White Sucker	198	80
2004	June	11	E	Electrofishing	White Sucker	345	430
2004	June	11	E	Electrofishing	White Sucker	379	550
2004	June	11	E	Electrofishing	White Sucker	392	700
2004	June	11	E	Electrofishing	White Sucker	360	575
2004	June	12	W	Electrofishing	White Sucker	473	1250
2004	June	12	W	Electrofishing	White Sucker	423	700
2004	June	12	W	Electrofishing	White Sucker	464	975
2004	June	12	W	Electrofishing	White Sucker	482	1100
2004	June	13	W	Electrofishing	White Sucker	352	580
2004	June	14	E	Electrofishing	White Sucker	447	950
2004	June	14	E	Electrofishing	White Sucker	414	750
2004	June	15	W	Electrofishing	White Sucker	480	250
2004	June	11	W	Electrofishing	Yellow Perch	210	110
2004	June	11	W	Electrofishing	Yellow Perch	210	100
2004	June	11	W	Electrofishing	Yellow Perch	117	20
2004	June	11	W	Electrofishing	Yellow Perch	124	20
2004	June	11	W	Electrofishing	Yellow Perch	87	8
2004	June	12	W	Electrofishing	Yellow Perch	194	75
2004	June	12	W	Electrofishing	Yellow Perch	157	30
2004	June	12	W	Electrofishing	Yellow Perch	282	
2004	June	12	W	Electrofishing	Yellow Perch	125	15
2004	June	12	W	Electrofishing	Yellow Perch	141	35
2004	June	12	E	Electrofishing	Yellow Perch	316	285
2004	June	12	E	Electrofishing	Yellow Perch	246	195

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	June	12	E	Electrofishing	Yellow Perch	247	175
2004	June	12	E	Electrofishing	Yellow Perch	193	80
2004	June	12	E	Electrofishing	Yellow Perch	193	82
2004	June	12	E	Electrofishing	Yellow Perch	130	30
2004	June	12	E	Electrofishing	Yellow Perch	147	38
2004	June	12	E	Electrofishing	Yellow Perch	116	22
2004	June	12	E	Electrofishing	Yellow Perch	135	27
2004	June	12	E	Electrofishing	Yellow Perch	112	11
2004	June	12	E	Electrofishing	Yellow Perch	130	44
2004	June	12	E	Electrofishing	Yellow Perch	85	8
2004	June	12	E	Electrofishing	Yellow Perch	132	48
2004	June	12	E	Electrofishing	Yellow Perch	87	11
2004	June	12	E	Electrofishing	Yellow Perch	127	24
2004	June	18		Electrofishing	Yellow Perch	120	12
2004	June	18		Electrofishing	Yellow Perch	108	8
2004	June	13	W	Electrofishing	Yellow Perch	114	11
2004	June	13	W	Electrofishing	Yellow Perch	99	8
2004	June	13	E	Electrofishing	Yellow Perch	154	50
2004	June	14	E	Electrofishing	Yellow Perch	217	112
2004	July	11	E	Electrofishing	American Eel	492	218
2004	July	11	E	Electrofishing	American Eel	430	138
2004	July	11	E	Electrofishing	American Eel	455	180
2004	July	11	E	Electrofishing	American Eel	340	80
2004	July	11	E	Electrofishing	American Eel	310	52
2004	July	11	W	Electrofishing	American Eel	630	570
2004	July	12	W	Electrofishing	American Eel	650	825
2004	July	14	W	Electrofishing	American Eel	270	49
2004	July	11	W	Electrofishing	Bluegill	211	218
2004	July	11	W	Electrofishing	Bluegill	215	278
2004	July	11	W	Electrofishing	Bluegill	210	228
2004	July	11	W	Electrofishing	Bluegill	231	238
2004	July	12	W	Electrofishing	Bluegill	207	175
2004	July	12	W	Electrofishing	Bluegill	230	302
2004	July	12	W	Electrofishing	Bluegill	212	200
2004	July	12	E	Electrofishing	Bluegill	226	215
2004	July	12	E	Electrofishing	Bluegill	230	245
2004	July	12	E	Electrofishing	Bluegill	237	268
2004	July	12	E	Electrofishing	Bluegill	215	220

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	July	12	E	Electrofishing	Bluegill	220	220
2004	July	12	E	Electrofishing	Bluegill	210	235
2004	July	12	E	Electrofishing	Bluegill	200	187
2004	July	12	E	Electrofishing	Bluegill	196	192
2004	July	18		Electrofishing	Bluegill	180	116
2004	July	18		Electrofishing	Bluegill	208	200
2004	July	18		Electrofishing	Bluegill	200	154
2004	July	18		Electrofishing	Bluegill	180	124
2004	July	18		Electrofishing	Bluegill	143	60
2004	July	18		Electrofishing	Bluegill	106	25
2004	July	18		Electrofishing	Bluegill	101	20
2004	July	18		Electrofishing	Bluegill	110	25
2004	July	18		Electrofishing	Bluegill	127	40
2004	July	18		Electrofishing	Bluegill	88	10
2004	July	18		Electrofishing	Bluegill	117	33
2004	July	18		Electrofishing	Bluegill	82	11
2004	July	18		Electrofishing	Bluegill	104	25
2004	July	18		Electrofishing	Bluegill	111	23
2004	July	18		Electrofishing	Bluegill	92	15
2004	July	13	W	Electrofishing	Bluegill	191	153
2004	July	13	E	Electrofishing	Bluegill	115	28
2004	July	14	W	Electrofishing	Bluegill	97	14
2004	July	14	W	Electrofishing	Bluegill	74	7
2004	July	14	W	Electrofishing	Bluegill	69	4
2004	July	14	E	Electrofishing	Bluegill	72	6
2004	July	15	W	Electrofishing	Bluegill	210	224
2004	July	15	E	Electrofishing	Bluegill	211	218
2004	July	15	E	Electrofishing	Bluegill	196	148
2004	July	11	W	Electrofishing	Chain Pickerel	106	6
2004	July	14	E	Electrofishing	Chain Pickerel	303	160
2004	July	11	E	Electrofishing	Fallfish	151	33
2004	July	11	E	Electrofishing	Fallfish	164	50
2004	July	11	W	Electrofishing	Fallfish	170	53
2004	July	12	W	Electrofishing	Fallfish	113	11
2004	July	12	E	Electrofishing	Fallfish	95	5
2004	July	12	E	Electrofishing	Fallfish	90	4
2004	July	12	E	Electrofishing	Fallfish	91	4
2004	July	12	E	Electrofishing	Fallfish	72	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	July	13	E	Electrofishing	Pumpkinseed	82	8
2004	July	13	E	Electrofishing	Pumpkinseed	74	9
2004	July	13	E	Electrofishing	Pumpkinseed	89	10
2004	July	11	E	Electrofishing	Redbreast Sunfish	140	52
2004	July	12	W	Electrofishing	Redbreast Sunfish	102	18
2004	July	12	E	Electrofishing	Redbreast Sunfish	103	22
2004	July	13	E	Electrofishing	Redbreast Sunfish	134	38
2004	July	13	E	Electrofishing	Redbreast Sunfish	136	36
2004	July	14	E	Electrofishing	Redbreast Sunfish	133	44
2004	July	14	E	Electrofishing	Redbreast Sunfish	104	15
2004	July	14	E	Electrofishing	Redbreast Sunfish	116	33
2004	July	15	W	Electrofishing	Redbreast Sunfish	97	17
2004	July	15	W	Electrofishing	Redbreast Sunfish	143	55
2004	July	15	W	Electrofishing	Redbreast Sunfish	177	108
2004	July	15	W	Electrofishing	Redbreast Sunfish	160	82
2004	July	15	W	Electrofishing	Redbreast Sunfish	132	50
2004	July	15	W	Electrofishing	Redbreast Sunfish	143	60
2004	July	15	E	Electrofishing	Redbreast Sunfish	151	70
2004	July	15	E	Electrofishing	Redbreast Sunfish	145	63
2004	July	11	E	Electrofishing	Smallmouth Bass	210	115
2004	July	11	W	Electrofishing	Smallmouth Bass	158	55
2004	July	12	E	Electrofishing	Smallmouth Bass	136	40
2004	July	12	E	Electrofishing	Smallmouth Bass	128	32
2004	July	13	W	Electrofishing	Smallmouth Bass	82	4
2004	July	13	W	Electrofishing	Smallmouth Bass	107	22
2004	July	13	W	Electrofishing	Smallmouth Bass	105	10
2004	July	13	W	Electrofishing	Smallmouth Bass	99	9
2004	July	14	E	Electrofishing	Smallmouth Bass	163	55
2004	July	14	E	Electrofishing	Smallmouth Bass	143	38
2004	July	14	E	Electrofishing	Smallmouth Bass	88	5
2004	July	11	W	Electrofishing	Spottail Shiner		
2004	July	11	W	Electrofishing	Spottail Shiner	76	81
2004	July	11	W	Electrofishing	Spottail Shiner	49	
2004	July	11	W	Electrofishing	Spottail Shiner	48	
2004	July	11	W	Electrofishing	Spottail Shiner	78	
2004	July	11	W	Electrofishing	Spottail Shiner	78	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	50	

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	78	
2004	July	11	W	Electrofishing	Spottail Shiner	51	
2004	July	11	W	Electrofishing	Spottail Shiner	47	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	45	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	48	
2004	July	11	W	Electrofishing	Spottail Shiner	77	
2004	July	11	W	Electrofishing	Spottail Shiner	75	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	49	
2004	July	11	W	Electrofishing	Spottail Shiner	79	
2004	July	11	W	Electrofishing	Spottail Shiner	46	
2004	July	11	W	Electrofishing	Spottail Shiner	76	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	62	
2004	July	11	W	Electrofishing	Spottail Shiner	54	
2004	July	11	W	Electrofishing	Spottail Shiner	55	
2004	July	11	W	Electrofishing	Spottail Shiner	51	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	56	
2004	July	11	W	Electrofishing	Spottail Shiner	79	
2004	July	11	W	Electrofishing	Spottail Shiner	48	
2004	July	11	W	Electrofishing	Spottail Shiner	46	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	48	
2004	July	11	W	Electrofishing	Spottail Shiner	46	
2004	July	11	W	Electrofishing	Spottail Shiner	48	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	52	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	47	

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	July	11	W	Electrofishing	Spottail Shiner	51	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	11	W	Electrofishing	Spottail Shiner	48	
2004	July	11	W	Electrofishing	Spottail Shiner	50	
2004	July	12	W	Electrofishing	Spottail Shiner	102	10
2004	July	12	W	Electrofishing	Spottail Shiner	99	9
2004	July	12	E	Electrofishing	Spottail Shiner	94	9
2004	July	12	E	Electrofishing	Spottail Shiner	81	4
2004	July	12	E	Electrofishing	Spottail Shiner	89	3
2004	July	12	E	Electrofishing	Spottail Shiner	79	3
2004	July	12	E	Electrofishing	Spottail Shiner	74	2
2004	July	12	E	Electrofishing	Spottail Shiner	87	4
2004	July	12	E	Electrofishing	Spottail Shiner	94	5
2004	July	12	E	Electrofishing	Spottail Shiner	80	3
2004	July	12	E	Electrofishing	Spottail Shiner	80	3
2004	July	12	E	Electrofishing	Spottail Shiner	82	4
2004	July	12	E	Electrofishing	Spottail Shiner	80	3
2004	July	12	E	Electrofishing	Spottail Shiner	85	3
2004	July	12	E	Electrofishing	Spottail Shiner	80	3
2004	July	12	E	Electrofishing	Spottail Shiner	83	3
2004	July	12	E	Electrofishing	Spottail Shiner	85	4
2004	July	12	E	Electrofishing	Spottail Shiner	88	4
2004	July	12	E	Electrofishing	Spottail Shiner	90	5
2004	July	12	E	Electrofishing	Spottail Shiner	90	4
2004	July	12	E	Electrofishing	Spottail Shiner	67	2
2004	July	12	E	Electrofishing	Spottail Shiner	48	1
2004	July	12	E	Electrofishing	Spottail Shiner	87	4
2004	July	12	E	Electrofishing	Spottail Shiner	80	3
2004	July	12	E	Electrofishing	Spottail Shiner	82	4
2004	July	12	E	Electrofishing	Spottail Shiner	99	8
2004	July	13	E	Electrofishing	Tessellated Darter	36	1
2004	July	11	E	Electrofishing	White Sucker	393	703
2004	July	11	E	Electrofishing	White Sucker	372	582
2004	July	11	W	Electrofishing	White Sucker	368	530
2004	July	12	W	Electrofishing	White Sucker	431	800
2004	July	12	W	Electrofishing	White Sucker	375	566
2004	July	12	W	Electrofishing	White Sucker	414	754

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	July	12	W	Electrofishing	White Sucker	360	470
2004	July	14	E	Electrofishing	White Sucker	335	435
2004	July	14	E	Electrofishing	White Sucker	365	493
2004	July	15	W	Electrofishing	White Sucker	444	784
2004	July	11	W	Electrofishing	Yellow Perch	148	35
2004	July	11	W	Electrofishing	Yellow Perch	184	89
2004	July	11	W	Electrofishing	Yellow Perch	188	78
2004	July	11	W	Electrofishing	Yellow Perch	135	30
2004	July	11	W	Electrofishing	Yellow Perch	136	38
2004	July	11	W	Electrofishing	Yellow Perch	119	26
2004	July	11	W	Electrofishing	Yellow Perch	144	33
2004	July	11	W	Electrofishing	Yellow Perch	122	20
2004	July	11	W	Electrofishing	Yellow Perch	139	30
2004	July	11	W	Electrofishing	Yellow Perch	128	22
2004	July	11	W	Electrofishing	Yellow Perch	120	16
2004	July	12	W	Electrofishing	Yellow Perch	87	5
2004	July	12	E	Electrofishing	Yellow Perch	214	109
2004	July	12	E	Electrofishing	Yellow Perch	204	105
2004	July	12	E	Electrofishing	Yellow Perch	143	30
2004	July	12	E	Electrofishing	Yellow Perch	114	19
2004	July	12	E	Electrofishing	Yellow Perch	109	10
2004	July	12	E	Electrofishing	Yellow Perch	212	115
2004	July	12	E	Electrofishing	Yellow Perch	157	50
2004	July	12	E	Electrofishing	Yellow Perch	135	31
2004	July	14	E	Electrofishing	Yellow Perch	173	60
2004	July	14	E	Electrofishing	Yellow Perch	183	65
2004	July	15	W	Electrofishing	Yellow Perch	159	52
2004	August	12	E	Electrofishing	Alewife	96	6
2004	August	12	E	Electrofishing	Alewife	84	4
2004	August	12	E	Electrofishing	Alewife	87	6
2004	August	12	E	Electrofishing	Alewife	79	4
2004	August	12	E	Electrofishing	Alewife	82	4
2004	August	12	E	Electrofishing	Alewife	76	4
2004	August	12	E	Electrofishing	Alewife	78	5
2004	August	12	E	Electrofishing	Alewife	90	8
2004	August	12	E	Electrofishing	Alewife	77	6
2004	August	12	E	Electrofishing	Alewife	90	8
2004	August	12	E	Electrofishing	Alewife		

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	12	E	Electrofishing	Alewife	77	2
2004	August	11	W	Electrofishing	Alewife	87	8
2004	August	11	W	Electrofishing	Alewife	80	7
2004	August	15	W	Electrofishing	Alewife	76	8
2004	August	15	W	Electrofishing	Alewife	80	8
2004	August	15	W	Electrofishing	Alewife	85	8
2004	August	15	W	Electrofishing	Alewife	82	8
2004	August	15	W	Electrofishing	Alewife	80	6
2004	August	12	W	Electrofishing	American Eel	320	50
2004	August	14	E	Electrofishing	Black Crappie	268	350
2004	August	13	E	Electrofishing	Bluegill	75	10
2004	August	12	W	Electrofishing	Bluegill	66	4
2004	August	12	E	Electrofishing	Bluegill	42	1
2004	August	12	E	Electrofishing	Bluegill	40	1
2004	August	12	E	Electrofishing	Bluegill	61	1
2004	August	12	E	Electrofishing	Bluegill	222	275
2004	August	11	W	Electrofishing	Bluegill	255	404
2004	August	15	E	Electrofishing	Bluegill	86	18
2004	August	15	E	Electrofishing	Bluegill	79	14
2004	August	15	E	Electrofishing	Bluegill	84	18
2004	August	15	E	Electrofishing	Bluegill	65	10
2004	August	15	E	Electrofishing	Bluegill	81	16
2004	August	15	E	Electrofishing	Bluegill	49	1
2004	August	15	E	Electrofishing	Bluegill	40	1
2004	August	15	E	Electrofishing	Bluegill	47	1
2004	August	15	E	Electrofishing	Bluegill	48	1
2004	August	15	E	Electrofishing	Bluegill	42	1
2004	August	15	E	Electrofishing	Bluegill	36	1
2004	August	15	E	Electrofishing	Bluegill	222	290
2004	August	18		Electrofishing	Bluegill	120	38
2004	August	18		Electrofishing	Bluegill	115	30
2004	August	18		Electrofishing	Bluegill	90	16
2004	August	18		Electrofishing	Bluegill	91	20
2004	August	18		Electrofishing	Bluegill	108	34
2004	August	12	E	Electrofishing	Chain Pickerel	167	35
2004	August	15	E	Electrofishing	Chain Pickerel	243	95
2004	August	12	E	Electrofishing	Common Shiner	120	20
2004	August	12	E	Electrofishing	Common Shiner	118	15

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	12	E	Electrofishing	Common Shiner	112	15
2004	August	12	E	Electrofishing	Common Shiner	116	15
2004	August	12	E	Electrofishing	Common Shiner	124	20
2004	August	12	E	Electrofishing	Common Shiner	117	20
2004	August	12	E	Electrofishing	Common Shiner	120	20
2004	August	12	E	Electrofishing	Common Shiner	130	25
2004	August	12	E	Electrofishing	Common Shiner	124	20
2004	August	12	E	Electrofishing	Common Shiner	109	15
2004	August	12	E	Electrofishing	Common Shiner	119	20
2004	August	11	E	Electrofishing	Common Shiner	102	15
2004	August	11	E	Electrofishing	Common Shiner	184	70
2004	August	11	W	Electrofishing	Common Shiner	119	20
2004	August	11	W	Electrofishing	Common Shiner	110	20
2004	August	11	W	Electrofishing	Common Shiner	109	16
2004	August	11	W	Electrofishing	Common Shiner	118	16
2004	August	11	W	Electrofishing	Common Shiner	100	12
2004	August	11	W	Electrofishing	Common Shiner	130	25
2004	August	11	W	Electrofishing	Common Shiner	108	16
2004	August	11	W	Electrofishing	Common Shiner	99	15
2004	August	11	W	Electrofishing	Common Shiner	107	15
2004	August	11	W	Electrofishing	Common Shiner	126	15
2004	August	11	W	Electrofishing	Common Shiner		
2004	August	11	W	Electrofishing	Common Shiner	127	20
2004	August	11	W	Electrofishing	Common Shiner	100	10
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	62	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	57	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	60	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	55	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	55	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	56	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	63	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	52	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	58	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	48	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	51	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow	58	20
2004	August	11	W	Electrofishing	Eastern Silvery Minnow		
2004	August	13	E	Electrofishing	Fallfish	136	30

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	13	E	Electrofishing	Fallfish	161	45
2004	August	12	E	Electrofishing	Fallfish	115	15
2004	August	12	E	Electrofishing	Fallfish	129	20
2004	August	12	E	Electrofishing	Fallfish	110	10
2004	August	12	E	Electrofishing	Fallfish	116	10
2004	August	12	E	Electrofishing	Fallfish	120	15
2004	August	12	E	Electrofishing	Fallfish	127	20
2004	August	12	E	Electrofishing	Fallfish	114	15
2004	August	12	E	Electrofishing	Fallfish	117	15
2004	August	12	E	Electrofishing	Fallfish	113	15
2004	August	12	E	Electrofishing	Fallfish	117	20
2004	August	12	E	Electrofishing	Fallfish	115	20
2004	August	12	E	Electrofishing	Fallfish	113	15
2004	August	12	E	Electrofishing	Fallfish	115	15
2004	August	12	E	Electrofishing	Fallfish	126	20
2004	August	12	E	Electrofishing	Fallfish	115	15
2004	August	12	E	Electrofishing	Fallfish		
2004	August	12	E	Electrofishing	Fallfish	115	40
2004	August	11	E	Electrofishing	Fallfish	235	155
2004	August	11	E	Electrofishing	Fallfish	93	5
2004	August	11	E	Electrofishing	Fallfish	97	10
2004	August	11	W	Electrofishing	Fallfish	85	8
2004	August	12	E	Electrofishing	Golden Shiner	119	10
2004	August	12	E	Electrofishing	Golden Shiner	118	20
2004	August	12	E	Electrofishing	Golden Shiner	120	20
2004	August	12	E	Electrofishing	Golden Shiner	126	25
2004	August	12	E	Electrofishing	Golden Shiner	103	10
2004	August	12	E	Electrofishing	Golden Shiner	110	10
2004	August	12	E	Electrofishing	Golden Shiner	110	10
2004	August	12	E	Electrofishing	Golden Shiner	110	15
2004	August	14	W	Electrofishing	Largemouth Bass	140	30
2004	August	14	W	Electrofishing	Largemouth Bass	68	10
2004	August	14	E	Electrofishing	Largemouth Bass	86	15
2004	August	14	E	Electrofishing	Largemouth Bass	125	30
2004	August	14	E	Electrofishing	Largemouth Bass	77	10
2004	August	14	E	Electrofishing	Largemouth Bass	107	25
2004	August	14	E	Electrofishing	Largemouth Bass	81	15
2004	August	14	E	Electrofishing	Largemouth Bass	228	30

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	14	E	Electrofishing	Largemouth Bass	147	50
2004	August	13	W	Electrofishing	Largemouth Bass	126	25
2004	August	13	W	Electrofishing	Largemouth Bass	127	25
2004	August	13	W	Electrofishing	Largemouth Bass	137	35
2004	August	13	W	Electrofishing	Largemouth Bass	119	20
2004	August	13	W	Electrofishing	Largemouth Bass	108	15
2004	August	13	W	Electrofishing	Largemouth Bass	112	15
2004	August	13	W	Electrofishing	Largemouth Bass	131	30
2004	August	13	E	Electrofishing	Largemouth Bass	475	1600
2004	August	13	E	Electrofishing	Largemouth Bass	90	10
2004	August	13	E	Electrofishing	Largemouth Bass	155	60
2004	August	13	E	Electrofishing	Largemouth Bass	135	40
2004	August	13	E	Electrofishing	Largemouth Bass	85	10
2004	August	13	E	Electrofishing	Largemouth Bass	141	35
2004	August	13	E	Electrofishing	Largemouth Bass	135	35
2004	August	13	E	Electrofishing	Largemouth Bass	120	25
2004	August	13	E	Electrofishing	Largemouth Bass	128	30
2004	August	13	E	Electrofishing	Largemouth Bass	123	25
2004	August	13	E	Electrofishing	Largemouth Bass	125	25
2004	August	13	E	Electrofishing	Largemouth Bass	118	20
2004	August	13	E	Electrofishing	Largemouth Bass	117	20
2004	August	12	W	Electrofishing	Largemouth Bass	66	5
2004	August	12	W	Electrofishing	Largemouth Bass	426	1050
2004	August	12	W	Electrofishing	Largemouth Bass	116	20
2004	August	12	E	Electrofishing	Largemouth Bass	415	1250
2004	August	12	E	Electrofishing	Largemouth Bass	346	575
2004	August	12	E	Electrofishing	Largemouth Bass	82	5
2004	August	12	E	Electrofishing	Largemouth Bass	150	40
2004	August	12	E	Electrofishing	Largemouth Bass	170	60
2004	August	12	E	Electrofishing	Largemouth Bass	79	4
2004	August	12	E	Electrofishing	Largemouth Bass	135	35
2004	August	12	E	Electrofishing	Largemouth Bass	119	25
2004	August	12	E	Electrofishing	Largemouth Bass	84	4
2004	August	12	E	Electrofishing	Largemouth Bass	133	25
2004	August	12	E	Electrofishing	Largemouth Bass	70	1
2004	August	12	E	Electrofishing	Largemouth Bass	68	1
2004	August	12	E	Electrofishing	Largemouth Bass	68	1
2004	August	12	E	Electrofishing	Largemouth Bass		

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	12	E	Electrofishing	Largemouth Bass	127	25
2004	August	12	E	Electrofishing	Largemouth Bass	91	10
2004	August	12	E	Electrofishing	Largemouth Bass	54	1
2004	August	12	E	Electrofishing	Largemouth Bass	76	5
2004	August	12	E	Electrofishing	Largemouth Bass	69	5
2004	August	12	E	Electrofishing	Largemouth Bass	156	55
2004	August	12	E	Electrofishing	Largemouth Bass	87	10
2004	August	12	E	Electrofishing	Largemouth Bass	78	5
2004	August	12	E	Electrofishing	Largemouth Bass	184	70
2004	August	12	E	Electrofishing	Largemouth Bass	70	2
2004	August	12	E	Electrofishing	Largemouth Bass		
2004	August	11	E	Electrofishing	Largemouth Bass	69	5
2004	August	11	E	Electrofishing	Largemouth Bass	138	35
2004	August	11	E	Electrofishing	Largemouth Bass	81	5
2004	August	11	E	Electrofishing	Largemouth Bass	107	20
2004	August	11	E	Electrofishing	Largemouth Bass	61	1
2004	August	11	E	Electrofishing	Largemouth Bass	162	50
2004	August	11	W	Electrofishing	Largemouth Bass	60	5
2004	August	11	W	Electrofishing	Largemouth Bass	163	60
2004	August	11	W	Electrofishing	Largemouth Bass	87	10
2004	August	11	W	Electrofishing	Largemouth Bass	65	6
2004	August	11	W	Electrofishing	Largemouth Bass	65	6
2004	August	11	W	Electrofishing	Largemouth Bass	432	1425
2004	August	11	W	Electrofishing	Largemouth Bass	335	600
2004	August	11	W	Electrofishing	Largemouth Bass	366	800
2004	August	11	W	Electrofishing	Largemouth Bass	177	70
2004	August	11	W	Electrofishing	Largemouth Bass	118	18
2004	August	11	W	Electrofishing	Largemouth Bass	65	5
2004	August	11	W	Electrofishing	Largemouth Bass	65	5
2004	August	15	W	Electrofishing	Largemouth Bass	147	45
2004	August	15	W	Electrofishing	Largemouth Bass	116	24
2004	August	15	W	Electrofishing	Largemouth Bass	123	26
2004	August	15	W	Electrofishing	Largemouth Bass	65	4
2004	August	15	W	Electrofishing	Largemouth Bass	126	35
2004	August	15	W	Electrofishing	Largemouth Bass	91	14
2004	August	15	W	Electrofishing	Largemouth Bass	99	16
2004	August	15	W	Electrofishing	Largemouth Bass	137	42
2004	August	15	W	Electrofishing	Largemouth Bass	140	42

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	15	E	Electrofishing	Largemouth Bass	75	10
2004	August	15	E	Electrofishing	Largemouth Bass	111	24
2004	August	15	E	Electrofishing	Largemouth Bass	77	10
2004	August	15	E	Electrofishing	Largemouth Bass	140	40
2004	August	15	E	Electrofishing	Largemouth Bass	119	25
2004	August	15	E	Electrofishing	Largemouth Bass	71	10
2004	August	15	E	Electrofishing	Largemouth Bass	78	10
2004	August	15	E	Electrofishing	Largemouth Bass	128	32
2004	August	15	E	Electrofishing	Largemouth Bass	115	25
2004	August	15	E	Electrofishing	Largemouth Bass	108	22
2004	August	15	E	Electrofishing	Largemouth Bass	142	42
2004	August	15	E	Electrofishing	Largemouth Bass	145	50
2004	August	18		Electrofishing	Largemouth Bass	82	10
2004	August	18		Electrofishing	Largemouth Bass	85	5
2004	August	14	W	Electrofishing	Pumpkinseed	107	25
2004	August	14	W	Electrofishing	Pumpkinseed	105	20
2004	August	14	W	Electrofishing	Pumpkinseed	105	25
2004	August	14	E	Electrofishing	Pumpkinseed	113	25
2004	August	13	E	Electrofishing	Pumpkinseed	98	20
2004	August	13	E	Electrofishing	Pumpkinseed	110	30
2004	August	13	E	Electrofishing	Pumpkinseed	105	25
2004	August	13	E	Electrofishing	Pumpkinseed	110	30
2004	August	13	E	Electrofishing	Pumpkinseed	100	25
2004	August	12	E	Electrofishing	Pumpkinseed	100	15
2004	August	11	W	Electrofishing	Pumpkinseed	106	25
2004	August	18		Electrofishing	Pumpkinseed	95	16
2004	August	18		Electrofishing	Pumpkinseed	96	22
2004	August	18		Electrofishing	Pumpkinseed	125	40
2004	August	18		Electrofishing	Pumpkinseed	109	26
2004	August	18		Electrofishing	Pumpkinseed	115	30
2004	August	18		Electrofishing	Pumpkinseed	96	20
2004	August	18		Electrofishing	Pumpkinseed	97	12
2004	August	18		Electrofishing	Pumpkinseed	110	30
2004	August	18		Electrofishing	Pumpkinseed	107	25
2004	August	18		Electrofishing	Pumpkinseed	97	20
2004	August	18		Electrofishing	Pumpkinseed		
2004	August	14	W	Electrofishing	Redbreast Sunfish	153	80
2004	August	14	W	Electrofishing	Redbreast Sunfish	147	75

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	14	W	Electrofishing	Redbreast Sunfish	121	35
2004	August	14	W	Electrofishing	Redbreast Sunfish	146	80
2004	August	14	W	Electrofishing	Redbreast Sunfish	159	80
2004	August	14	W	Electrofishing	Redbreast Sunfish	134	50
2004	August	14	E	Electrofishing	Redbreast Sunfish	86	25
2004	August	14	E	Electrofishing	Redbreast Sunfish	140	60
2004	August	14	E	Electrofishing	Redbreast Sunfish	90	30
2004	August	14	E	Electrofishing	Redbreast Sunfish	238	350
2004	August	13	W	Electrofishing	Redbreast Sunfish	164	80
2004	August	13	W	Electrofishing	Redbreast Sunfish	142	60
2004	August	13	E	Electrofishing	Redbreast Sunfish	141	55
2004	August	13	E	Electrofishing	Redbreast Sunfish	115	30
2004	August	13	E	Electrofishing	Redbreast Sunfish	142	70
2004	August	13	E	Electrofishing	Redbreast Sunfish	110	30
2004	August	13	E	Electrofishing	Redbreast Sunfish	98	20
2004	August	13	E	Electrofishing	Redbreast Sunfish	140	50
2004	August	13	E	Electrofishing	Redbreast Sunfish	110	30
2004	August	13	E	Electrofishing	Redbreast Sunfish	126	50
2004	August	13	E	Electrofishing	Redbreast Sunfish	135	50
2004	August	12	W	Electrofishing	Redbreast Sunfish	69	5
2004	August	12	E	Electrofishing	Redbreast Sunfish	125	
2004	August	11	E	Electrofishing	Redbreast Sunfish	119	40
2004	August	11	W	Electrofishing	Redbreast Sunfish	73	10
2004	August	11	W	Electrofishing	Redbreast Sunfish	135	45
2004	August	11	W	Electrofishing	Redbreast Sunfish	113	30
2004	August	15	W	Electrofishing	Redbreast Sunfish	67	10
2004	August	15	W	Electrofishing	Redbreast Sunfish	89	18
2004	August	15	W	Electrofishing	Redbreast Sunfish	153	80
2004	August	15	W	Electrofishing	Redbreast Sunfish	153	80
2004	August	15	W	Electrofishing	Redbreast Sunfish	175	100
2004	August	15	E	Electrofishing	Redbreast Sunfish	175	125
2004	August	15	E	Electrofishing	Redbreast Sunfish	103	25
2004	August	15	E	Electrofishing	Redbreast Sunfish	166	105
2004	August	15	E	Electrofishing	Redbreast Sunfish	182	135
2004	August	15	E	Electrofishing	Redbreast Sunfish	155	95
2004	August	15	E	Electrofishing	Redbreast Sunfish	135	
2004	August	15	E	Electrofishing	Redbreast Sunfish	35	1
2004	August	15	E	Electrofishing	Redbreast Sunfish	142	60

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	15	E	Electrofishing	Redbreast Sunfish	133	52
2004	August	15	E	Electrofishing	Redbreast Sunfish	147	65
2004	August	15	E	Electrofishing	Redbreast Sunfish	127	48
2004	August	15	E	Electrofishing	Redbreast Sunfish	138	56
2004	August	15	E	Electrofishing	Redbreast Sunfish	161	95
2004	August	15	E	Electrofishing	Redbreast Sunfish	128	40
2004	August	15	E	Electrofishing	Redbreast Sunfish	161	100
2004	August	15	E	Electrofishing	Redbreast Sunfish	150	80
2004	August	18		Electrofishing	Redbreast Sunfish	109	20
2004	August	12	E	Electrofishing	Rock Bass	97	20
2004	August	11	W	Electrofishing	Rock Bass	52	4
2004	August	14	W	Electrofishing	Smallmouth Bass	95	28
2004	August	14	W	Electrofishing	Smallmouth Bass	146	50
2004	August	14	W	Electrofishing	Smallmouth Bass	116	30
2004	August	14	W	Electrofishing	Smallmouth Bass	117	20
2004	August	14	W	Electrofishing	Smallmouth Bass	82	10
2004	August	14	W	Electrofishing	Smallmouth Bass	101	15
2004	August	14	W	Electrofishing	Smallmouth Bass	90	10
2004	August	14	W	Electrofishing	Smallmouth Bass	76	10
2004	August	14	W	Electrofishing	Smallmouth Bass	97	15
2004	August	14	E	Electrofishing	Smallmouth Bass	109	20
2004	August	14	E	Electrofishing	Smallmouth Bass	160	75
2004	August	14	E	Electrofishing	Smallmouth Bass	76	15
2004	August	13	W	Electrofishing	Smallmouth Bass	150	50
2004	August	13	W	Electrofishing	Smallmouth Bass	137	35
2004	August	13	W	Electrofishing	Smallmouth Bass	157	55
2004	August	13	W	Electrofishing	Smallmouth Bass	132	35
2004	August	13	W	Electrofishing	Smallmouth Bass	133	35
2004	August	13	W	Electrofishing	Smallmouth Bass	151	45
2004	August	13	W	Electrofishing	Smallmouth Bass	114	25
2004	August	13	E	Electrofishing	Smallmouth Bass	90	10
2004	August	12	E	Electrofishing	Smallmouth Bass	85	5
2004	August	11	E	Electrofishing	Smallmouth Bass	446	1200
2004	August	11	E	Electrofishing	Smallmouth Bass	79	5
2004	August	15	E	Electrofishing	Smallmouth Bass	106	18
2004	August	12	E	Electrofishing	Spottail Shiner	56	1
2004	August	12	E	Electrofishing	Spottail Shiner	52	1
2004	August	12	E	Electrofishing	Spottail Shiner	44	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	August	12	W	Electrofishing	Tessellated Darter	65	4
2004	August	12	W	Electrofishing	White Sucker	471	1150
2004	August	12	W	Electrofishing	White Sucker	523	1250
2004	August	12	W	Electrofishing	White Sucker	467	1200
2004	August	12	E	Electrofishing	White Sucker	171	50
2004	August	12	E	Electrofishing	Yellow Perch	195	100
2004	August	12	E	Electrofishing	Yellow Perch	161	55
2004	August	12	E	Electrofishing	Yellow Perch	227	160
2004	August	12	E	Electrofishing	Yellow Perch	186	70
2004	August	12	E	Electrofishing	Yellow Perch	105	15
2004	August	11	W	Electrofishing	Yellow Perch	95	14
2004	August	11	W	Electrofishing	Yellow Perch	95	15
2004	August	11	W	Electrofishing	Yellow Perch	105	18
2004	August	11	W	Electrofishing	Yellow Perch	107	18
2004	August	15	E	Electrofishing	Yellow Perch	217	140
2004	August	15	E	Electrofishing	Yellow Perch	164	75
2004	September	11	W	Electrofishing	Alewife	87	2
2004	September	12	E	Electrofishing	Alewife	102	12
2004	September	12	E	Electrofishing	Alewife	109	10
2004	September	12	E	Electrofishing	Alewife	95	7
2004	September	12	E	Electrofishing	Alewife	101	8
2004	September	12	E	Electrofishing	Alewife	104	8
2004	September	11	E	Electrofishing	American Eel	325	48
2004	September	12	W	Electrofishing	American Eel	720	700
2004	September	18		Electrofishing	American Eel	195	210
2004	September	14	E	Electrofishing	American Eel	552	320
2004	September	18		Electrofishing	Black Crappie	140	36
2004	September	11	E	Electrofishing	Bluegill	42	1
2004	September	12	W	Electrofishing	Bluegill	241	360
2004	September	12	W	Electrofishing	Bluegill	213	261
2004	September	12	W	Electrofishing	Bluegill	251	358
2004	September	12	E	Electrofishing	Bluegill	213	251
2004	September	12	E	Electrofishing	Bluegill	234	318
2004	September	12	E	Electrofishing	Bluegill	250	341
2004	September	12	E	Electrofishing	Bluegill	46	1
2004	September	12	E	Electrofishing	Bluegill	65	8
2004	September	12	E	Electrofishing	Bluegill	53	1
2004	September	12	E	Electrofishing	Bluegill	52	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	12	E	Electrofishing	Bluegill	42	1
2004	September	12	E	Electrofishing	Bluegill	46	1
2004	September	12	E	Electrofishing	Bluegill	42	1
2004	September	12	E	Electrofishing	Bluegill	44	1
2004	September	12	E	Electrofishing	Bluegill	39	1
2004	September	18		Electrofishing	Bluegill	212	270
2004	September	18		Electrofishing	Bluegill	190	178
2004	September	18		Electrofishing	Bluegill	93	12
2004	September	18		Electrofishing	Bluegill	106	25
2004	September	18		Electrofishing	Bluegill	158	98
2004	September	18		Electrofishing	Bluegill	87	14
2004	September	18		Electrofishing	Bluegill	141	59
2004	September	18		Electrofishing	Bluegill	94	18
2004	September	18		Electrofishing	Bluegill	87	15
2004	September	13	E	Electrofishing	Bluegill	38	1
2004	September	13	E	Electrofishing	Bluegill	77	6
2004	September	13	E	Electrofishing	Bluegill	72	5
2004	September	14	E	Electrofishing	Bluegill	235	355
2004	September	14	E	Electrofishing	Bluegill	77	9
2004	September	14	E	Electrofishing	Bluegill	74	5
2004	September	14	E	Electrofishing	Bluegill	49	2
2004	September	14	E	Electrofishing	Bluegill	40	1
2004	September	14	E	Electrofishing	Bluegill	49	2
2004	September	14	W	Electrofishing	Bluegill	119	30
2004	September	14	W	Electrofishing	Bluegill	118	29
2004	September	14	W	Electrofishing	Bluegill	101	21
2004	September	14	W	Electrofishing	Bluegill	104	20
2004	September	14	W	Electrofishing	Bluegill	97	18
2004	September	14	W	Electrofishing	Bluegill	75	9
2004	September	14	W	Electrofishing	Bluegill	84	11
2004	September	14	W	Electrofishing	Bluegill	81	9
2004	September	14	W	Electrofishing	Bluegill	76	6
2004	September	14	W	Electrofishing	Bluegill	88	10
2004	September	14	W	Electrofishing	Bluegill	63	4
2004	September	14	W	Electrofishing	Bluegill	53	2
2004	September	14	W	Electrofishing	Bluegill	54	2
2004	September	14	W	Electrofishing	Bluegill	83	11
2004	September	14	W	Electrofishing	Bluegill	55	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	14	W	Electrofishing	Bluegill	43	2
2004	September	14	W	Electrofishing	Bluegill	55	2
2004	September	14	W	Electrofishing	Bluegill	48	1
2004	September	15	E	Electrofishing	Bluegill	115	22
2004	September	15	E	Electrofishing	Bluegill	46	1
2004	September	11	W	Electrofishing	Chain Pickerel	220	60
2004	September	11	E	Electrofishing	Fallfish	124	21
2004	September	11	E	Electrofishing	Fallfish	138	30
2004	September	11	E	Electrofishing	Fallfish	125	18
2004	September	12	E	Electrofishing	Fallfish	141	38
2004	September	13	E	Electrofishing	Fallfish	241	136
2004	September	11	W	Electrofishing	Golden Shiner	125	18
2004	September	11	W	Electrofishing	Golden Shiner	93	6
2004	September	11	E	Electrofishing	Golden Shiner	119	21
2004	September	11	E	Electrofishing	Golden Shiner	115	6
2004	September	11	E	Electrofishing	Golden Shiner	99	8
2004	September	11	E	Electrofishing	Golden Shiner	115	16
2004	September	11	E	Electrofishing	Golden Shiner	109	13
2004	September	11	E	Electrofishing	Golden Shiner	112	18
2004	September	11	E	Electrofishing	Golden Shiner	121	12
2004	September	11	E	Electrofishing	Golden Shiner	118	14
2004	September	12	E	Electrofishing	Golden Shiner	106	12
2004	September	12	E	Electrofishing	Golden Shiner	111	14
2004	September	12	E	Electrofishing	Golden Shiner	105	13
2004	September	12	E	Electrofishing	Golden Shiner	104	12
2004	September	12	E	Electrofishing	Golden Shiner	88	8
2004	September	12	E	Electrofishing	Golden Shiner	112	18
2004	September	12	E	Electrofishing	Golden Shiner	90	6
2004	September	12	E	Electrofishing	Golden Shiner	96	10
2004	September	12	E	Electrofishing	Golden Shiner	111	10
2004	September	11	W	Electrofishing	Largemouth Bass	498	1900
2004	September	11	W	Electrofishing	Largemouth Bass	462	1250
2004	September	12	W	Electrofishing	Largemouth Bass	95	12
2004	September	12	W	Electrofishing	Largemouth Bass	92	10
2004	September	12	W	Electrofishing	Largemouth Bass	69	8
2004	September	12	W	Electrofishing	Largemouth Bass	67	7
2004	September	12	W	Electrofishing	Largemouth Bass	52	4
2004	September	12	E	Electrofishing	Largemouth Bass	132	31

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	12	E	Electrofishing	Largemouth Bass	92	12
2004	September	12	E	Electrofishing	Largemouth Bass	179	82
2004	September	12	E	Electrofishing	Largemouth Bass	133	31
2004	September	12	E	Electrofishing	Largemouth Bass	123	31
2004	September	12	E	Electrofishing	Largemouth Bass	75	6
2004	September	12	E	Electrofishing	Largemouth Bass	62	8
2004	September	12	E	Electrofishing	Largemouth Bass	82	7
2004	September	12	E	Electrofishing	Largemouth Bass	65	5
2004	September	12	E	Electrofishing	Largemouth Bass	52	3
2004	September	12	E	Electrofishing	Largemouth Bass	51	2
2004	September	12	E	Electrofishing	Largemouth Bass	75	7
2004	September	12	E	Electrofishing	Largemouth Bass	69	5
2004	September	18		Electrofishing	Largemouth Bass	303	378
2004	September	18		Electrofishing	Largemouth Bass	320	501
2004	September	18		Electrofishing	Largemouth Bass	390	784
2004	September	18		Electrofishing	Largemouth Bass	147	35
2004	September	18		Electrofishing	Largemouth Bass	180	70
2004	September	18		Electrofishing	Largemouth Bass	116	16
2004	September	18		Electrofishing	Largemouth Bass	155	45
2004	September	18		Electrofishing	Largemouth Bass	147	39
2004	September	18		Electrofishing	Largemouth Bass	110	13
2004	September	18		Electrofishing	Largemouth Bass	143	38
2004	September	18		Electrofishing	Largemouth Bass	170	70
2004	September	18		Electrofishing	Largemouth Bass	115	17
2004	September	18		Electrofishing	Largemouth Bass	166	60
2004	September	18		Electrofishing	Largemouth Bass	150	46
2004	September	18		Electrofishing	Largemouth Bass	140	37
2004	September	18		Electrofishing	Largemouth Bass	132	32
2004	September	18		Electrofishing	Largemouth Bass	115	21
2004	September	18		Electrofishing	Largemouth Bass	116	20
2004	September	18		Electrofishing	Largemouth Bass	116	13
2004	September	13	W	Electrofishing	Largemouth Bass	136	35
2004	September	13	W	Electrofishing	Largemouth Bass	121	23
2004	September	13	W	Electrofishing	Largemouth Bass	136	30
2004	September	13	W	Electrofishing	Largemouth Bass	155	42
2004	September	13	W	Electrofishing	Largemouth Bass	158	54
2004	September	13	W	Electrofishing	Largemouth Bass	139	25
2004	September	13	W	Electrofishing	Largemouth Bass	115	16

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	13	W	Electrofishing	Largemouth Bass	111	12
2004	September	13	W	Electrofishing	Largemouth Bass	125	20
2004	September	13	E	Electrofishing	Largemouth Bass	90	8
2004	September	13	E	Electrofishing	Largemouth Bass	183	62
2004	September	13	E	Electrofishing	Largemouth Bass	180	68
2004	September	13	E	Electrofishing	Largemouth Bass	181	54
2004	September	13	E	Electrofishing	Largemouth Bass	77	6
2004	September	13	E	Electrofishing	Largemouth Bass	72	4
2004	September	13	E	Electrofishing	Largemouth Bass	145	28
2004	September	13	E	Electrofishing	Largemouth Bass	141	29
2004	September	13	E	Electrofishing	Largemouth Bass	75	5
2004	September	13	E	Electrofishing	Largemouth Bass	72	4
2004	September	13	E	Electrofishing	Largemouth Bass	81	6
2004	September	13	E	Electrofishing	Largemouth Bass	65	3
2004	September	14	E	Electrofishing	Largemouth Bass	569	2800
2004	September	14	E	Electrofishing	Largemouth Bass	92	10
2004	September	14	E	Electrofishing	Largemouth Bass	104	13
2004	September	14	E	Electrofishing	Largemouth Bass	82	4
2004	September	14	E	Electrofishing	Largemouth Bass	110	12
2004	September	14	E	Electrofishing	Largemouth Bass	93	7
2004	September	14	E	Electrofishing	Largemouth Bass	96	7
2004	September	14	E	Electrofishing	Largemouth Bass	75	4
2004	September	14	E	Electrofishing	Largemouth Bass	70	3
2004	September	14	E	Electrofishing	Largemouth Bass	90	8
2004	September	14	W	Electrofishing	Largemouth Bass	79	6
2004	September	14	W	Electrofishing	Largemouth Bass	90	10
2004	September	14	W	Electrofishing	Largemouth Bass	76	6
2004	September	14	W	Electrofishing	Largemouth Bass	71	4
2004	September	14	W	Electrofishing	Largemouth Bass	76	5
2004	September	14	W	Electrofishing	Largemouth Bass	77	5
2004	September	14	W	Electrofishing	Largemouth Bass	68	3
2004	September	14	W	Electrofishing	Largemouth Bass	72	5
2004	September	14	W	Electrofishing	Largemouth Bass	80	6
2004	September	14	W	Electrofishing	Largemouth Bass	72	4
2004	September	14	W	Electrofishing	Largemouth Bass	69	3
2004	September	14	W	Electrofishing	Largemouth Bass	60	2
2004	September	14	W	Electrofishing	Largemouth Bass	69	4
2004	September	14	W	Electrofishing	Largemouth Bass	60	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	14	W	Electrofishing	Largemouth Bass	132	42
2004	September	15	E	Electrofishing	Largemouth Bass	150	45
2004	September	15	E	Electrofishing	Largemouth Bass	81	7
2004	September	15	E	Electrofishing	Largemouth Bass	199	110
2004	September	15	E	Electrofishing	Largemouth Bass	71	4
2004	September	15	E	Electrofishing	Largemouth Bass	73	4
2004	September	15	E	Electrofishing	Largemouth Bass	90	7
2004	September	15	E	Electrofishing	Largemouth Bass	75	4
2004	September	15	E	Electrofishing	Largemouth Bass	91	9
2004	September	15	E	Electrofishing	Largemouth Bass	81	6
2004	September	15	E	Electrofishing	Largemouth Bass	72	4
2004	September	15	E	Electrofishing	Largemouth Bass	86	6
2004	September	15	E	Electrofishing	Largemouth Bass	77	5
2004	September	15	E	Electrofishing	Largemouth Bass	75	4
2004	September	15	E	Electrofishing	Largemouth Bass	76	5
2004	September	15	E	Electrofishing	Largemouth Bass	69	3
2004	September	15	E	Electrofishing	Largemouth Bass	64	3
2004	September	15	E	Electrofishing	Largemouth Bass	66	3
2004	September	12	E	Electrofishing	Pumpkinseed	105	13
2004	September	18		Electrofishing	Pumpkinseed	90	10
2004	September	14	E	Electrofishing	Pumpkinseed	171	175
2004	September	14	W	Electrofishing	Pumpkinseed	98	22
2004	September	11	E	Electrofishing	Redbreast Sunfish	66	4
2004	September	11	E	Electrofishing	Redbreast Sunfish	65	4
2004	September	12	W	Electrofishing	Redbreast Sunfish	49	1
2004	September	12	W	Electrofishing	Redbreast Sunfish	142	55
2004	September	14	E	Electrofishing	Redbreast Sunfish	144	55
2004	September	11	E	Electrofishing	Rock Bass	229	286
2004	September	11	E	Electrofishing	Rock Bass	53	3
2004	September	18		Electrofishing	Rock Bass	148	67
2004	September	11	W	Electrofishing	Smallmouth Bass	334	504
2004	September	11	W	Electrofishing	Smallmouth Bass	144	38
2004	September	11	W	Electrofishing	Smallmouth Bass	44	1
2004	September	11	W	Electrofishing	Smallmouth Bass	48	1
2004	September	11	E	Electrofishing	Smallmouth Bass	74	3
2004	September	11	E	Electrofishing	Smallmouth Bass	78	5
2004	September	11	E	Electrofishing	Smallmouth Bass	66	3
2004	September	11	E	Electrofishing	Smallmouth Bass	63	4

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	12	W	Electrofishing	Smallmouth Bass	61	6
2004	September	12	W	Electrofishing	Smallmouth Bass	158	62
2004	September	12	W	Electrofishing	Smallmouth Bass	89	13
2004	September	12	W	Electrofishing	Smallmouth Bass	62	6
2004	September	12	W	Electrofishing	Smallmouth Bass	81	11
2004	September	12	W	Electrofishing	Smallmouth Bass	70	8
2004	September	12	W	Electrofishing	Smallmouth Bass	87	10
2004	September	12	W	Electrofishing	Smallmouth Bass	80	8
2004	September	12	W	Electrofishing	Smallmouth Bass	70	5
2004	September	12	W	Electrofishing	Smallmouth Bass	124	18
2004	September	12	W	Electrofishing	Smallmouth Bass	82	7
2004	September	12	W	Electrofishing	Smallmouth Bass	71	5
2004	September	12	W	Electrofishing	Smallmouth Bass	80	6
2004	September	12	W	Electrofishing	Smallmouth Bass	155	49
2004	September	12	W	Electrofishing	Smallmouth Bass	82	7
2004	September	12	W	Electrofishing	Smallmouth Bass	79	8
2004	September	12	W	Electrofishing	Smallmouth Bass	125	16
2004	September	12	W	Electrofishing	Smallmouth Bass	71	8
2004	September	12	W	Electrofishing	Smallmouth Bass	122	18
2004	September	12	W	Electrofishing	Smallmouth Bass	75	5
2004	September	12	W	Electrofishing	Smallmouth Bass	72	5
2004	September	12	W	Electrofishing	Smallmouth Bass	85	10
2004	September	12	W	Electrofishing	Smallmouth Bass	76	9
2004	September	12	W	Electrofishing	Smallmouth Bass	66	8
2004	September	12	W	Electrofishing	Smallmouth Bass	95	12
2004	September	12	W	Electrofishing	Smallmouth Bass	80	10
2004	September	12	E	Electrofishing	Smallmouth Bass	102	16
2004	September	12	E	Electrofishing	Smallmouth Bass	145	51
2004	September	12	E	Electrofishing	Smallmouth Bass	136	42
2004	September	12	E	Electrofishing	Smallmouth Bass	140	49
2004	September	12	E	Electrofishing	Smallmouth Bass	168	58
2004	September	12	E	Electrofishing	Smallmouth Bass	136	32
2004	September	12	E	Electrofishing	Smallmouth Bass	89	14
2004	September	12	E	Electrofishing	Smallmouth Bass	137	35
2004	September	12	E	Electrofishing	Smallmouth Bass	91	12
2004	September	12	E	Electrofishing	Smallmouth Bass	72	8
2004	September	12	E	Electrofishing	Smallmouth Bass	145	48
2004	September	12	E	Electrofishing	Smallmouth Bass	125	31

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	12	E	Electrofishing	Smallmouth Bass	126	62
2004	September	12	E	Electrofishing	Smallmouth Bass	161	54
2004	September	12	E	Electrofishing	Smallmouth Bass	52	1
2004	September	12	E	Electrofishing	Smallmouth Bass	168	71
2004	September	12	E	Electrofishing	Smallmouth Bass	72	6
2004	September	12	E	Electrofishing	Smallmouth Bass	77	8
2004	September	12	E	Electrofishing	Smallmouth Bass	65	2
2004	September	12	E	Electrofishing	Smallmouth Bass	72	6
2004	September	12	E	Electrofishing	Smallmouth Bass	109	22
2004	September	12	E	Electrofishing	Smallmouth Bass	81	11
2004	September	12	E	Electrofishing	Smallmouth Bass	90	12
2004	September	12	E	Electrofishing	Smallmouth Bass	65	5
2004	September	12	E	Electrofishing	Smallmouth Bass	58	2
2004	September	12	E	Electrofishing	Smallmouth Bass	69	4
2004	September	12	E	Electrofishing	Smallmouth Bass	96	12
2004	September	12	E	Electrofishing	Smallmouth Bass	89	8
2004	September	12	E	Electrofishing	Smallmouth Bass	85	9
2004	September	12	E	Electrofishing	Smallmouth Bass	65	4
2004	September	12	E	Electrofishing	Smallmouth Bass	70	7
2004	September	12	E	Electrofishing	Smallmouth Bass	72	7
2004	September	18		Electrofishing	Smallmouth Bass	91	8
2004	September	18		Electrofishing	Smallmouth Bass	102	9
2004	September	18		Electrofishing	Smallmouth Bass	99	8
2004	September	18		Electrofishing	Smallmouth Bass	94	7
2004	September	18		Electrofishing	Smallmouth Bass	120	22
2004	September	18		Electrofishing	Smallmouth Bass	99	12
2004	September	18		Electrofishing	Smallmouth Bass	117	18
2004	September	18		Electrofishing	Smallmouth Bass	95	10
2004	September	18		Electrofishing	Smallmouth Bass	112	20
2004	September	18		Electrofishing	Smallmouth Bass	105	16
2004	September	18		Electrofishing	Smallmouth Bass	98	11
2004	September	18		Electrofishing	Smallmouth Bass	103	13
2004	September	13	W	Electrofishing	Smallmouth Bass	190	80
2004	September	13	W	Electrofishing	Smallmouth Bass	140	40
2004	September	13	W	Electrofishing	Smallmouth Bass	107	20
2004	September	13	W	Electrofishing	Smallmouth Bass	125	22
2004	September	13	W	Electrofishing	Smallmouth Bass	132	31
2004	September	13	W	Electrofishing	Smallmouth Bass	121	25

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	13	W	Electrofishing	Smallmouth Bass	151	50
2004	September	13	W	Electrofishing	Smallmouth Bass	112	16
2004	September	13	W	Electrofishing	Smallmouth Bass	124	15
2004	September	13	W	Electrofishing	Smallmouth Bass	93	10
2004	September	13	W	Electrofishing	Smallmouth Bass	155	50
2004	September	13	W	Electrofishing	Smallmouth Bass	99	9
2004	September	14	E	Electrofishing	Smallmouth Bass	130	29
2004	September	14	E	Electrofishing	Smallmouth Bass	173	65
2004	September	14	E	Electrofishing	Smallmouth Bass	99	8
2004	September	14	W	Electrofishing	Smallmouth Bass	75	7
2004	September	14	W	Electrofishing	Smallmouth Bass	99	14
2004	September	11	W	Electrofishing	Spottail Shiner	95	
2004	September	11	W	Electrofishing	Spottail Shiner	55	
2004	September	11	W	Electrofishing	Spottail Shiner	96	10
2004	September	11	W	Electrofishing	Spottail Shiner	57	
2004	September	11	W	Electrofishing	Spottail Shiner	57	1
2004	September	11	W	Electrofishing	Spottail Shiner	52	1
2004	September	11	W	Electrofishing	Spottail Shiner	53	
2004	September	11	W	Electrofishing	Spottail Shiner	56	
2004	September	11	W	Electrofishing	Spottail Shiner	54	
2004	September	11	W	Electrofishing	Spottail Shiner	56	1
2004	September	11	W	Electrofishing	Spottail Shiner	59	1
2004	September	11	W	Electrofishing	Spottail Shiner	62	
2004	September	11	W	Electrofishing	Spottail Shiner	52	
2004	September	11	W	Electrofishing	Spottail Shiner	57	
2004	September	11	W	Electrofishing	Spottail Shiner	54	
2004	September	11	W	Electrofishing	Spottail Shiner	65	
2004	September	11	W	Electrofishing	Spottail Shiner	58	
2004	September	11	W	Electrofishing	Spottail Shiner	54	
2004	September	11	W	Electrofishing	Spottail Shiner	62	
2004	September	11	W	Electrofishing	Spottail Shiner	63	
2004	September	11	W	Electrofishing	Spottail Shiner	70	
2004	September	11	W	Electrofishing	Spottail Shiner	96	
2004	September	11	W	Electrofishing	Spottail Shiner	56	
2004	September	11	W	Electrofishing	Spottail Shiner	61	
2004	September	11	W	Electrofishing	Spottail Shiner	59	
2004	September	11	W	Electrofishing	Spottail Shiner	56	
2004	September	11	W	Electrofishing	Spottail Shiner	52	

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	11	W	Electrofishing	Spottail Shiner	56	
2004	September	11	W	Electrofishing	Spottail Shiner	55	
2004	September	11	W	Electrofishing	Spottail Shiner	54	
2004	September	11	W	Electrofishing	Spottail Shiner	62	
2004	September	11	W	Electrofishing	Spottail Shiner	49	
2004	September	11	W	Electrofishing	Spottail Shiner	55	
2004	September	11	W	Electrofishing	Spottail Shiner	56	
2004	September	11	W	Electrofishing	Spottail Shiner	53	
2004	September	11	W	Electrofishing	Spottail Shiner	54	
2004	September	11	W	Electrofishing	Spottail Shiner	56	
2004	September	11	W	Electrofishing	Spottail Shiner	45	
2004	September	11	W	Electrofishing	Spottail Shiner	61	
2004	September	11	W	Electrofishing	Spottail Shiner	61	
2004	September	11	W	Electrofishing	Spottail Shiner	54	
2004	September	11	W	Electrofishing	Spottail Shiner	54	
2004	September	11	W	Electrofishing	Spottail Shiner	63	
2004	September	11	W	Electrofishing	Spottail Shiner	57	
2004	September	11	W	Electrofishing	Spottail Shiner	52	
2004	September	11	W	Electrofishing	Spottail Shiner	54	
2004	September	11	W	Electrofishing	Spottail Shiner	53	
2004	September	11	W	Electrofishing	Spottail Shiner	55	
2004	September	11	W	Electrofishing	Spottail Shiner	57	
2004	September	11	W	Electrofishing	Spottail Shiner	56	
2004	September	11	W	Electrofishing	Spottail Shiner	56	
2004	September	11	W	Electrofishing	Spottail Shiner	58	
2004	September	11	W	Electrofishing	Spottail Shiner	49	90
2004	September	11	W	Electrofishing	Spottail Shiner		
2004	September	11	E	Electrofishing	Spottail Shiner	97	8
2004	September	11	E	Electrofishing	Spottail Shiner	99	8
2004	September	11	E	Electrofishing	Spottail Shiner	122	18
2004	September	11	E	Electrofishing	Spottail Shiner	101	9
2004	September	11	E	Electrofishing	Spottail Shiner	109	12
2004	September	11	E	Electrofishing	Spottail Shiner	92	7
2004	September	11	E	Electrofishing	Spottail Shiner	105	9
2004	September	11	E	Electrofishing	Spottail Shiner	103	10
2004	September	11	E	Electrofishing	Spottail Shiner	122	17
2004	September	11	E	Electrofishing	Spottail Shiner	100	8
2004	September	11	E	Electrofishing	Spottail Shiner	105	10

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	11	E	Electrofishing	Spottail Shiner	101	9
2004	September	11	E	Electrofishing	Spottail Shiner	97	9
2004	September	11	E	Electrofishing	Spottail Shiner	95	7
2004	September	11	E	Electrofishing	Spottail Shiner	100	8
2004	September	11	E	Electrofishing	Spottail Shiner	95	
2004	September	11	E	Electrofishing	Spottail Shiner	102	
2004	September	11	E	Electrofishing	Spottail Shiner	96	
2004	September	11	E	Electrofishing	Spottail Shiner	99	
2004	September	11	E	Electrofishing	Spottail Shiner	118	
2004	September	11	E	Electrofishing	Spottail Shiner	101	
2004	September	11	E	Electrofishing	Spottail Shiner	95	
2004	September	11	E	Electrofishing	Spottail Shiner	108	
2004	September	11	E	Electrofishing	Spottail Shiner	110	
2004	September	11	E	Electrofishing	Spottail Shiner	102	
2004	September	11	E	Electrofishing	Spottail Shiner	112	
2004	September	11	E	Electrofishing	Spottail Shiner	98	
2004	September	11	E	Electrofishing	Spottail Shiner	99	
2004	September	11	E	Electrofishing	Spottail Shiner	119	
2004	September	11	E	Electrofishing	Spottail Shiner	98	
2004	September	11	E	Electrofishing	Spottail Shiner	102	
2004	September	11	E	Electrofishing	Spottail Shiner	107	
2004	September	11	E	Electrofishing	Spottail Shiner	105	
2004	September	11	E	Electrofishing	Spottail Shiner	103	
2004	September	11	E	Electrofishing	Spottail Shiner	109	
2004	September	11	E	Electrofishing	Spottail Shiner	100	
2004	September	11	E	Electrofishing	Spottail Shiner	115	
2004	September	11	E	Electrofishing	Spottail Shiner	109	
2004	September	11	E	Electrofishing	Spottail Shiner	102	
2004	September	11	E	Electrofishing	Spottail Shiner	105	
2004	September	11	E	Electrofishing	Spottail Shiner	103	
2004	September	11	E	Electrofishing	Spottail Shiner	104	
2004	September	11	E	Electrofishing	Spottail Shiner	108	
2004	September	11	E	Electrofishing	Spottail Shiner	106	
2004	September	11	E	Electrofishing	Spottail Shiner	101	
2004	September	11	E	Electrofishing	Spottail Shiner	118	
2004	September	11	E	Electrofishing	Spottail Shiner	104	
2004	September	11	E	Electrofishing	Spottail Shiner	100	
2004	September	11	E	Electrofishing	Spottail Shiner	102	

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	September	11	E	Electrofishing	Spottail Shiner	100	372
2004	September	11	E	Electrofishing	Spottail Shiner		
2004	September	12	E	Electrofishing	Spottail Shiner	84	2
2004	September	12	E	Electrofishing	Spottail Shiner	90	5
2004	September	12	E	Electrofishing	Spottail Shiner	110	8
2004	September	12	E	Electrofishing	Spottail Shiner	71	2
2004	September	12	E	Electrofishing	Spottail Shiner	92	5
2004	September	12	W	Electrofishing	Tessellated Darter	68	3
2004	September	12	E	Electrofishing	Tessellated Darter	57	1
2004	September	13	W	Electrofishing	Tessellated Darter	65	2
2004	September	11	W	Electrofishing	White Sucker	193	84
2004	September	11	E	Electrofishing	White Sucker	212	104
2004	September	11	E	Electrofishing	White Sucker	231	158
2004	September	11	E	Electrofishing	White Sucker	193	88
2004	September	11	E	Electrofishing	White Sucker	128	22
2004	September	12	E	Electrofishing	White Sucker	191	82
2004	September	12	E	Electrofishing	White Sucker	185	82
2004	September	12	E	Electrofishing	White Sucker	180	81
2004	September	12	E	Electrofishing	White Sucker	85	10
2004	September	12	E	Electrofishing	White Sucker	139	35
2004	September	15	E	Electrofishing	White Sucker	292	255
2004	September	11	W	Electrofishing	Yellow Perch	160	54
2004	September	12	W	Electrofishing	Yellow Perch	117	16
2004	October	15	W	Electrofishing	Alewife	88	8
2004	October	13	W	Electrofishing	American Eel	590	335
2004	October	18		Electrofishing	Black Crappie	155	64
2004	October	12	E	Electrofishing	Bluegill	52	4
2004	October	12	E	Electrofishing	Bluegill	49	4
2004	October	12	E	Electrofishing	Bluegill	43	2
2004	October	12	E	Electrofishing	Bluegill	72	10
2004	October	12	E	Electrofishing	Bluegill	43	3
2004	October	12	E	Electrofishing	Bluegill	49	4
2004	October	12	E	Electrofishing	Bluegill	38	2
2004	October	12	E	Electrofishing	Bluegill	31	1
2004	October	18		Electrofishing	Bluegill	125	50
2004	October	18		Electrofishing	Bluegill	146	70
2004	October	18		Electrofishing	Bluegill	194	150
2004	October	18		Electrofishing	Bluegill	165	110

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	October	18		Electrofishing	Bluegill	177	140
2004	October	18		Electrofishing	Bluegill	128	50
2004	October	18		Electrofishing	Bluegill	236	370
2004	October	18		Electrofishing	Bluegill	112	38
2004	October	18		Electrofishing	Bluegill	117	40
2004	October	18		Electrofishing	Bluegill	83	15
2004	October	18		Electrofishing	Bluegill	106	30
2004	October	18		Electrofishing	Bluegill	147	78
2004	October	12	E	Electrofishing	Chain Pickerel	211	50
2004	October	12	E	Electrofishing	Common Shiner	109	30
2004	October	12	E	Electrofishing	Common Shiner	98	25
2004	October	12	E	Electrofishing	Common Shiner	127	36
2004	October	12	E	Electrofishing	Golden Shiner	128	40
2004	October	12	E	Electrofishing	Golden Shiner	106	30
2004	October	12	E	Electrofishing	Golden Shiner	121	35
2004	October	12	E	Electrofishing	Golden Shiner	129	32
2004	October	12	E	Electrofishing	Golden Shiner	95	20
2004	October	11	W	Electrofishing	Largemouth Bass	50	4
2004	October	12	E	Electrofishing	Largemouth Bass	87	12
2004	October	12	E	Electrofishing	Largemouth Bass	97	18
2004	October	12	E	Electrofishing	Largemouth Bass	145	55
2004	October	12	E	Electrofishing	Largemouth Bass	74	11
2004	October	12	E	Electrofishing	Largemouth Bass	141	48
2004	October	12	E	Electrofishing	Largemouth Bass	93	21
2004	October	12	E	Electrofishing	Largemouth Bass	146	52
2004	October	12	E	Electrofishing	Largemouth Bass	115	30
2004	October	12	E	Electrofishing	Largemouth Bass	137	48
2004	October	12	E	Electrofishing	Largemouth Bass	67	6
2004	October	12	E	Electrofishing	Largemouth Bass	109	30
2004	October	12	E	Electrofishing	Largemouth Bass	75	12
2004	October	12	E	Electrofishing	Largemouth Bass	176	90
2004	October	12	E	Electrofishing	Largemouth Bass	76	12
2004	October	12	E	Electrofishing	Largemouth Bass	58	5
2004	October	12	E	Electrofishing	Largemouth Bass	74	11
2004	October	12	E	Electrofishing	Largemouth Bass	65	8
2004	October	12	E	Electrofishing	Largemouth Bass	69	10
2004	October	12	E	Electrofishing	Largemouth Bass	77	12
2004	October	12	E	Electrofishing	Largemouth Bass	101	20

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	October	12	E	Electrofishing	Largemouth Bass	81	13
2004	October	12	E	Electrofishing	Largemouth Bass	63	8
2004	October	12	E	Electrofishing	Largemouth Bass	78	12
2004	October	12	E	Electrofishing	Largemouth Bass	62	8
2004	October	12	E	Electrofishing	Largemouth Bass	72	12
2004	October	12	E	Electrofishing	Largemouth Bass	73	13
2004	October	12	E	Electrofishing	Largemouth Bass	65	7
2004	October	12	E	Electrofishing	Largemouth Bass	64	6
2004	October	12	E	Electrofishing	Largemouth Bass	68	8
2004	October	12	E	Electrofishing	Largemouth Bass	74	12
2004	October	12	E	Electrofishing	Largemouth Bass	59	6
2004	October	12	E	Electrofishing	Largemouth Bass	77	10
2004	October	12	E	Electrofishing	Largemouth Bass	68	8
2004	October	12	E	Electrofishing	Largemouth Bass	49	4
2004	October	12	E	Electrofishing	Largemouth Bass	53	4
2004	October	12	E	Electrofishing	Largemouth Bass	54	4
2004	October	12	E	Electrofishing	Largemouth Bass	61	5
2004	October	12	E	Electrofishing	Largemouth Bass	54	4
2004	October	12	E	Electrofishing	Largemouth Bass	86	9
2004	October	12	E	Electrofishing	Largemouth Bass	55	4
2004	October	18		Electrofishing	Largemouth Bass	468	1800
2004	October	18		Electrofishing	Largemouth Bass	368	850
2004	October	18		Electrofishing	Largemouth Bass	409	1200
2004	October	18		Electrofishing	Largemouth Bass	408	950
2004	October	18		Electrofishing	Largemouth Bass	167	55
2004	October	18		Electrofishing	Largemouth Bass	178	75
2004	October	18		Electrofishing	Largemouth Bass	176	72
2004	October	18		Electrofishing	Largemouth Bass	134	38
2004	October	18		Electrofishing	Largemouth Bass	184	80
2004	October	18		Electrofishing	Largemouth Bass	171	60
2004	October	18		Electrofishing	Largemouth Bass	197	98
2004	October	18		Electrofishing	Largemouth Bass	205	114
2004	October	18		Electrofishing	Largemouth Bass	283	300
2004	October	18		Electrofishing	Largemouth Bass	205	130
2004	October	18		Electrofishing	Largemouth Bass	141	40
2004	October	18		Electrofishing	Largemouth Bass	132	35
2004	October	18		Electrofishing	Largemouth Bass	164	62
2004	October	13	W	Electrofishing	Largemouth Bass	80	7

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	October	14	W	Electrofishing	Largemouth Bass	140	33
2004	October	14	W	Electrofishing	Largemouth Bass	38	6
2004	October	14	W	Electrofishing	Largemouth Bass	157	62
2004	October	14	W	Electrofishing	Largemouth Bass	37	6
2004	October	14	E	Electrofishing	Largemouth Bass	368	818
2004	October	14	E	Electrofishing	Largemouth Bass	358	690
2004	October	12	W	Electrofishing	Pumpkinseed	80	5
2004	October	18		Electrofishing	Pumpkinseed	82	16
2004	October	18		Electrofishing	Redbreast Sunfish	160	100
2004	October	12	E	Electrofishing	Rock Bass	58	10
2004	October	18		Electrofishing	Rock Bass	210	232
2004	October	18		Electrofishing	Rock Bass	161	86
2004	October	12	W	Electrofishing	Smallmouth Bass	275	240
2004	October	13	E	Electrofishing	Smallmouth Bass	112	18
2004	October	14	E	Electrofishing	Smallmouth Bass	170	72
2004	October	12	E	Electrofishing	Spottail Shiner	102	20
2004	October	12	E	Electrofishing	Spottail Shiner	90	10
2004	October	12	E	Electrofishing	Spottail Shiner	109	15
2004	October	12	E	Electrofishing	Spottail Shiner	105	18
2004	October	11	W	Electrofishing	Tessellated Darter	53	2
2004	October	11	E	Electrofishing	White Sucker	510	1450
2004	October	12	E	Electrofishing	White Sucker	185	85
2004	October	12	E	Electrofishing	White Sucker	126	30
2004	October	12	E	Electrofishing	White Sucker	198	100
2004	October	12	E	Electrofishing	White Sucker	157	60
2004	October	12	E	Electrofishing	White Sucker	113	30
2004	October	12	E	Electrofishing	White Sucker	140	52
2004	October	14	W	Electrofishing	White Sucker	499	1450
2004	December	18		Electrofishing	American Eel	468	155
2004	December	18		Electrofishing	American Eel	410	83
2004	December	17		Electrofishing	Atlantic Salmon	560	1600
2004	December	18		Electrofishing	Bluegill	98	18
2004	December	18		Electrofishing	Bluegill	112	20
2004	December	18		Electrofishing	Bluegill	57	3
2004	December	18		Electrofishing	Bluegill	65	4
2004	December	18		Electrofishing	Bluegill	80	5
2004	December	18		Electrofishing	Bluegill	64	4
2004	December	17		Electrofishing	Bluegill	161	84

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	December	17		Electrofishing	Bluegill	160	72
2004	December	17		Electrofishing	Bluegill	119	31
2004	December	17		Electrofishing	Bluegill	123	37
2004	December	17		Electrofishing	Bluegill	120	31
2004	December	16		Electrofishing	Bluegill	92	12
2004	December	16		Electrofishing	Bluegill	118	32
2004	December	14	W	Electrofishing	Bluegill	30	1
2004	December	14	W	Electrofishing	Bluegill	30	1
2004	December	14	W	Electrofishing	Bluegill	38	1
2004	December	14	W	Electrofishing	Bluegill	38	1
2004	December	16		Electrofishing	Chain Pickerel	386	332
2004	December	14	W	Electrofishing	Golden Shiner	109	5
2004	December	14	W	Electrofishing	Golden Shiner	75	2
2004	December	14	W	Electrofishing	Golden Shiner	90	2
2004	December	14	W	Electrofishing	Golden Shiner	72	2
2004	December	15	W	Electrofishing	Golden Shiner	70	1
2004	December	18		Electrofishing	Largemouth Bass	127	22
2004	December	18		Electrofishing	Largemouth Bass	155	33
2004	December	18		Electrofishing	Largemouth Bass	148	34
2004	December	18		Electrofishing	Largemouth Bass	112	18
2004	December	18		Electrofishing	Largemouth Bass	99	11
2004	December	18		Electrofishing	Largemouth Bass	100	11
2004	December	18		Electrofishing	Largemouth Bass	109	15
2004	December	18		Electrofishing	Largemouth Bass	112	18
2004	December	18		Electrofishing	Largemouth Bass	76	8
2004	December	16		Electrofishing	Largemouth Bass	210	118
2004	December	16		Electrofishing	Largemouth Bass	234	151
2004	December	16		Electrofishing	Largemouth Bass	224	129
2004	December	16		Electrofishing	Largemouth Bass	194	101
2004	December	16		Electrofishing	Largemouth Bass	199	103
2004	December	16		Electrofishing	Largemouth Bass	182	74
2004	December	16		Electrofishing	Largemouth Bass	183	72
2004	December	16		Electrofishing	Largemouth Bass	153	40
2004	December	16		Electrofishing	Largemouth Bass	144	39
2004	December	16		Electrofishing	Largemouth Bass	102	13
2004	December	16		Electrofishing	Largemouth Bass	132	23
2004	December	16		Electrofishing	Largemouth Bass	140	29
2004	December	16		Electrofishing	Largemouth Bass	68	6

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	December	13	W	Electrofishing	Largemouth Bass	74	3
2004	December	13	W	Electrofishing	Largemouth Bass	102	6
2004	December	13	W	Electrofishing	Largemouth Bass	79	4
2004	December	14	W	Electrofishing	Largemouth Bass	69	3
2004	December	14	W	Electrofishing	Largemouth Bass	53	2
2004	December	12	E	Electrofishing	Margined Madtom	42	1
2004	December	13	W	Electrofishing	Margined Madtom	41	2
2004	December	14	W	Electrofishing	Margined Madtom	46	1
2004	December	18		Electrofishing	Pumpkinseed	66	3
2004	December	12	W	Electrofishing	Smallmouth Bass	81	12
2004	December	16		Electrofishing	Smallmouth Bass	311	404
2004	December	16		Electrofishing	Smallmouth Bass	256	200
2004	December	16		Electrofishing	Smallmouth Bass	260	194
2004	December	16		Electrofishing	Smallmouth Bass	155	46
2004	December	16		Electrofishing	Smallmouth Bass	132	28
2004	December	16		Electrofishing	Smallmouth Bass	172	54
2004	December	16		Electrofishing	Smallmouth Bass	158	44
2004	December	16		Electrofishing	Smallmouth Bass	159	47
2004	December	16		Electrofishing	Smallmouth Bass	132	28
2004	December	16		Electrofishing	Smallmouth Bass	161	49
2004	December	16		Electrofishing	Smallmouth Bass	145	40
2004	December	16		Electrofishing	Smallmouth Bass	118	23
2004	December	16		Electrofishing	Smallmouth Bass	126	25
2004	December	16		Electrofishing	Smallmouth Bass	123	18
2004	December	13	W	Electrofishing	Smallmouth Bass	85	5
2004	December	13	W	Electrofishing	Smallmouth Bass	118	15
2004	December	11	E	Electrofishing	Spottail Shiner	51	1
2004	December	11	W	Electrofishing	Spottail Shiner	63	2
2004	December	12	E	Electrofishing	Spottail Shiner	61	1
2004	December	12	E	Electrofishing	Spottail Shiner	56	1
2004	December	13	W	Electrofishing	Spottail Shiner	64	2
2004	December	13	W	Electrofishing	Spottail Shiner	65	2
2004	December	13	W	Electrofishing	Spottail Shiner	104	4
2004	December	13	W	Electrofishing	Spottail Shiner	26	1
2004	December	13	W	Electrofishing	Spottail Shiner	33	1
2004	December	13	W	Electrofishing	Spottail Shiner	28	1
2004	December	13	W	Electrofishing	Spottail Shiner	35	1
2004	December	13	W	Electrofishing	Spottail Shiner	30	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2004	December	13	W	Electrofishing	Spottail Shiner	31	1
2004	December	13	W	Electrofishing	Spottail Shiner	30	1
2004	December	13	W	Electrofishing	Spottail Shiner	32	1
2004	December	13	W	Electrofishing	Spottail Shiner	33	1
2004	December	13	W	Electrofishing	Spottail Shiner		35
2004	December	14	W	Electrofishing	Spottail Shiner	72	2
2004	December	14	W	Electrofishing	Spottail Shiner	65	1
2004	December	14	W	Electrofishing	Spottail Shiner	54	1
2004	December	14	W	Electrofishing	Spottail Shiner	77	2
2004	December	14	W	Electrofishing	Spottail Shiner	59	1
2004	December	14	W	Electrofishing	Spottail Shiner	60	1
2004	December	14	W	Electrofishing	Spottail Shiner	55	1
2004	December	14	W	Electrofishing	Spottail Shiner	61	1
2004	December	13	W	Electrofishing	Tessellated Darter	77	3
2004	December	18		Electrofishing	Yellow Perch	107	14
2004	December	17		Electrofishing	Yellow Perch	209	116
2005	April	4		3/4-in. Mesh Trapnet	Black Crappie	293	372
2005	April	4		3/4-in. Mesh Trapnet	Black Crappie	251	238
2005	April	4		3/4-in. Mesh Trapnet	Black Crappie	208	143
2005	April	5		3/4-in. Mesh Trapnet	Rock Bass	219	192
2005	April	5		3/4-in. Mesh Trapnet	Smallmouth Bass	171	66
2005	May	4		3/4-in. Mesh Trapnet	Black Crappie	200	100
2005	May	4		3/4-in. Mesh Trapnet	Black Crappie	245	200
2005	May	4		3/4-in. Mesh Trapnet	Black Crappie	238	180
2005	May	4		3/4-in. Mesh Trapnet	Black Crappie	232	183
2005	May	4		3/4-in. Mesh Trapnet	Bluegill	220	246
2005	May	4		3/4-in. Mesh Trapnet	Bluegill	198	172
2005	May	5		3/4-in. Mesh Trapnet	Bluegill	219	210
2005	May	4		3/4-in. Mesh Trapnet	Bluegill	182	133
2005	May	4		3/4-in. Mesh Trapnet	Bluegill	180	130
2005	May	1	E	3/4-in. Mesh Trapnet	Eastern Silvery Minnow	92	6
2005	May	1	E	3/4-in. Mesh Trapnet	Eastern Silvery Minnow	101	8
2005	May	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	258	232
2005	May	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	374	725
2005	May	5		3/4-in. Mesh Trapnet	Smallmouth Bass	303	341
2005	May	4		3/4-in. Mesh Trapnet	Smallmouth Bass	354	525
2005	May	4		3/4-in. Mesh Trapnet	Smallmouth Bass	209	107
2005	May	5		3/4-in. Mesh Trapnet	Smallmouth Bass	300	350

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	May	5		3/4-in. Mesh Trapnet	Smallmouth Bass	196	90
2005	May	4		3/4-in. Mesh Trapnet	Smallmouth Bass	372	670
2005	May	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	105	11
2005	May	1	E	3/4-in. Mesh Trapnet	Spottail Shiner	115	13
2005	May	1	E	3/4-in. Mesh Trapnet	White Sucker	405	672
2005	May	1	E	3/4-in. Mesh Trapnet	White Sucker	281	253
2005	June	4		3/4-in. Mesh Trapnet	Bluegill	164	87
2005	June	5		3/4-in. Mesh Trapnet	Bluegill	198	172
2005	June	5		3/4-in. Mesh Trapnet	Bluegill	213	201
2005	June	3	E	3/4-in. Mesh Trapnet	Margined Madtom	97	10
2005	June	3	E	3/4-in. Mesh Trapnet	Margined Madtom	93	9
2005	June	1	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	84	12
2005	June	1	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	83	11
2005	June	2	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	101	22
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	100	23
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	137	55
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	157	91
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	145	70
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	93	18
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	126	38
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	143	71
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	123	38
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	145	73
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	116	33
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	147	53
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	97	21
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	151	82
2005	June	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	96	11
2005	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	64	8
2005	June	1	W	3/4-in. Mesh Trapnet	Rock Bass	103	21
2005	June	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	86	9
2005	June	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	91	11
2005	June	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	93	12
2005	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	425	848
2005	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	72	7
2005	June	4		3/4-in. Mesh Trapnet	Smallmouth Bass	100	12
2005	June	1	W	3/4-in. Mesh Trapnet	Smallmouth Bass	84	8
2005	June	5		3/4-in. Mesh Trapnet	Smallmouth Bass	205	97

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	June	4		3/4-in. Mesh Trapnet	Smallmouth Bass	164	46
2005	June	4		3/4-in. Mesh Trapnet	Smallmouth Bass	97	11
2005	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	106	17
2005	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	129	23
2005	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	151	46
2005	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	171	63
2005	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	135	31
2005	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	172	73
2005	June	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	143	41
2005	June	1	W	3/4-in. Mesh Trapnet	Spottail Shiner	71	2
2005	June	1	W	3/4-in. Mesh Trapnet	Tessellated Darter	53	1
2005	June	1	W	3/4-in. Mesh Trapnet	White Sucker	153	48
2005	June	1	W	3/4-in. Mesh Trapnet	White Sucker	251	177
2005	June	3	E	3/4-in. Mesh Trapnet	Yellow Perch	189	62
2005	June	3	E	3/4-in. Mesh Trapnet	Yellow Perch	188	74
2005	July	1	W	3/4-in. Mesh Trapnet	Bluegill	230	268
2005	July	1	W	3/4-in. Mesh Trapnet	Bluegill	176	112
2005	July	2	W	3/4-in. Mesh Trapnet	Bluegill	216	198
2005	July	3	E	3/4-in. Mesh Trapnet	Bluegill	241	260
2005	July	1	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	85	14
2005	July	2	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	137	38
2005	July	2	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	134	37
2005	July	2	W	3/4-in. Mesh Trapnet	Rock Bass	144	46
2005	July	2	W	3/4-in. Mesh Trapnet	Rock Bass	221	210
2005	July	1	W	3/4-in. Mesh Trapnet	Rock Bass	175	134
2005	July	1	E	3/4-in. Mesh Trapnet	Rock Bass	146	62
2005	July	1	E	3/4-in. Mesh Trapnet	Rock Bass	190	156
2005	July	2	W	3/4-in. Mesh Trapnet	Rock Bass	167	91
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	395	862
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	225	112
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	329	440
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	115	14
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	185	64
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	146	37
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	188	90
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	166	51
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	142	31
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	130	21

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	139	30
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	160	41
2005	July	5		3/4-in. Mesh Trapnet	Smallmouth Bass	190	83
2005	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	182	101
2005	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	99	10
2005	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	160	64
2005	July	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	123	21
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	479	1450
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	213	109
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	161	52
2005	July	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	179	53
2005	July	5		3/4-in. Mesh Trapnet	White Perch	112	11
2005	August	3	E	3/4-in. Mesh Trapnet	Bluegill	241	316
2005	August	2	W	3/4-in. Mesh Trapnet	Bluegill	183	149
2005	August	1	E	3/4-in. Mesh Trapnet	Bluegill	236	300
2005	August	2	W	3/4-in. Mesh Trapnet	Bluegill	198	68
2005	August	3	E	3/4-in. Mesh Trapnet	Redbreast Sunfish	241	256
2005	August	2	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	166	82
2005	August	2	W	3/4-in. Mesh Trapnet	Redbreast Sunfish	176	111
2005	August	2	W	3/4-in. Mesh Trapnet	Rock Bass	156	73
2005	August	1	E	3/4-in. Mesh Trapnet	Rock Bass	197	158
2005	August	2	W	3/4-in. Mesh Trapnet	Rock Bass	195	172
2005	August	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	342	522
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	179	68
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	142	43
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	235	173
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	166	64
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	141	42
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	210	108
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	120	12
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	119	11
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	114	31
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	179	78
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	172	60
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	149	41
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	128	18
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	106	14
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	132	27

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	145	35
2005	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	216	124
2005	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	223	121
2005	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	222	146
2005	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	385	790
2005	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	155	47
2005	August	3	E	3/4-in. Mesh Trapnet	Smallmouth Bass	294	351
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	156	48
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	128	23
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	189	78
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	150	37
2005	August	5		3/4-in. Mesh Trapnet	Smallmouth Bass	150	42
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	181	81
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	171	73
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	135	26
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	138	29
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	157	51
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	141	38
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	156	52
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	144	41
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	220	131
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	167	55
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	146	39
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	134	28
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	192	81
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	128	27
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	148	46
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	139	31
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	174	71
2005	August	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	145	38
2005	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	127	24
2005	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	136	31
2005	August	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	195	106
2005	September	2	W	3/4-in. Mesh Trapnet	Black Crappie	214	153
2005	September	2	W	3/4-in. Mesh Trapnet	Bluegill	222	230
2005	September	2	W	3/4-in. Mesh Trapnet	Bluegill	196	218
2005	September	2	W	3/4-in. Mesh Trapnet	Bluegill	207	239
2005	September	2	W	3/4-in. Mesh Trapnet	Bluegill	198	166

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	2	W	3/4-in. Mesh Trapnet	Bluegill	35	1
2005	September	4		3/4-in. Mesh Trapnet	Pumpkinseed	116	40
2005	September	4		3/4-in. Mesh Trapnet	Pumpkinseed	117	38
2005	September	4		3/4-in. Mesh Trapnet	Redbreast Sunfish	120	42
2005	September	1	E	3/4-in. Mesh Trapnet	Smallmouth Bass	203	121
2005	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	275	298
2005	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	211	110
2005	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	435	1000
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	165	68
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	163	61
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	134	40
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	123	29
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	146	49
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	170	73
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	137	41
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	152	46
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	165	59
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	143	41
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	141	38
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	148	51
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	162	63
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	157	53
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	115	13
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	143	38
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	136	31
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	195	98
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	234	162
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	125	23
2005	September	5		3/4-in. Mesh Trapnet	Smallmouth Bass	116	21
2005	September	2	W	3/4-in. Mesh Trapnet	Smallmouth Bass	245	1064
2005	September	5		3/4-in. Mesh Trapnet	Sunfish Family	26	1
2005	April	18		Electrofishing	American Eel	460	380
2005	April	18		Electrofishing	Black Crappie	277	320
2005	April	18		Electrofishing	Black Crappie	240	220
2005	April	18		Electrofishing	Black Crappie	221	148
2005	April	18		Electrofishing	Black Crappie	254	252
2005	April	18		Electrofishing	Black Crappie	255	204
2005	April	18		Electrofishing	Black Crappie	196	98

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	April	18		Electrofishing	Black Crappie	212	127
2005	April	18		Electrofishing	Black Crappie	195	98
2005	April	18		Electrofishing	Bluegill	205	172
2005	April	18		Electrofishing	Bluegill	166	80
2005	April	16		Electrofishing	Bluegill	249	380
2005	April	16		Electrofishing	Bluegill	210	210
2005	April	13	W	Electrofishing	Golden Shiner	115	10
2005	April	18		Electrofishing	Largemouth Bass	418	1000
2005	April	18		Electrofishing	Largemouth Bass	400	1200
2005	April	18		Electrofishing	Largemouth Bass	323	440
2005	April	17		Electrofishing	Largemouth Bass	517	2010
2005	April	16		Electrofishing	Largemouth Bass	465	1200
2005	April	16		Electrofishing	Largemouth Bass	546	3500
2005	April	13	E	Electrofishing	Margined Madtom	75	5
2005	April	13	E	Electrofishing	Margined Madtom	45	2
2005	April	18		Electrofishing	Pumpkinseed	101	20
2005	April	18		Electrofishing	Rock Bass	164	91
2005	April	18		Electrofishing	Rock Bass	103	25
2005	April	11	W	Electrofishing	Smallmouth Bass	410	840
2005	April	16		Electrofishing	Smallmouth Bass	438	950
2005	April	16		Electrofishing	Smallmouth Bass	272	260
2005	April	16		Electrofishing	Smallmouth Bass	432	1050
2005	April	16		Electrofishing	Smallmouth Bass	379	668
2005	April	13	W	Electrofishing	Smallmouth Bass	88	11
2005	April	15	W	Electrofishing	Smallmouth Bass	394	822
2005	April	12	E	Electrofishing	Spottail Shiner	66	2
2005	April	13	W	Electrofishing	Spottail Shiner	60	2
2005	April	13	W	Electrofishing	Spottail Shiner	63	2
2005	April	14	W	Electrofishing	Spottail Shiner	110	12
2005	April	14	W	Electrofishing	Spottail Shiner	105	9
2005	April	14	W	Electrofishing	Spottail Shiner	112	12
2005	April	14	W	Electrofishing	Spottail Shiner	105	10
2005	April	14	W	Electrofishing	Spottail Shiner	102	10
2005	April	14	W	Electrofishing	Spottail Shiner	105	11
2005	April	14	W	Electrofishing	Spottail Shiner	100	10
2005	April	14	W	Electrofishing	Spottail Shiner	115	15
2005	April	14	W	Electrofishing	Spottail Shiner	112	12
2005	April	14	W	Electrofishing	Spottail Shiner	107	12

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	April	14	W	Electrofishing	Spottail Shiner	108	15
2005	April	14	W	Electrofishing	Spottail Shiner	82	7
2005	April	14	W	Electrofishing	Spottail Shiner	106	12
2005	April	14	W	Electrofishing	Spottail Shiner	111	14
2005	April	14	W	Electrofishing	Spottail Shiner	102	11
2005	April	14	W	Electrofishing	Spottail Shiner	75	3
2005	April	14	W	Electrofishing	Spottail Shiner	106	12
2005	April	14	W	Electrofishing	Spottail Shiner	109	14
2005	April	13	E	Electrofishing	Spottail Shiner	58	2
2005	April	14	E	Electrofishing	Spottail Shiner	32	1
2005	April	15	W	Electrofishing	Spottail Shiner	127	19
2005	April	12	W	Electrofishing	Tessellated Darter	57	2
2005	April	12	W	Electrofishing	Tessellated Darter	48	1
2005	April	18		Electrofishing	Tessellated Darter	58	1
2005	April	13	E	Electrofishing	Tessellated Darter	58	2
2005	April	13	E	Electrofishing	Tessellated Darter	52	2
2005	April	13	E	Electrofishing	Tessellated Darter	52	2
2005	April	13	E	Electrofishing	Tessellated Darter	55	2
2005	April	13	E	Electrofishing	Tessellated Darter	54	2
2005	April	15	E	Electrofishing	Tessellated Darter	58	2
2005	April	12	E	Electrofishing	White Sucker	507	1400
2005	April	18		Electrofishing	White Sucker	250	150
2005	April	18		Electrofishing	White Sucker	122	8
2005	April	16		Electrofishing	White Sucker	410	770
2005	April	16		Electrofishing	White Sucker	412	868
2005	April	15	W	Electrofishing	White Sucker	447	895
2005	April	15	W	Electrofishing	White Sucker	178	65
2005	April	15	W	Electrofishing	White Sucker	451	1505
2005	April	12	E	Electrofishing	Yellow Perch	99	5
2005	April	18		Electrofishing	Yellow Perch	312	422
2005	April	18		Electrofishing	Yellow Perch	273	275
2005	April	18		Electrofishing	Yellow Perch	238	160
2005	April	18		Electrofishing	Yellow Perch	119	21
2005	April	18		Electrofishing	Yellow Perch	115	21
2005	May	12	W	Electrofishing	American Eel	630	622
2005	May	18		Electrofishing	American Eel	580	385
2005	May	13	E	Electrofishing	American Eel	600	450
2005	May	12	E	Electrofishing	Bluegill	215	200

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	May	17		Electrofishing	Bluegill	214	245
2005	May	16		Electrofishing	Bluegill	212	215
2005	May	16		Electrofishing	Bluegill	219	190
2005	May	16		Electrofishing	Bluegill	169	95
2005	May	18		Electrofishing	Bluegill	233	300
2005	May	18		Electrofishing	Bluegill	144	68
2005	May	18		Electrofishing	Bluegill	144	60
2005	May	14	W	Electrofishing	Brown Trout	260	230
2005	May	11	E	Electrofishing	Fallfish	144	36
2005	May	11	W	Electrofishing	Fallfish	232	140
2005	May	12	E	Electrofishing	Fallfish	203	87
2005	May	12	E	Electrofishing	Fallfish	153	38
2005	May	11	W	Electrofishing	Golden Shiner	103	10
2005	May	17		Electrofishing	Largemouth Bass	484	1750
2005	May	17		Electrofishing	Largemouth Bass	360	700
2005	May	18		Electrofishing	Largemouth Bass	473	1550
2005	May	18		Electrofishing	Largemouth Bass	490	1700
2005	May	18		Electrofishing	Largemouth Bass	518	2225
2005	May	18		Electrofishing	Largemouth Bass	408	800
2005	May	18		Electrofishing	Largemouth Bass	497	1925
2005	May	18		Electrofishing	Largemouth Bass	520	2025
2005	May	18		Electrofishing	Largemouth Bass	467	1850
2005	May	18		Electrofishing	Largemouth Bass	503	2225
2005	May	13	E	Electrofishing	Largemouth Bass	345	490
2005	May	16		Electrofishing	Redbreast Sunfish	159	90
2005	May	13	W	Electrofishing	Redbreast Sunfish	103	15
2005	May	13	W	Electrofishing	Smallmouth Bass	136	25
2005	May	13	W	Electrofishing	Smallmouth Bass	67	3
2005	May	11	W	Electrofishing	Spottail Shiner	144	30
2005	May	11	W	Electrofishing	Spottail Shiner	140	25
2005	May	11	W	Electrofishing	Spottail Shiner	149	32
2005	May	11	W	Electrofishing	Spottail Shiner	65	2
2005	May	11	W	Electrofishing	Spottail Shiner	37	1
2005	May	11	W	Electrofishing	Spottail Shiner	55	1
2005	May	11	W	Electrofishing	Spottail Shiner	36	1
2005	May	11	W	Electrofishing	Spottail Shiner	31	1
2005	May	11	W	Electrofishing	Spottail Shiner	44	1
2005	May	11	W	Electrofishing	Spottail Shiner	57	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	May	11	W	Electrofishing	Spottail Shiner	127	22
2005	May	11	W	Electrofishing	Spottail Shiner	87	18
2005	May	11	W	Electrofishing	Spottail Shiner	59	2
2005	May	11	W	Electrofishing	Spottail Shiner	99	7
2005	May	11	W	Electrofishing	Spottail Shiner	130	25
2005	May	11	W	Electrofishing	Spottail Shiner	78	8
2005	May	11	W	Electrofishing	Spottail Shiner	113	20
2005	May	11	W	Electrofishing	Spottail Shiner	71	10
2005	May	11	W	Electrofishing	Spottail Shiner	71	10
2005	May	11	W	Electrofishing	Spottail Shiner	56	2
2005	May	11	W	Electrofishing	Spottail Shiner	68	2
2005	May	11	W	Electrofishing	Spottail Shiner	79	4
2005	May	11	W	Electrofishing	Spottail Shiner	55	2
2005	May	11	W	Electrofishing	Spottail Shiner	36	1
2005	May	11	W	Electrofishing	Spottail Shiner	31	1
2005	May	11	W	Electrofishing	Spottail Shiner	38	1
2005	May	11	W	Electrofishing	Spottail Shiner	39	1
2005	May	12	E	Electrofishing	Spottail Shiner	62	2
2005	May	12	E	Electrofishing	Spottail Shiner	126	20
2005	May	16		Electrofishing	Spottail Shiner	55	1
2005	May	16		Electrofishing	Spottail Shiner	55	1
2005	May	13	E	Electrofishing	Spottail Shiner	44	1
2005	May	13	E	Electrofishing	Spottail Shiner	40	1
2005	May	13	E	Electrofishing	Spottail Shiner	35	1
2005	May	13	E	Electrofishing	Spottail Shiner	41	1
2005	May	13	E	Electrofishing	Spottail Shiner	36	1
2005	May	13	E	Electrofishing	Spottail Shiner	46	1
2005	May	13	E	Electrofishing	Spottail Shiner	40	1
2005	May	13	E	Electrofishing	Spottail Shiner	38	1
2005	May	13	E	Electrofishing	Spottail Shiner	35	1
2005	May	13	E	Electrofishing	Spottail Shiner	37	1
2005	May	13	E	Electrofishing	Spottail Shiner	38	1
2005	May	13	E	Electrofishing	Spottail Shiner	34	1
2005	May	13	E	Electrofishing	Spottail Shiner	33	1
2005	May	13	E	Electrofishing	Spottail Shiner	35	1
2005	May	13	E	Electrofishing	Spottail Shiner	33	1
2005	May	13	E	Electrofishing	Spottail Shiner	57	2
2005	May	13	E	Electrofishing	Spottail Shiner	32	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	May	13	E	Electrofishing	Spottail Shiner	77	10
2005	May	14	W	Electrofishing	Spottail Shiner	43	1
2005	May	14	W	Electrofishing	Spottail Shiner	42	1
2005	May	14	W	Electrofishing	Spottail Shiner	42	1
2005	May	14	W	Electrofishing	Spottail Shiner	48	1
2005	May	14	W	Electrofishing	Spottail Shiner	43	1
2005	May	14	W	Electrofishing	Spottail Shiner	79	4
2005	May	14	W	Electrofishing	Spottail Shiner	43	1
2005	May	14	W	Electrofishing	Spottail Shiner	44	1
2005	May	14	W	Electrofishing	Spottail Shiner	76	3
2005	May	14	W	Electrofishing	Spottail Shiner	46	1
2005	May	14	W	Electrofishing	Spottail Shiner	72	3
2005	May	14	W	Electrofishing	Spottail Shiner	36	1
2005	May	14	W	Electrofishing	Spottail Shiner	37	1
2005	May	14	W	Electrofishing	Spottail Shiner	101	8
2005	May	14	W	Electrofishing	Spottail Shiner	84	4
2005	May	14	W	Electrofishing	Spottail Shiner	79	4
2005	May	14	W	Electrofishing	Spottail Shiner	43	1
2005	May	14	W	Electrofishing	Spottail Shiner	73	4
2005	May	14	W	Electrofishing	Spottail Shiner	62	3
2005	May	14	W	Electrofishing	Spottail Shiner	78	4
2005	May	14	W	Electrofishing	Spottail Shiner	166	48
2005	May	14	W	Electrofishing	Spottail Shiner	166	50
2005	May	14	W	Electrofishing	Spottail Shiner	82	4
2005	May	14	W	Electrofishing	Spottail Shiner	84	4
2005	May	14	W	Electrofishing	Spottail Shiner	107	10
2005	May	14	W	Electrofishing	Spottail Shiner	79	3
2005	May	14	W	Electrofishing	Spottail Shiner	77	3
2005	May	14	W	Electrofishing	Spottail Shiner	60	3
2005	May	14	W	Electrofishing	Spottail Shiner	64	2
2005	May	14	W	Electrofishing	Spottail Shiner	65	3
2005	May	11	E	Electrofishing	Tessellated Darter	63	2
2005	May	11	E	Electrofishing	Tessellated Darter	65	2
2005	May	11	E	Electrofishing	Tessellated Darter	53	1
2005	May	11	E	Electrofishing	Tessellated Darter	55	1
2005	May	11	E	Electrofishing	Tessellated Darter	51	1
2005	May	11	E	Electrofishing	Tessellated Darter	54	1
2005	May	15	E	Electrofishing	Tessellated Darter	63	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	May	15	E	Electrofishing	Tessellated Darter	55	1
2005	May	11	E	Electrofishing	White Sucker	376	602
2005	May	11	W	Electrofishing	White Sucker	480	1100
2005	May	11	W	Electrofishing	White Sucker	495	1200
2005	May	11	W	Electrofishing	White Sucker	429	850
2005	May	11	W	Electrofishing	White Sucker	449	875
2005	May	11	W	Electrofishing	White Sucker	522	1400
2005	May	11	W	Electrofishing	White Sucker	510	1550
2005	May	11	W	Electrofishing	White Sucker	451	1300
2005	May	12	E	Electrofishing	White Sucker	438	850
2005	May	12	E	Electrofishing	White Sucker	473	1000
2005	May	12	E	Electrofishing	White Sucker	505	1375
2005	May	12	E	Electrofishing	White Sucker	495	1400
2005	May	12	E	Electrofishing	White Sucker	498	1250
2005	May	12	E	Electrofishing	White Sucker	471	1000
2005	May	12	E	Electrofishing	White Sucker	431	900
2005	May	12	W	Electrofishing	White Sucker	425	850
2005	May	12	W	Electrofishing	White Sucker	475	1025
2005	May	13	E	Electrofishing	White Sucker	420	852
2005	May	14	E	Electrofishing	White Sucker	414	850
2005	May	14	E	Electrofishing	White Sucker	508	1450
2005	May	14	E	Electrofishing	White Sucker	463	1150
2005	May	14	W	Electrofishing	White Sucker	472	1300
2005	May	14	W	Electrofishing	White Sucker	456	1075
2005	May	14	W	Electrofishing	White Sucker	424	850
2005	May	14	W	Electrofishing	White Sucker	536	1550
2005	May	14	W	Electrofishing	White Sucker	445	975
2005	May	15	W	Electrofishing	White Sucker	415	800
2005	May	11	E	Electrofishing	Yellow Perch	211	101
2005	May	11	W	Electrofishing	Yellow Perch	159	52
2005	May	12	E	Electrofishing	Yellow Perch	171	55
2005	May	18		Electrofishing	Yellow Perch	89	11
2005	June	11	W	Electrofishing	American Eel	545	360
2005	June	11	E	Electrofishing	American Eel	630	550
2005	June	12	W	Electrofishing	American Eel	560	380
2005	June	13	W	Electrofishing	Black Crappie	233	180
2005	June	12	E	Electrofishing	Bluegill	233	260
2005	June	13	W	Electrofishing	Bluegill	184	140

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	June	18		Electrofishing	Bluegill	169	88
2005	June	18		Electrofishing	Bluegill	172	105
2005	June	18		Electrofishing	Bluegill	82	4
2005	June	18		Electrofishing	Bluegill	204	182
2005	June	13	E	Electrofishing	Bluegill	225	250
2005	June	13	E	Electrofishing	Bluegill	225	280
2005	June	13	E	Electrofishing	Bluegill	202	200
2005	June	12	E	Electrofishing	Eastern Silvery Minnow	90	10
2005	June	13	E	Electrofishing	Eastern Silvery Minnow	95	7
2005	June	13	E	Electrofishing	Eastern Silvery Minnow	142	20
2005	June	13	E	Electrofishing	Eastern Silvery Minnow	95	5
2005	June	11	W	Electrofishing	Fallfish	164	52
2005	June	11	W	Electrofishing	Fallfish	210	115
2005	June	11	W	Electrofishing	Fallfish	234	170
2005	June	11	E	Electrofishing	Fallfish	92	5
2005	June	11	E	Electrofishing	Fallfish	278	62
2005	June	11	E	Electrofishing	Fallfish	252	40
2005	June	11	E	Electrofishing	Fallfish	170	49
2005	June	14	W	Electrofishing	Golden Shiner	62	2
2005	June	14	W	Electrofishing	Golden Shiner	44	2
2005	June	14	W	Electrofishing	Golden Shiner	50	3
2005	June	14	E	Electrofishing	Golden Shiner	81	3
2005	June	14	E	Electrofishing	Golden Shiner	54	2
2005	June	14	E	Electrofishing	Golden Shiner	72	4
2005	June	15	E	Electrofishing	Golden Shiner	83	5
2005	June	11	E	Electrofishing	Largemouth Bass	341	480
2005	June	12	W	Electrofishing	Largemouth Bass	385	900
2005	June	13	W	Electrofishing	Largemouth Bass	314	440
2005	June	18		Electrofishing	Largemouth Bass	55	1
2005	June	18		Electrofishing	Largemouth Bass	74	4
2005	June	18		Electrofishing	Largemouth Bass	180	81
2005	June	14	W	Electrofishing	Pumpkinseed	84	4
2005	June	11	W	Electrofishing	Redbreast Sunfish	137	75
2005	June	11	E	Electrofishing	Redbreast Sunfish	157	82
2005	June	12	W	Electrofishing	Redbreast Sunfish	114	32
2005	June	12	W	Electrofishing	Redbreast Sunfish	86	12
2005	June	12	W	Electrofishing	Redbreast Sunfish	122	44
2005	June	13	W	Electrofishing	Redbreast Sunfish	147	70

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	June	13	E	Electrofishing	Redbreast Sunfish	150	82
2005	June	13	E	Electrofishing	Redbreast Sunfish	155	82
2005	June	14	W	Electrofishing	Redbreast Sunfish	150	65
2005	June	14	W	Electrofishing	Redbreast Sunfish	119	20
2005	June	15	E	Electrofishing	Redbreast Sunfish	128	42
2005	June	15	E	Electrofishing	Redbreast Sunfish	130	50
2005	June	15	E	Electrofishing	Redbreast Sunfish	170	125
2005	June	15	E	Electrofishing	Redbreast Sunfish	165	90
2005	June	11	W	Electrofishing	Smallmouth Bass	243	200
2005	June	11	E	Electrofishing	Smallmouth Bass	173	70
2005	June	11	E	Electrofishing	Smallmouth Bass	192	98
2005	June	12	W	Electrofishing	Smallmouth Bass	92	3
2005	June	18		Electrofishing	Smallmouth Bass	178	64
2005	June	18		Electrofishing	Smallmouth Bass	145	40
2005	June	18		Electrofishing	Smallmouth Bass	208	122
2005	June	13	E	Electrofishing	Smallmouth Bass	82	3
2005	June	13	E	Electrofishing	Smallmouth Bass	103	10
2005	June	13	E	Electrofishing	Smallmouth Bass	118	72
2005	June	13	E	Electrofishing	Smallmouth Bass	65	3
2005	June	15	E	Electrofishing	Smallmouth Bass	85	7
2005	June	11	W	Electrofishing	Spottail Shiner	63	2
2005	June	11	W	Electrofishing	Spottail Shiner	57	2
2005	June	11	W	Electrofishing	Spottail Shiner	58	1
2005	June	11	W	Electrofishing	Spottail Shiner	56	1
2005	June	11	E	Electrofishing	Spottail Shiner	93	4
2005	June	11	E	Electrofishing	Spottail Shiner	93	4
2005	June	11	E	Electrofishing	Spottail Shiner	82	3
2005	June	13	W	Electrofishing	Spottail Shiner	48	1
2005	June	13	W	Electrofishing	Spottail Shiner	63	1
2005	June	13	W	Electrofishing	Spottail Shiner	63	1
2005	June	18		Electrofishing	Spottail Shiner	63	1
2005	June	14	W	Electrofishing	Spottail Shiner	110	3
2005	June	14	W	Electrofishing	Spottail Shiner	72	2
2005	June	11	W	Electrofishing	White Sucker	467	1100
2005	June	11	W	Electrofishing	White Sucker	465	1125
2005	June	11	W	Electrofishing	White Sucker	422	850
2005	June	11	E	Electrofishing	White Sucker	460	950
2005	June	11	E	Electrofishing	White Sucker	308	315

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	June	12	W	Electrofishing	White Sucker	484	1300
2005	June	12	W	Electrofishing	White Sucker	493	1200
2005	June	12	E	Electrofishing	White Sucker	426	800
2005	June	12	E	Electrofishing	White Sucker	440	950
2005	June	12	E	Electrofishing	White Sucker	448	875
2005	June	12	E	Electrofishing	White Sucker	199	250
2005	June	13	W	Electrofishing	White Sucker	415	700
2005	June	13	W	Electrofishing	White Sucker	445	1000
2005	June	13	W	Electrofishing	White Sucker	478	1500
2005	June	13	W	Electrofishing	White Sucker	514	1450
2005	June	13	W	Electrofishing	White Sucker	490	1200
2005	June	13	W	Electrofishing	White Sucker	490	1200
2005	June	13	W	Electrofishing	White Sucker	389	600
2005	June	13	W	Electrofishing	White Sucker	532	1450
2005	June	13	W	Electrofishing	White Sucker	429	950
2005	June	13	W	Electrofishing	White Sucker	437	700
2005	June	13	W	Electrofishing	White Sucker	469	1000
2005	June	13	W	Electrofishing	White Sucker	483	1300
2005	June	13	W	Electrofishing	White Sucker	422	775
2005	June	13	W	Electrofishing	White Sucker	458	975
2005	June	13	W	Electrofishing	White Sucker	410	775
2005	June	13	W	Electrofishing	White Sucker	465	1100
2005	June	13	W	Electrofishing	White Sucker	412	700
2005	June	13	W	Electrofishing	White Sucker	490	1300
2005	June	13	W	Electrofishing	White Sucker	423	850
2005	June	13	W	Electrofishing	White Sucker	443	800
2005	June	13	W	Electrofishing	White Sucker	425	900
2005	June	13	W	Electrofishing	White Sucker	437	900
2005	June	13	W	Electrofishing	White Sucker	438	900
2005	June	13	W	Electrofishing	White Sucker	462	925
2005	June	13	W	Electrofishing	White Sucker	392	700
2005	June	13	W	Electrofishing	White Sucker	419	775
2005	June	13	W	Electrofishing	White Sucker	370	500
2005	June	13	W	Electrofishing	White Sucker	394	650
2005	June	13	W	Electrofishing	White Sucker	370	550
2005	June	13	W	Electrofishing	White Sucker	411	725
2005	June	13	E	Electrofishing	White Sucker	395	700
2005	June	13	E	Electrofishing	White Sucker	417	875

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	June	13	E	Electrofishing	White Sucker	465	1100
2005	June	13	E	Electrofishing	White Sucker	488	1300
2005	June	13	E	Electrofishing	White Sucker	390	650
2005	June	13	E	Electrofishing	White Sucker	440	900
2005	June	14	W	Electrofishing	White Sucker	393	675
2005	June	14	W	Electrofishing	White Sucker	490	1250
2005	June	14	W	Electrofishing	White Sucker	390	550
2005	June	14	W	Electrofishing	White Sucker	498	1250
2005	June	14	W	Electrofishing	White Sucker	475	1175
2005	June	14	W	Electrofishing	White Sucker	407	925
2005	June	14	W	Electrofishing	White Sucker	413	725
2005	June	14	E	Electrofishing	White Sucker	428	875
2005	June	14	E	Electrofishing	White Sucker	387	650
2005	June	14	E	Electrofishing	White Sucker	485	1250
2005	June	14	E	Electrofishing	White Sucker	471	1100
2005	June	15	W	Electrofishing	White Sucker	492	1250
2005	June	15	E	Electrofishing	White Sucker	440	900
2005	June	15	E	Electrofishing	White Sucker	510	1775
2005	June	15	E	Electrofishing	White Sucker	445	950
2005	June	15	E	Electrofishing	White Sucker	466	1200
2005	June	15	E	Electrofishing	White Sucker	428	825
2005	June	15	E	Electrofishing	White Sucker	444	1000
2005	June	15	E	Electrofishing	White Sucker	410	750
2005	June	15	E	Electrofishing	White Sucker	416	825
2005	June	15	E	Electrofishing	White Sucker	225	130
2005	June	11	W	Electrofishing	Yellow Perch	223	130
2005	June	12	W	Electrofishing	Yellow Perch	180	65
2005	June	12	W	Electrofishing	Yellow Perch	296	75
2005	June	13	E	Electrofishing	Yellow Perch	143	20
2005	July	13	W	Electrofishing	American Eel	500	290
2005	July	13	W	Electrofishing	American Eel	450	130
2005	July	13	W	Electrofishing	American Eel	340	75
2005	July	14	E	Electrofishing	Black Crappie	273	235
2005	July	14	W	Electrofishing	Bluegill	166	90
2005	July	14	W	Electrofishing	Bluegill	195	160
2005	July	14	E	Electrofishing	Bluegill	230	240
2005	July	11	W	Electrofishing	Bluegill	170	92
2005	July	15	E	Electrofishing	Bluegill	56	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	July	15	E	Electrofishing	Bluegill	55	2
2005	July	18		Electrofishing	Bluegill	177	133
2005	July	18		Electrofishing	Bluegill	186	130
2005	July	18		Electrofishing	Bluegill	114	32
2005	July	18		Electrofishing	Bluegill	83	14
2005	July	18		Electrofishing	Bluegill	86	10
2005	July	18		Electrofishing	Bluegill	49	4
2005	July	12	E	Electrofishing	Bluegill	207	172
2005	July	12	E	Electrofishing	Bluegill	197	145
2005	July	12	E	Electrofishing	Bluegill	93	10
2005	July	12	E	Electrofishing	Bluegill	36	1
2005	July	12	E	Electrofishing	Bluegill	168	100
2005	July	15	W	Electrofishing	Bluegill	193	160
2005	July	15	W	Electrofishing	Bluegill	181	150
2005	July	15	W	Electrofishing	Bluegill	237	282
2005	July	11	W	Electrofishing	Common Carp	830	10000
2005	July	12	W	Electrofishing	Fallfish	194	70
2005	July	12	E	Electrofishing	Fallfish	160	40
2005	July	12	E	Electrofishing	Fallfish	96	5
2005	July	14	E	Electrofishing	Largemouth Bass	424	1100
2005	July	14	E	Electrofishing	Largemouth Bass	351	700
2005	July	11	W	Electrofishing	Largemouth Bass	360	660
2005	July	11	W	Electrofishing	Largemouth Bass	332	540
2005	July	11	E	Electrofishing	Largemouth Bass	346	510
2005	July	15	E	Electrofishing	Largemouth Bass	110	10
2005	July	15	E	Electrofishing	Largemouth Bass	53	2
2005	July	12	E	Electrofishing	Largemouth Bass	52	3
2005	July	12	E	Electrofishing	Largemouth Bass	55	2
2005	July	12	E	Electrofishing	Largemouth Bass	94	5
2005	July	15	W	Electrofishing	Largemouth Bass	453	1400
2005	July	14	W	Electrofishing	Pumpkinseed	83	5
2005	July	14	E	Electrofishing	Pumpkinseed	91	5
2005	July	15	E	Electrofishing	Pumpkinseed	95	12
2005	July	15	E	Electrofishing	Pumpkinseed	56	2
2005	July	18		Electrofishing	Pumpkinseed	88	13
2005	July	18		Electrofishing	Pumpkinseed	118	32
2005	July	18		Electrofishing	Pumpkinseed	85	12
2005	July	18		Electrofishing	Pumpkinseed	77	13

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	July	12	E	Electrofishing	Pumpkinseed	73	6
2005	July	12	E	Electrofishing	Pumpkinseed	82	5
2005	July	14	W	Electrofishing	Redbreast Sunfish	135	85
2005	July	14	W	Electrofishing	Redbreast Sunfish	106	22
2005	July	14	W	Electrofishing	Redbreast Sunfish	136	48
2005	July	14	W	Electrofishing	Redbreast Sunfish	155	62
2005	July	14	W	Electrofishing	Redbreast Sunfish	125	34
2005	July	14	W	Electrofishing	Redbreast Sunfish	100	14
2005	July	14	W	Electrofishing	Redbreast Sunfish	126	30
2005	July	14	E	Electrofishing	Redbreast Sunfish	157	65
2005	July	14	E	Electrofishing	Redbreast Sunfish	123	30
2005	July	11	W	Electrofishing	Redbreast Sunfish	163	80
2005	July	15	E	Electrofishing	Redbreast Sunfish	136	42
2005	July	15	E	Electrofishing	Redbreast Sunfish	111	20
2005	July	15	E	Electrofishing	Redbreast Sunfish	172	95
2005	July	15	E	Electrofishing	Redbreast Sunfish	135	35
2005	July	15	E	Electrofishing	Redbreast Sunfish	160	75
2005	July	15	E	Electrofishing	Redbreast Sunfish	145	62
2005	July	15	E	Electrofishing	Redbreast Sunfish	109	12
2005	July	15	E	Electrofishing	Redbreast Sunfish	137	50
2005	July	15	E	Electrofishing	Redbreast Sunfish	105	14
2005	July	15	E	Electrofishing	Redbreast Sunfish	112	8
2005	July	15	E	Electrofishing	Redbreast Sunfish	120	30
2005	July	15	E	Electrofishing	Redbreast Sunfish	134	30
2005	July	18		Electrofishing	Redbreast Sunfish	102	11
2005	July	12	E	Electrofishing	Redbreast Sunfish	122	22
2005	July	12	E	Electrofishing	Redbreast Sunfish	113	26
2005	July	12	E	Electrofishing	Redbreast Sunfish	137	48
2005	July	15	W	Electrofishing	Redbreast Sunfish	135	55
2005	July	15	W	Electrofishing	Redbreast Sunfish	100	25
2005	July	15	W	Electrofishing	Redbreast Sunfish	64	3
2005	July	15	W	Electrofishing	Redbreast Sunfish	50	2
2005	July	15	W	Electrofishing	Redbreast Sunfish	165	110
2005	July	15	W	Electrofishing	Redbreast Sunfish	111	30
2005	July	14	W	Electrofishing	Smallmouth Bass	289	358
2005	July	14	W	Electrofishing	Smallmouth Bass	226	147
2005	July	14	W	Electrofishing	Smallmouth Bass	93	8
2005	July	14	W	Electrofishing	Smallmouth Bass	95	7

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	July	14	W	Electrofishing	Smallmouth Bass	115	10
2005	July	14	W	Electrofishing	Smallmouth Bass	244	170
2005	July	13	E	Electrofishing	Smallmouth Bass	497	1750
2005	July	13	W	Electrofishing	Smallmouth Bass	135	30
2005	July	13	W	Electrofishing	Smallmouth Bass	94	10
2005	July	13	W	Electrofishing	Smallmouth Bass	150	40
2005	July	13	W	Electrofishing	Smallmouth Bass	103	10
2005	July	11	W	Electrofishing	Smallmouth Bass	99	10
2005	July	12	E	Electrofishing	Smallmouth Bass	95	8
2005	July	12	E	Electrofishing	Smallmouth Bass	119	18
2005	July	12	E	Electrofishing	Smallmouth Bass	180	54
2005	July	15	W	Electrofishing	Smallmouth Bass	153	60
2005	July	12	W	Electrofishing	Spottail Shiner	97	5
2005	July	12	W	Electrofishing	Spottail Shiner	100	5
2005	July	12	E	Electrofishing	Spottail Shiner	100	5
2005	July	12	E	Electrofishing	Spottail Shiner	110	5
2005	July	12	W	Electrofishing	White Sucker	503	1250
2005	July	12	W	Electrofishing	White Sucker	441	850
2005	July	12	W	Electrofishing	White Sucker	403	650
2005	July	12	W	Electrofishing	White Sucker	471	950
2005	July	12	W	Electrofishing	White Sucker	485	1050
2005	July	12	W	Electrofishing	White Sucker	467	900
2005	July	12	W	Electrofishing	White Sucker	453	1000
2005	July	12	W	Electrofishing	White Sucker	443	875
2005	July	11	W	Electrofishing	White Sucker	512	1350
2005	July	11	E	Electrofishing	White Sucker	406	700
2005	July	12	E	Electrofishing	White Sucker	515	1500
2005	July	14	W	Electrofishing	Yellow Perch	145	35
2005	July	11	W	Electrofishing	Yellow Perch	204	90
2005	July	11	W	Electrofishing	Yellow Perch	57	1
2005	July	15	E	Electrofishing	Yellow Perch	289	245
2005	July	12	E	Electrofishing	Yellow Perch	247	175
2005	July	12	E	Electrofishing	Yellow Perch	208	120
2005	July	12	E	Electrofishing	Yellow Perch	212	96
2005	July	12	E	Electrofishing	Yellow Perch	112	8
2005	July	12	E	Electrofishing	Yellow Perch	57	2
2005	July	12	E	Electrofishing	Yellow Perch	211	120
2005	August	11	W	Electrofishing	American Eel	750	1060

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	August	15	W	Electrofishing	Bluegill	204	210
2005	August	15	W	Electrofishing	Bluegill	236	300
2005	August	15	W	Electrofishing	Bluegill	75	10
2005	August	15	E	Electrofishing	Bluegill	183	135
2005	August	15	E	Electrofishing	Bluegill	215	228
2005	August	15	E	Electrofishing	Bluegill	193	
2005	August	15	E	Electrofishing	Bluegill	159	85
2005	August	15	E	Electrofishing	Bluegill	79	8
2005	August	15	E	Electrofishing	Bluegill	68	5
2005	August	15	E	Electrofishing	Bluegill	90	15
2005	August	15	E	Electrofishing	Bluegill	92	15
2005	August	14	E	Electrofishing	Bluegill	150	75
2005	August	14	E	Electrofishing	Bluegill	75	8
2005	August	14	E	Electrofishing	Bluegill	143	65
2005	August	14	E	Electrofishing	Bluegill	66	6
2005	August	14	E	Electrofishing	Bluegill	152	85
2005	August	14	E	Electrofishing	Bluegill	64	5
2005	August	14	E	Electrofishing	Bluegill	60	3
2005	August	14	E	Electrofishing	Bluegill	82	8
2005	August	14	E	Electrofishing	Bluegill	77	8
2005	August	14	W	Electrofishing	Bluegill	87	8
2005	August	14	W	Electrofishing	Bluegill	80	8
2005	August	14	W	Electrofishing	Bluegill	79	8
2005	August	13	W	Electrofishing	Bluegill	94	20
2005	August	13	W	Electrofishing	Bluegill	78	6
2005	August	13	W	Electrofishing	Bluegill	87	15
2005	August	13	W	Electrofishing	Bluegill	65	5
2005	August	13	W	Electrofishing	Bluegill	90	15
2005	August	13	E	Electrofishing	Bluegill	92	7
2005	August	13	E	Electrofishing	Bluegill	128	34
2005	August	13	E	Electrofishing	Bluegill	76	5
2005	August	13	E	Electrofishing	Bluegill	99	20
2005	August	13	E	Electrofishing	Bluegill	95	16
2005	August	13	E	Electrofishing	Bluegill	218	265
2005	August	12	E	Electrofishing	Bluegill	90	15
2005	August	12	E	Electrofishing	Bluegill	233	285
2005	August	12	E	Electrofishing	Bluegill	183	150
2005	August	12	E	Electrofishing	Bluegill	230	245

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	August	12	E	Electrofishing	Bluegill	85	6
2005	August	12	W	Electrofishing	Bluegill	216	230
2005	August	12	W	Electrofishing	Bluegill	255	330
2005	August	11	W	Electrofishing	Bluegill	114	30
2005	August	11	W	Electrofishing	Bluegill	125	40
2005	August	11	W	Electrofishing	Bluegill	140	60
2005	August	11	W	Electrofishing	Bluegill	100	20
2005	August	11	W	Electrofishing	Bluegill	145	70
2005	August	11	W	Electrofishing	Bluegill	131	50
2005	August	11	W	Electrofishing	Bluegill	122	40
2005	August	11	W	Electrofishing	Bluegill	82	6
2005	August	18		Electrofishing	Bluegill	125	40
2005	August	18		Electrofishing	Bluegill	121	40
2005	August	18		Electrofishing	Bluegill	108	27
2005	August	18		Electrofishing	Bluegill	124	47
2005	August	18		Electrofishing	Bluegill	100	23
2005	August	15	E	Electrofishing	Chain Pickerel	125	6
2005	August	11	W	Electrofishing	Chain Pickerel	290	140
2005	August	14	E	Electrofishing	Fallfish	120	15
2005	August	13	E	Electrofishing	Fallfish	189	25
2005	August	12	E	Electrofishing	Fallfish	121	36
2005	August	12	W	Electrofishing	Fallfish	134	36
2005	August	11	W	Electrofishing	Fallfish	215	110
2005	August	11	W	Electrofishing	Fallfish	213	100
2005	August	11	W	Electrofishing	Fallfish	174	65
2005	August	11	E	Electrofishing	Fallfish	195	70
2005	August	11	E	Electrofishing	Fallfish	172	50
2005	August	11	W	Electrofishing	Golden Shiner	102	5
2005	August	11	W	Electrofishing	Golden Shiner	86	4
2005	August	15	W	Electrofishing	Largemouth Bass	115	15
2005	August	15	E	Electrofishing	Largemouth Bass	79	5
2005	August	15	E	Electrofishing	Largemouth Bass	71	5
2005	August	15	E	Electrofishing	Largemouth Bass	85	5
2005	August	15	E	Electrofishing	Largemouth Bass	71	5
2005	August	15	E	Electrofishing	Largemouth Bass	69	5
2005	August	15	E	Electrofishing	Largemouth Bass	67	5
2005	August	15	E	Electrofishing	Largemouth Bass	71	5
2005	August	15	E	Electrofishing	Largemouth Bass	70	5

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	August	15	E	Electrofishing	Largemouth Bass	85	6
2005	August	15	E	Electrofishing	Largemouth Bass	90	6
2005	August	14	E	Electrofishing	Largemouth Bass	329	465
2005	August	14	E	Electrofishing	Largemouth Bass	109	15
2005	August	14	E	Electrofishing	Largemouth Bass	85	6
2005	August	14	E	Electrofishing	Largemouth Bass	65	4
2005	August	14	E	Electrofishing	Largemouth Bass	110	16
2005	August	14	E	Electrofishing	Largemouth Bass	76	5
2005	August	14	W	Electrofishing	Largemouth Bass	122	25
2005	August	14	W	Electrofishing	Largemouth Bass	74	6
2005	August	13	W	Electrofishing	Largemouth Bass	162	50
2005	August	13	W	Electrofishing	Largemouth Bass	105	6
2005	August	13	W	Electrofishing	Largemouth Bass	108	16
2005	August	13	E	Electrofishing	Largemouth Bass	407	900
2005	August	13	E	Electrofishing	Largemouth Bass	80	11
2005	August	12	E	Electrofishing	Largemouth Bass	67	6
2005	August	12	E	Electrofishing	Largemouth Bass	109	20
2005	August	12	E	Electrofishing	Largemouth Bass	130	25
2005	August	12	E	Electrofishing	Largemouth Bass	86	10
2005	August	12	E	Electrofishing	Largemouth Bass	69	5
2005	August	12	E	Electrofishing	Largemouth Bass	87	6
2005	August	12	E	Electrofishing	Largemouth Bass	81	4
2005	August	12	E	Electrofishing	Largemouth Bass	77	4
2005	August	11	W	Electrofishing	Largemouth Bass	70	4
2005	August	11	W	Electrofishing	Largemouth Bass	430	1100
2005	August	11	W	Electrofishing	Largemouth Bass	412	1050
2005	August	18		Electrofishing	Largemouth Bass	91	10
2005	August	15	E	Electrofishing	Pumpkinseed	108	25
2005	August	15	E	Electrofishing	Pumpkinseed	135	60
2005	August	14	E	Electrofishing	Pumpkinseed	82	5
2005	August	13	W	Electrofishing	Pumpkinseed	95	20
2005	August	13	W	Electrofishing	Pumpkinseed	103	30
2005	August	13	E	Electrofishing	Pumpkinseed	86	6
2005	August	13	E	Electrofishing	Pumpkinseed	93	19
2005	August	13	E	Electrofishing	Pumpkinseed	93	18
2005	August	13	E	Electrofishing	Pumpkinseed	96	25
2005	August	11	W	Electrofishing	Pumpkinseed	88	20
2005	August	11	W	Electrofishing	Pumpkinseed	94	15

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	August	15	E	Electrofishing	Redbreast Sunfish	167	110
2005	August	15	E	Electrofishing	Redbreast Sunfish	169	110
2005	August	15	E	Electrofishing	Redbreast Sunfish	176	105
2005	August	15	E	Electrofishing	Redbreast Sunfish	171	115
2005	August	14	E	Electrofishing	Redbreast Sunfish	126	35
2005	August	14	W	Electrofishing	Redbreast Sunfish	144	60
2005	August	14	W	Electrofishing	Redbreast Sunfish	150	74
2005	August	14	W	Electrofishing	Redbreast Sunfish	100	10
2005	August	13	W	Electrofishing	Redbreast Sunfish	170	115
2005	August	13	W	Electrofishing	Redbreast Sunfish	180	125
2005	August	13	E	Electrofishing	Redbreast Sunfish	83	4
2005	August	13	E	Electrofishing	Redbreast Sunfish	159	70
2005	August	13	E	Electrofishing	Redbreast Sunfish	126	35
2005	August	13	E	Electrofishing	Redbreast Sunfish	134	45
2005	August	12	E	Electrofishing	Redbreast Sunfish	168	120
2005	August	12	W	Electrofishing	Redbreast Sunfish	155	95
2005	August	12	W	Electrofishing	Redbreast Sunfish	116	30
2005	August	11	W	Electrofishing	Redbreast Sunfish	135	50
2005	August	17		Electrofishing	Redbreast Sunfish	100	20
2005	August	15	W	Electrofishing	Smallmouth Bass	127	30
2005	August	15	W	Electrofishing	Smallmouth Bass	87	8
2005	August	15	W	Electrofishing	Smallmouth Bass	130	25
2005	August	15	E	Electrofishing	Smallmouth Bass	107	15
2005	August	14	E	Electrofishing	Smallmouth Bass	121	20
2005	August	14	E	Electrofishing	Smallmouth Bass	116	20
2005	August	14	E	Electrofishing	Smallmouth Bass	120	25
2005	August	14	E	Electrofishing	Smallmouth Bass	74	4
2005	August	14	W	Electrofishing	Smallmouth Bass	156	65
2005	August	14	W	Electrofishing	Smallmouth Bass	137	45
2005	August	13	W	Electrofishing	Smallmouth Bass	116	18
2005	August	13	W	Electrofishing	Smallmouth Bass	117	5
2005	August	13	E	Electrofishing	Smallmouth Bass	141	45
2005	August	12	E	Electrofishing	Smallmouth Bass	312	430
2005	August	12	E	Electrofishing	Smallmouth Bass	89	5
2005	August	12	W	Electrofishing	Smallmouth Bass	149	50
2005	August	11	W	Electrofishing	Smallmouth Bass	190	100
2005	August	11	W	Electrofishing	Smallmouth Bass	132	28
2005	August	18		Electrofishing	Smallmouth Bass	123	25

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	August	18		Electrofishing	Smallmouth Bass	107	20
2005	August	11	W	Electrofishing	Spottail Shiner	60	2
2005	August	15	W	Electrofishing	White Sucker	317	360
2005	August	12	E	Electrofishing	White Sucker	380	410
2005	August	12	W	Electrofishing	White Sucker	477	1200
2005	August	12	W	Electrofishing	White Sucker	423	850
2005	August	12	W	Electrofishing	White Sucker	465	1100
2005	August	12	W	Electrofishing	White Sucker	330	405
2005	August	11	W	Electrofishing	White Sucker	290	275
2005	August	11	E	Electrofishing	White Sucker	503	1250
2005	August	15	E	Electrofishing	Yellow Perch	85	6
2005	August	15	E	Electrofishing	Yellow Perch	101	15
2005	August	15	E	Electrofishing	Yellow Perch	86	5
2005	August	15	E	Electrofishing	Yellow Perch	86	5
2005	August	14	E	Electrofishing	Yellow Perch	71	5
2005	August	14	E	Electrofishing	Yellow Perch	85	5
2005	August	12	E	Electrofishing	Yellow Perch	87	8
2005	August	12	E	Electrofishing	Yellow Perch	150	40
2005	August	12	E	Electrofishing	Yellow Perch	162	45
2005	August	12	E	Electrofishing	Yellow Perch	90	10
2005	August	12	E	Electrofishing	Yellow Perch	92	15
2005	August	12	E	Electrofishing	Yellow Perch	87	8
2005	August	12	E	Electrofishing	Yellow Perch	96	6
2005	August	12	E	Electrofishing	Yellow Perch	87	5
2005	August	12	E	Electrofishing	Yellow Perch	176	58
2005	August	12	E	Electrofishing	Yellow Perch	95	5
2005	August	11	W	Electrofishing	Yellow Perch	138	35
2005	August	11	W	Electrofishing	Yellow Perch	130	35
2005	August	11	W	Electrofishing	Yellow Perch	157	51
2005	August	11	W	Electrofishing	Yellow Perch	87	8
2005	September	12	W	Electrofishing	American Eel	310	40
2005	September	14	W	Electrofishing	American Eel	650	520
2005	September	11	W	Electrofishing	Black Crappie	95	10
2005	September	11	W	Electrofishing	Black Crappie	85	9
2005	September	11	W	Electrofishing	Bluegill	188	148
2005	September	11	W	Electrofishing	Bluegill	219	240
2005	September	11	W	Electrofishing	Bluegill	63	5
2005	September	11	W	Electrofishing	Bluegill	49	2

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	11	W	Electrofishing	Bluegill	42	1
2005	September	11	W	Electrofishing	Bluegill	55	2
2005	September	11	W	Electrofishing	Bluegill	42	1
2005	September	11	W	Electrofishing	Bluegill	223	275
2005	September	11	W	Electrofishing	Bluegill	112	18
2005	September	11	W	Electrofishing	Bluegill	35	1
2005	September	11	E	Electrofishing	Bluegill	167	98
2005	September	11	E	Electrofishing	Bluegill	216	200
2005	September	11	E	Electrofishing	Bluegill	236	290
2005	September	11	E	Electrofishing	Bluegill	218	215
2005	September	11	E	Electrofishing	Bluegill	208	240
2005	September	12	W	Electrofishing	Bluegill	242	224
2005	September	12	E	Electrofishing	Bluegill	45	1
2005	September	12	E	Electrofishing	Bluegill	29	1
2005	September	12	E	Electrofishing	Bluegill	27	1
2005	September	12	E	Electrofishing	Bluegill	39	1
2005	September	18		Electrofishing	Bluegill	95	20
2005	September	18		Electrofishing	Bluegill	93	18
2005	September	18		Electrofishing	Bluegill	112	38
2005	September	18		Electrofishing	Bluegill	105	24
2005	September	18		Electrofishing	Bluegill	103	18
2005	September	18		Electrofishing	Bluegill	91	16
2005	September	15	E	Electrofishing	Bluegill	115	26
2005	September	15	E	Electrofishing	Bluegill	116	32
2005	September	15	E	Electrofishing	Bluegill	116	28
2005	September	15	E	Electrofishing	Bluegill	102	22
2005	September	15	E	Electrofishing	Bluegill	105	26
2005	September	15	E	Electrofishing	Bluegill	28	1
2005	September	15	W	Electrofishing	Bluegill	106	26
2005	September	14	E	Electrofishing	Bluegill	94	18
2005	September	14	E	Electrofishing	Bluegill	120	30
2005	September	14	E	Electrofishing	Bluegill	138	36
2005	September	14	E	Electrofishing	Bluegill	80	10
2005	September	14	E	Electrofishing	Bluegill	85	12
2005	September	14	E	Electrofishing	Bluegill	128	38
2005	September	14	W	Electrofishing	Bluegill	117	30
2005	September	14	W	Electrofishing	Bluegill	110	32
2005	September	14	W	Electrofishing	Bluegill	105	28

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	14	W	Electrofishing	Bluegill	100	22
2005	September	14	W	Electrofishing	Bluegill	127	44
2005	September	14	W	Electrofishing	Bluegill	109	28
2005	September	14	W	Electrofishing	Bluegill	92	18
2005	September	14	W	Electrofishing	Bluegill	78	16
2005	September	14	W	Electrofishing	Bluegill	98	24
2005	September	14	W	Electrofishing	Bluegill	95	24
2005	September	14	W	Electrofishing	Bluegill	102	26
2005	September	14	W	Electrofishing	Bluegill	92	22
2005	September	14	W	Electrofishing	Bluegill	95	20
2005	September	14	W	Electrofishing	Bluegill	92	18
2005	September	14	W	Electrofishing	Bluegill	101	24
2005	September	14	W	Electrofishing	Bluegill	97	22
2005	September	14	W	Electrofishing	Bluegill	100	22
2005	September	14	W	Electrofishing	Bluegill	102	24
2005	September	14	W	Electrofishing	Bluegill	95	18
2005	September	14	W	Electrofishing	Bluegill	95	20
2005	September	14	W	Electrofishing	Bluegill	101	22
2005	September	14	W	Electrofishing	Bluegill	97	20
2005	September	14	W	Electrofishing	Bluegill	101	22
2005	September	14	W	Electrofishing	Bluegill	102	22
2005	September	14	W	Electrofishing	Bluegill	81	16
2005	September	14	W	Electrofishing	Bluegill	117	26
2005	September	14	W	Electrofishing	Bluegill	110	24
2005	September	13	E	Electrofishing	Bluegill	76	10
2005	September	13	E	Electrofishing	Bluegill	106	22
2005	September	13	E	Electrofishing	Bluegill	80	9
2005	September	15	E	Electrofishing	Chain Pickerel	73	104
2005	September	11	W	Electrofishing	Fallfish	88	4
2005	September	11	W	Electrofishing	Fallfish	135	12
2005	September	12	E	Electrofishing	Fallfish	140	22
2005	September	12	E	Electrofishing	Fallfish	132	24
2005	September	12	E	Electrofishing	Fallfish	147	28
2005	September	12	E	Electrofishing	Fallfish	131	22
2005	September	12	E	Electrofishing	Fallfish	150	24
2005	September	12	E	Electrofishing	Fallfish	121	16
2005	September	12	E	Electrofishing	Fallfish	132	20
2005	September	12	E	Electrofishing	Fallfish	137	30

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	12	E	Electrofishing	Fallfish	146	25
2005	September	12	E	Electrofishing	Fallfish	127	20
2005	September	12	E	Electrofishing	Fallfish	135	26
2005	September	12	E	Electrofishing	Fallfish	127	22
2005	September	12	E	Electrofishing	Fallfish	148	30
2005	September	12	E	Electrofishing	Fallfish	140	22
2005	September	14	E	Electrofishing	Fallfish	253	156
2005	September	11	E	Electrofishing	Golden Shiner	107	10
2005	September	11	E	Electrofishing	Golden Shiner	101	10
2005	September	15	E	Electrofishing	Golden Shiner	130	22
2005	September	15	E	Electrofishing	Golden Shiner	112	12
2005	September	15	E	Electrofishing	Golden Shiner	127	16
2005	September	15	E	Electrofishing	Golden Shiner	121	16
2005	September	11	W	Electrofishing	Largemouth Bass	97	12
2005	September	11	W	Electrofishing	Largemouth Bass	116	22
2005	September	11	W	Electrofishing	Largemouth Bass	65	5
2005	September	11	W	Electrofishing	Largemouth Bass	97	12
2005	September	11	W	Electrofishing	Largemouth Bass	95	12
2005	September	11	W	Electrofishing	Largemouth Bass	72	6
2005	September	11	W	Electrofishing	Largemouth Bass	89	14
2005	September	11	W	Electrofishing	Largemouth Bass	107	20
2005	September	11	W	Electrofishing	Largemouth Bass	66	4
2005	September	11	W	Electrofishing	Largemouth Bass	114	22
2005	September	11	W	Electrofishing	Largemouth Bass	85	15
2005	September	11	W	Electrofishing	Largemouth Bass	86	12
2005	September	11	W	Electrofishing	Largemouth Bass	94	15
2005	September	11	W	Electrofishing	Largemouth Bass	85	14
2005	September	11	W	Electrofishing	Largemouth Bass	86	6
2005	September	11	W	Electrofishing	Largemouth Bass	371	895
2005	September	11	W	Electrofishing	Largemouth Bass	330	484
2005	September	11	W	Electrofishing	Largemouth Bass	100	12
2005	September	11	W	Electrofishing	Largemouth Bass	122	25
2005	September	11	W	Electrofishing	Largemouth Bass	96	15
2005	September	11	W	Electrofishing	Largemouth Bass	83	8
2005	September	11	W	Electrofishing	Largemouth Bass	88	8
2005	September	11	W	Electrofishing	Largemouth Bass	97	14
2005	September	11	W	Electrofishing	Largemouth Bass	92	8
2005	September	11	W	Electrofishing	Largemouth Bass	91	7

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	11	W	Electrofishing	Largemouth Bass	91	8
2005	September	11	W	Electrofishing	Largemouth Bass	72	5
2005	September	11	W	Electrofishing	Largemouth Bass	86	7
2005	September	11	E	Electrofishing	Largemouth Bass	88	10
2005	September	11	E	Electrofishing	Largemouth Bass	84	5
2005	September	11	E	Electrofishing	Largemouth Bass	91	10
2005	September	12	W	Electrofishing	Largemouth Bass	101	9
2005	September	12	W	Electrofishing	Largemouth Bass	124	26
2005	September	12	W	Electrofishing	Largemouth Bass	105	16
2005	September	12	W	Electrofishing	Largemouth Bass	96	14
2005	September	12	W	Electrofishing	Largemouth Bass	107	16
2005	September	12	W	Electrofishing	Largemouth Bass	111	14
2005	September	12	W	Electrofishing	Largemouth Bass	91	12
2005	September	12	W	Electrofishing	Largemouth Bass	79	10
2005	September	12	E	Electrofishing	Largemouth Bass	109	22
2005	September	12	E	Electrofishing	Largemouth Bass	95	12
2005	September	12	E	Electrofishing	Largemouth Bass	93	12
2005	September	12	E	Electrofishing	Largemouth Bass	111	16
2005	September	12	E	Electrofishing	Largemouth Bass	117	26
2005	September	12	E	Electrofishing	Largemouth Bass	106	20
2005	September	12	E	Electrofishing	Largemouth Bass	87	16
2005	September	12	E	Electrofishing	Largemouth Bass	104	14
2005	September	12	E	Electrofishing	Largemouth Bass	86	14
2005	September	12	E	Electrofishing	Largemouth Bass	86	8
2005	September	12	E	Electrofishing	Largemouth Bass	68	6
2005	September	12	E	Electrofishing	Largemouth Bass	86	12
2005	September	12	E	Electrofishing	Largemouth Bass	97	12
2005	September	12	E	Electrofishing	Largemouth Bass	95	12
2005	September	12	E	Electrofishing	Largemouth Bass	89	10
2005	September	12	E	Electrofishing	Largemouth Bass	87	8
2005	September	12	E	Electrofishing	Largemouth Bass	85	8
2005	September	12	E	Electrofishing	Largemouth Bass	88	6
2005	September	12	E	Electrofishing	Largemouth Bass	109	18
2005	September	18		Electrofishing	Largemouth Bass	167	54
2005	September	18		Electrofishing	Largemouth Bass	116	18
2005	September	18		Electrofishing	Largemouth Bass	117	22
2005	September	18		Electrofishing	Largemouth Bass	97	12
2005	September	18		Electrofishing	Largemouth Bass	106	12

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	15	E	Electrofishing	Largemouth Bass	89	4
2005	September	15	E	Electrofishing	Largemouth Bass	106	12
2005	September	15	E	Electrofishing	Largemouth Bass	108	12
2005	September	15	E	Electrofishing	Largemouth Bass	111	14
2005	September	15	E	Electrofishing	Largemouth Bass	96	8
2005	September	15	E	Electrofishing	Largemouth Bass	100	12
2005	September	15	W	Electrofishing	Largemouth Bass	101	18
2005	September	15	W	Electrofishing	Largemouth Bass	123	26
2005	September	15	W	Electrofishing	Largemouth Bass	114	20
2005	September	15	W	Electrofishing	Largemouth Bass	97	16
2005	September	15	W	Electrofishing	Largemouth Bass	120	24
2005	September	15	W	Electrofishing	Largemouth Bass	128	26
2005	September	15	W	Electrofishing	Largemouth Bass	123	20
2005	September	14	E	Electrofishing	Largemouth Bass	442	1350
2005	September	14	E	Electrofishing	Largemouth Bass	505	2400
2005	September	14	E	Electrofishing	Largemouth Bass	297	1000
2005	September	14	E	Electrofishing	Largemouth Bass	91	12
2005	September	14	E	Electrofishing	Largemouth Bass	105	15
2005	September	14	W	Electrofishing	Largemouth Bass	145	40
2005	September	14	W	Electrofishing	Largemouth Bass	133	30
2005	September	14	W	Electrofishing	Largemouth Bass	95	14
2005	September	14	W	Electrofishing	Largemouth Bass	92	14
2005	September	14	W	Electrofishing	Largemouth Bass	106	18
2005	September	14	W	Electrofishing	Largemouth Bass	95	16
2005	September	14	W	Electrofishing	Largemouth Bass	86	10
2005	September	14	W	Electrofishing	Largemouth Bass	82	8
2005	September	14	W	Electrofishing	Largemouth Bass	95	12
2005	September	13	W	Electrofishing	Largemouth Bass	128	22
2005	September	13	E	Electrofishing	Largemouth Bass	91	14
2005	September	16		Electrofishing	Largemouth Bass	88	8
2005	September	11	W	Electrofishing	Pumpkinseed	95	18
2005	September	12	W	Electrofishing	Pumpkinseed	82	4
2005	September	18		Electrofishing	Pumpkinseed	106	25
2005	September	18		Electrofishing	Pumpkinseed	118	26
2005	September	18		Electrofishing	Pumpkinseed	101	18
2005	September	15	E	Electrofishing	Pumpkinseed	134	42
2005	September	14	E	Electrofishing	Pumpkinseed	108	22
2005	September	14	W	Electrofishing	Pumpkinseed	115	30

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	13	E	Electrofishing	Pumpkinseed	90	14
2005	September	13	E	Electrofishing	Pumpkinseed	98	22
2005	September	12	W	Electrofishing	Redbreast Sunfish	116	38
2005	September	12	W	Electrofishing	Redbreast Sunfish	125	34
2005	September	12	W	Electrofishing	Redbreast Sunfish	100	20
2005	September	12	W	Electrofishing	Redbreast Sunfish	98	15
2005	September	12	W	Electrofishing	Redbreast Sunfish	90	12
2005	September	12	W	Electrofishing	Redbreast Sunfish	90	32
2005	September	12	W	Electrofishing	Redbreast Sunfish	117	38
2005	September	12	W	Electrofishing	Redbreast Sunfish	120	38
2005	September	12	W	Electrofishing	Redbreast Sunfish	95	14
2005	September	12	W	Electrofishing	Redbreast Sunfish	242	364
2005	September	12	E	Electrofishing	Redbreast Sunfish	110	20
2005	September	15	E	Electrofishing	Redbreast Sunfish	164	98
2005	September	15	E	Electrofishing	Redbreast Sunfish	140	56
2005	September	15	W	Electrofishing	Redbreast Sunfish	88	14
2005	September	15	W	Electrofishing	Redbreast Sunfish	86	12
2005	September	14	W	Electrofishing	Redbreast Sunfish	149	58
2005	September	14	W	Electrofishing	Redbreast Sunfish	90	12
2005	September	13	W	Electrofishing	Redbreast Sunfish	123	36
2005	September	13	E	Electrofishing	Redbreast Sunfish	115	28
2005	September	12	W	Electrofishing	Rock Bass	105	25
2005	September	18		Electrofishing	Rock Bass	170	108
2005	September	11	E	Electrofishing	Smallmouth Bass	85	10
2005	September	12	W	Electrofishing	Smallmouth Bass	105	10
2005	September	12	W	Electrofishing	Smallmouth Bass	132	20
2005	September	12	W	Electrofishing	Smallmouth Bass	62	3
2005	September	12	E	Electrofishing	Smallmouth Bass	136	32
2005	September	18		Electrofishing	Smallmouth Bass	106	14
2005	September	18		Electrofishing	Smallmouth Bass	126	30
2005	September	15	E	Electrofishing	Smallmouth Bass	118	14
2005	September	15	E	Electrofishing	Smallmouth Bass	110	22
2005	September	15	W	Electrofishing	Smallmouth Bass	138	34
2005	September	15	W	Electrofishing	Smallmouth Bass	164	52
2005	September	14	E	Electrofishing	Smallmouth Bass	130	28
2005	September	14	E	Electrofishing	Smallmouth Bass	470	1850
2005	September	14	E	Electrofishing	Smallmouth Bass	455	1500
2005	September	14	W	Electrofishing	Smallmouth Bass	119	22

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	14	W	Electrofishing	Smallmouth Bass	139	38
2005	September	14	W	Electrofishing	Smallmouth Bass	112	18
2005	September	13	W	Electrofishing	Smallmouth Bass	450	1250
2005	September	13	W	Electrofishing	Smallmouth Bass	110	14
2005	September	13	W	Electrofishing	Smallmouth Bass	138	28
2005	September	13	W	Electrofishing	Smallmouth Bass	133	24
2005	September	13	W	Electrofishing	Smallmouth Bass	110	16
2005	September	17		Electrofishing	Smallmouth Bass	111	14
2005	September	11	E	Electrofishing	Spottail Shiner	55	1
2005	September	11	E	Electrofishing	Spottail Shiner	63	1
2005	September	11	E	Electrofishing	Spottail Shiner	64	1
2005	September	11	E	Electrofishing	Spottail Shiner	57	1
2005	September	11	E	Electrofishing	Spottail Shiner	53	1
2005	September	11	E	Electrofishing	Spottail Shiner	66	1
2005	September	11	E	Electrofishing	Spottail Shiner	66	1
2005	September	12	E	Electrofishing	Spottail Shiner	86	3
2005	September	12	E	Electrofishing	Spottail Shiner	71	2
2005	September	12	E	Electrofishing	Spottail Shiner	131	32
2005	September	12	E	Electrofishing	Spottail Shiner	126	18
2005	September	12	E	Electrofishing	Spottail Shiner	120	18
2005	September	12	E	Electrofishing	Spottail Shiner	121	15
2005	September	12	E	Electrofishing	Spottail Shiner	125	18
2005	September	12	E	Electrofishing	Spottail Shiner	135	22
2005	September	11	W	Electrofishing	Yellow Perch	100	12
2005	September	11	W	Electrofishing	Yellow Perch	116	18
2005	September	11	W	Electrofishing	Yellow Perch	112	15
2005	September	11	W	Electrofishing	Yellow Perch	100	11
2005	September	11	W	Electrofishing	Yellow Perch	131	21
2005	September	11	W	Electrofishing	Yellow Perch	107	15
2005	September	11	W	Electrofishing	Yellow Perch	115	20
2005	September	11	W	Electrofishing	Yellow Perch	107	15
2005	September	11	W	Electrofishing	Yellow Perch	101	15
2005	September	11	W	Electrofishing	Yellow Perch	102	18
2005	September	11	W	Electrofishing	Yellow Perch	106	18
2005	September	11	W	Electrofishing	Yellow Perch	116	19
2005	September	11	W	Electrofishing	Yellow Perch	119	20
2005	September	11	W	Electrofishing	Yellow Perch	114	18
2005	September	11	W	Electrofishing	Yellow Perch	102	20

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	September	11	W	Electrofishing	Yellow Perch	109	18
2005	September	11	W	Electrofishing	Yellow Perch	110	18
2005	September	11	W	Electrofishing	Yellow Perch	116	21
2005	September	11	W	Electrofishing	Yellow Perch	116	16
2005	September	11	W	Electrofishing	Yellow Perch	115	15
2005	September	11	W	Electrofishing	Yellow Perch	107	6
2005	September	12	W	Electrofishing	Yellow Perch	110	6
2005	September	12	E	Electrofishing	Yellow Perch	106	12
2005	September	12	E	Electrofishing	Yellow Perch	104	14
2005	September	12	E	Electrofishing	Yellow Perch	115	20
2005	September	12	E	Electrofishing	Yellow Perch	129	32
2005	September	12	E	Electrofishing	Yellow Perch	125	19
2005	September	12	E	Electrofishing	Yellow Perch	126	24
2005	September	14	E	Electrofishing	Yellow Perch	110	18
2005	September	14	W	Electrofishing	Yellow Perch	120	20
2005	September	13	E	Electrofishing	Yellow Perch	208	114
2005	September	13	E	Electrofishing	Yellow Perch	230	152
2005	November	18		Electrofishing	Black Crappie	148	40
2005	November	18		Electrofishing	Bluegill	133	43
2005	November	18		Electrofishing	Bluegill	115	30
2005	November	18		Electrofishing	Bluegill	108	25
2005	November	18		Electrofishing	Bluegill	119	30
2005	November	18		Electrofishing	Bluegill	118	30
2005	November	18		Electrofishing	Bluegill	118	35
2005	November	18		Electrofishing	Bluegill	120	35
2005	November	18		Electrofishing	Bluegill	125	40
2005	November	18		Electrofishing	Bluegill	120	38
2005	November	18		Electrofishing	Chain Pickerel	347	238
2005	November	18		Electrofishing	Chain Pickerel	320	200
2005	November	18		Electrofishing	Chain Pickerel	306	160
2005	November	14	W	Electrofishing	Fallfish	70	
2005	November	14	W	Electrofishing	Fallfish	70	
2005	November	14	W	Electrofishing	Fallfish	60	
2005	November	14	W	Electrofishing	Fallfish	62	
2005	November	14	W	Electrofishing	Fallfish	65	
2005	November	14	W	Electrofishing	Fallfish	58	
2005	November	14	W	Electrofishing	Fallfish	58	
2005	November	14	W	Electrofishing	Fallfish	54	

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	November	14	W	Electrofishing	Fallfish	59	1
2005	November	14	W	Electrofishing	Fallfish	56	1
2005	November	14	W	Electrofishing	Fallfish	59	1
2005	November	14	W	Electrofishing	Fallfish	56	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	59	1
2005	November	14	W	Electrofishing	Fallfish	40	1
2005	November	14	W	Electrofishing	Fallfish	58	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	63	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	59	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	60	1
2005	November	14	W	Electrofishing	Fallfish	58	1
2005	November	14	W	Electrofishing	Fallfish	59	1
2005	November	14	W	Electrofishing	Fallfish	59	1
2005	November	14	W	Electrofishing	Fallfish	63	1
2005	November	14	W	Electrofishing	Fallfish	59	1
2005	November	14	W	Electrofishing	Fallfish	58	1
2005	November	14	W	Electrofishing	Fallfish	38	1
2005	November	14	W	Electrofishing	Fallfish	39	1
2005	November	14	W	Electrofishing	Fallfish	59	1
2005	November	14	W	Electrofishing	Fallfish	66	1
2005	November	14	W	Electrofishing	Fallfish	58	1
2005	November	14	W	Electrofishing	Fallfish	67	1
2005	November	14	W	Electrofishing	Fallfish	62	1
2005	November	14	W	Electrofishing	Fallfish	62	1
2005	November	14	W	Electrofishing	Fallfish	67	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	56	1
2005	November	14	W	Electrofishing	Fallfish	66	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	40	1
2005	November	14	W	Electrofishing	Fallfish	60	1
2005	November	14	W	Electrofishing	Fallfish	57	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish	63	1
2005	November	14	W	Electrofishing	Fallfish	56	1
2005	November	14	W	Electrofishing	Fallfish	57	1
2005	November	14	W	Electrofishing	Fallfish		
2005	November	18		Electrofishing	Golden Shiner	145	35
2005	November	18		Electrofishing	Golden Shiner	128	25
2005	November	17		Electrofishing	Largemouth Bass	474	1750
2005	November	16		Electrofishing	Largemouth Bass	482	2000
2005	November	16		Electrofishing	Largemouth Bass	574	3000
2005	November	18		Electrofishing	Largemouth Bass	169	60
2005	November	18		Electrofishing	Largemouth Bass	215	135
2005	November	18		Electrofishing	Largemouth Bass	183	85
2005	November	18		Electrofishing	Pumpkinseed	124	35
2005	November	17		Electrofishing	Smallmouth Bass	380	700
2005	November	17		Electrofishing	Smallmouth Bass	387	760
2005	November	16		Electrofishing	Smallmouth Bass	208	100
2005	November	14	W	Electrofishing	Spottail Shiner	56	
2005	November	14	W	Electrofishing	Spottail Shiner	60	
2005	November	14	W	Electrofishing	Spottail Shiner	58	
2005	November	14	W	Electrofishing	Spottail Shiner	60	
2005	November	14	W	Electrofishing	Spottail Shiner	60	
2005	November	14	W	Electrofishing	Spottail Shiner	58	
2005	November	14	W	Electrofishing	Spottail Shiner	57	
2005	November	14	W	Electrofishing	Spottail Shiner	57	
2005	November	14	W	Electrofishing	Spottail Shiner	58	
2005	November	14	W	Electrofishing	Spottail Shiner	62	
2005	November	14	W	Electrofishing	Spottail Shiner	56	1
2005	November	14	W	Electrofishing	Spottail Shiner	40	1
2005	November	14	W	Electrofishing	Spottail Shiner	37	1
2005	November	14	W	Electrofishing	Spottail Shiner	37	1
2005	November	14	W	Electrofishing	Spottail Shiner	57	1
2005	November	14	W	Electrofishing	Spottail Shiner	62	1
2005	November	14	W	Electrofishing	Spottail Shiner	62	1
2005	November	14	W	Electrofishing	White Perch	83	3
2005	November	18		Electrofishing	White Sucker	250	180
2005	November	18		Electrofishing	Yellow Perch	144	40
2005	November	18		Electrofishing	Yellow Perch	144	42

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	December	17		Electrofishing	Atlantic Salmon	639	2175
2005	December	18		Electrofishing	Bluegill	136	48
2005	December	16		Electrofishing	Bluegill	160	175
2005	December	16		Electrofishing	Chain Pickerel	308	165
2005	December	18		Electrofishing	Golden Shiner	157	44
2005	December	14	W	Electrofishing	Golden Shiner	85	4
2005	December	14	W	Electrofishing	Golden Shiner	72	2
2005	December	14	W	Electrofishing	Golden Shiner	65	2
2005	December	14	W	Electrofishing	Golden Shiner	76	3
2005	December	14	W	Electrofishing	Golden Shiner	72	4
2005	December	18		Electrofishing	Largemouth Bass	134	38
2005	December	16		Electrofishing	Largemouth Bass	113	16
2005	December	16		Electrofishing	Largemouth Bass	198	95
2005	December	11	W	Electrofishing	Spottail Shiner	68	1
2005	December	18		Electrofishing	Spottail Shiner	117	15
2005	December	14	W	Electrofishing	Spottail Shiner	112	10
2005	December	14	W	Electrofishing	Spottail Shiner	107	8
2005	December	14	W	Electrofishing	Spottail Shiner	65	2
2005	December	14	W	Electrofishing	Spottail Shiner	110	7
2005	December	14	W	Electrofishing	Spottail Shiner	72	2
2005	December	14	W	Electrofishing	Spottail Shiner	75	3
2005	December	14	W	Electrofishing	Spottail Shiner	68	2
2005	December	14	W	Electrofishing	Spottail Shiner	70	2
2005	December	14	W	Electrofishing	Spottail Shiner	62	2
2005	December	14	W	Electrofishing	Spottail Shiner	40	1
2005	December	14	W	Electrofishing	Spottail Shiner	35	1
2005	December	14	W	Electrofishing	Spottail Shiner	66	2
2005	December	14	W	Electrofishing	Spottail Shiner	40	1
2005	December	14	W	Electrofishing	Spottail Shiner	35	1
2005	December	14	W	Electrofishing	Spottail Shiner	35	1
2005	December	14	W	Electrofishing	Spottail Shiner	37	1
2005	December	14	W	Electrofishing	Spottail Shiner	32	1
2005	December	14	W	Electrofishing	Spottail Shiner	40	1
2005	December	14	W	Electrofishing	Spottail Shiner	55	2
2005	December	14	W	Electrofishing	Spottail Shiner	38	1
2005	December	14	W	Electrofishing	Spottail Shiner	35	1
2005	December	14	W	Electrofishing	Spottail Shiner	35	1
2005	December	14	W	Electrofishing	Spottail Shiner	35	1

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	December	14	W	Electrofishing	Spottail Shiner	32	1
2005	December	14	W	Electrofishing	Spottail Shiner	35	1
2005	December	14	W	Electrofishing	Spottail Shiner	32	1
2005	December	14	E	Electrofishing	Spottail Shiner	72	2
2005	December	18		Electrofishing	White Perch	194	104
2005	December	18		Electrofishing	White Sucker	274	208
2005	December	18		Electrofishing	White Sucker	260	188
2005	December	18		Electrofishing	White Sucker	241	150
2005	December	18		Electrofishing	White Sucker	304	296
2005	December	18		Electrofishing	Yellow Perch	242	180
2005	December	18		Electrofishing	Yellow Perch	197	98
2005	December	18		Electrofishing	Yellow Perch	268	90
2005	December	18		Electrofishing	Yellow Perch	197	90
2005	December	18		Electrofishing	Yellow Perch	207	94
2005	December	18		Electrofishing	Yellow Perch	188	75
2005	December	18		Electrofishing	Yellow Perch	185	70
2005	December	18		Electrofishing	Yellow Perch	183	55
2005	December	18		Electrofishing	Yellow Perch	191	75
2005	December	18		Electrofishing	Yellow Perch	131	25
2005	December	18		Electrofishing	Yellow Perch	123	20
2005	December	18		Electrofishing	Yellow Perch	151	34
2005	December	18		Electrofishing	Yellow Perch	131	30
2005	December	18		Electrofishing	Yellow Perch	177	60
2005	December	18		Electrofishing	Yellow Perch	122	25
2005	December	18		Electrofishing	Yellow Perch	130	22
2005	December	18		Electrofishing	Yellow Perch	135	32
2005	December	18		Electrofishing	Yellow Perch	105	15
2005	December	18		Electrofishing	Yellow Perch	130	28
2005	December	18		Electrofishing	Yellow Perch	123	20
2005	December	18		Electrofishing	Yellow Perch	125	22
2005	December	18		Electrofishing	Yellow Perch	107	14
2005	December	18		Electrofishing	Yellow Perch	126	25
2005	December	18		Electrofishing	Yellow Perch	182	65
2005	December	18		Electrofishing	Yellow Perch	134	32
2005	December	18		Electrofishing	Yellow Perch	112	18
2005	December	18		Electrofishing	Yellow Perch	115	20
2005	December	18		Electrofishing	Yellow Perch	130	25
2005	December	18		Electrofishing	Yellow Perch	128	28

Year	Month	Station	Site	Method	Species	Total Length (mm)	Wet Weight (g)
2005	December	18		Electrofishing	Yellow Perch	188	80
2005	December	18		Electrofishing	Yellow Perch	122	28
2005	December	18		Electrofishing	Yellow Perch	125	30
2005	December	18		Electrofishing	Yellow Perch	134	30
2005	December	18		Electrofishing	Yellow Perch	128	30
2005	December	18		Electrofishing	Yellow Perch	110	18
2005	December	16		Electrofishing	Yellow Perch	181	68
2005	December	14	W	Electrofishing	Yellow Perch	178	52