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KYGER CREEK STATION
FISH IMPINGEMENT AND ENTRAINMENT STUDIES

PREPARED FOR

AMERICAN ELECTRIC POWER SERVICE CORPORATION

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INTRODUCTION

Ohio Valley Electric Corporation contracted NUS Corporation in March 1978 to conduct a fish impingement and ichthyoplankton entrainment sampling program at the Kyger Creek Station. The Kyger Creek Station is located at river mile 260 of the Ohio River, 2.4 mi downstream of Cheshire, West Virginia, in Gallia County, Ohio. The plant, consists of five coal fired units with a nominal generating capacity of 1,085 MW.

The purpose of the impingement and entrainment studies was to provide sufficient data to allow estimation of the total annual fish impingement and fish eggs and larvae entrainment at the station. The results of these efforts are reported herein.

METHODS

IMPINGEMENT

Weekly impingement collections (28-hr surveys) were initiated on April 10, 1978 and continued through October 24, 1978. Biweekly collections were started on November 6, 1978 and continued to March 20, 1979 after which weekly collections were again started and continued through April 3, 1979. Plant personnel were contacted to rotate and clean the traveling screens prior to and at 4-hr intervals during each 28-hr survey. After the initial cleaning, a fish collection basket was placed at the lower end of the screen wash trash trough where debris normally drops into the discharge. Mesh size of the collection basket was 0.375 inch square.

After each 4-hr collection, all fishes were sorted from the debris and immediately categorized into three groups: (1) live; (2) dead; and (3) obviously dead prior to impingement. Obviously dead fish were differentiated on the basis of advanced stages of decomposition and were not included in data base used to estimate annual impingement. Numbers of fishes in categories one and two are reported in Table 1 of Appendix A; fish in category three are reported in Table 2 of Appendix A. Each specimen was identified to the lowest feasible taxon, usually species. Total length (mm) and

6

and weight were measured on all specimens except when more than 30 specimens per species per 4-hr period were collected. Subsampling was performed when more than 30 specimens per specimens per species were collected per 4-hr period. Fish excluded from the subsamples were weighed as a group to provide a bulk weight. A voucher collection was developed and all species identifications were confirmed in the laboratory.

An estimate of the number and biomass of fish impinged per year at the Kyger Creek Station was made by multiplying the average number of fish impinged during the first 24 hr of each 28-hr study times 365 days per year. Ninety five percent confidence limits for the estimated number of fish impinged per year based on the average per 24 hr were calculated using the t-distribution of Snedecor and Cochran (1967).

ENTRAINMENT

Ichthyoplankton was sampled weekly from March 13, 1978 through August 31, 1978, twice monthly in September and October and monthly November through February, 1978-1979. Samples were taken from taps off one circulating water pump of each operating unit. Each sample consisted of a 24-hr continuous sample for each unit. The volume of water sampled generally

exceeded 100 m^3 to minimize the problem of non-random sampling of large volumes of cooling water.

Intake water was "tapped" from a circulating water pump through existing valves, through a one inch (I.D.) hose and into a 0.5 m diameter 0.505 mm mesh net suspended in a 55 gal drum (Figure 1). Originally, a second net was placed around the 0.5 m net to prevent sample loss in the event of clogging and over-flowing. The use of the second net was found to be unnecessary and was discontinued. Each net was tended at approximately 6-hr intervals and a sample removed and preserved. Sample volume was determined at 3-hr intervals through use of a General Oceanics Model 2030 flow meter placed in-line on the discharge from the 55 gal drum and verified with time-volume measurements from the discharge pipe (Figure 1).

Samples were preserved in 5% buffered formalin and stained with rose bengal dye. Each sample was sorted in the laboratory and specimens identified to the lowest feasible taxa. Approximately 5% of the samples were resorted yielding a sorting accuracy of 97%. Samples from September through February were taken, but at the request of American Electric Power (AEP) were not analyzed.

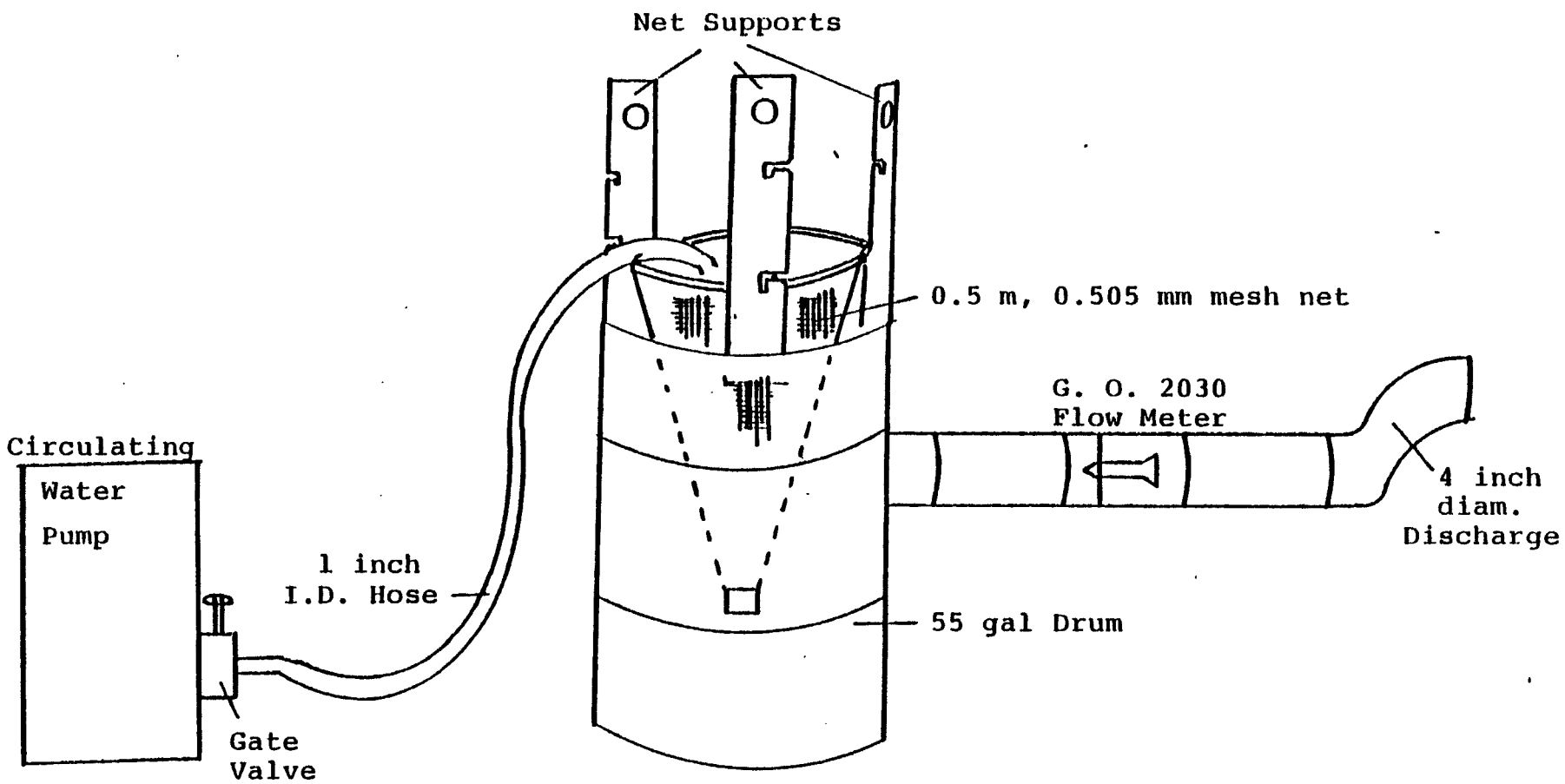

FIGURE 1

ICHTHYOPLANKTON SAMPLING APPARATUS

Estimates of ichthyoplankton abundance were calculated using the following formulae adapted from Potter et al. (In press): Total 24-hr estimates (E_{24}) were made using the following formula:

$$E_{24} = \sum_{u=1}^{5} \sum_{t=1}^{n} (4527.4)(P_u)(T_t)$$

where 4527.4 = number of 100 m^3 volume units through each pump per 24 hr

P_u = number of pumps operating in each unit

T_t = The number of specimens of each taxon per 100 m^3

u = The different power station units

t= The different taxa collected

Estimates of numbers of ichthyoplankton entrained per month (E_{mo}) were calculated using the following formula:

$$E_{mo} = \sum_{e=1}^{m} \sum_{t=1}^{n} d(T_{24})$$

where

d = Number of days represented by a 24-hr estimate

T_{24} = The estimated number of each taxon entrained per 24 hr

e = The number of 24-hr estimates per month

t = The different taxa collected

The total estimated number of ichthyoplankton entrained by the Kyger Creek Station (E_{tot}) was the sum of the month estimates:

$$E_{tot} = \sum_{i=1}^{n} E_{mo}$$

where

E_{mo} = The estimated number of ichthyoplankton entrained per month

i = The months estimates were made

To make the above estimates of entrainment, it was assumed that the densities and composition of ichthyoplankton entrained per 24 hr were the same for all days represented by single estimates. In addition, it was assumed that no ichthyoplankton were entrained from September through February.

PLANT OPERATING AND FIELD DATA

Intake and discharge temperatures were obtained at 4-hr intervals from plant instruments. Temperature readings were instantaneous readings, therefore, these readings cannot be related to those contained in NPDES monitoring reports. Air temperature, barometric pressure (in. of Hg), wind direction, speed, and percent cloud data were also

obtained at 4-hr intervals by the field crew. In addition, the Plant Manager was contacted to obtain records of unit outages and the chlorination schedule during the course of the impingement and entrainment survey.

The number of operating circulating water pumps was determined for each entrainment and impingement sampling period to allow estimation of daily circulating water volume.

Current speed measurements were taken in front of the traveling screens during April, May, June, July, August and September 1978 and July 1979. On July 12, 1979 an extensive survey was conducted to collect current speed and direction data in the river in front of the Kyger Creek Station intake structure. These data are presented in Appendix D.

RESULTS

IMPINGEMENT

CATCH COMPOSITION

Data from a total of 41 impingement surveys from April 1978 through early April 1979 are presented in Tables 1 and 2 of Appendix A. These data are summarized and reported in this section.

A total of 23,929 fish representing 38 species, plus 8 other taxa was impinged during the survey period (Table 1). A species list of fishes collected in both impingement and entrainment studies is presented in Table 2. Total weight of all fish impinged was approximately 279.4 kg (Table 1). Four species, the gizzard shad (71.6% of total number, freshwater drum (14.0%), emerald shiner (5.8%) and channel catfish (2.6%) accounted for 94.0% of the total number of fish collected. Five species represented 88.2% of the collected biomass; gizzard shad (53.5% of total weight), sauger (16.8%), freshwater drum (12.6%), channel catfish (3.1%), and white bass (2.2%).

None of the fishes collected from the Kyger Creek Station intake screens are included in the Federal list of threatened or endangered wildlife (U.S. Fish and Wildlife Service 1979). Two fish, mooneye and silver chub, however, are included in the official Ohio list (Ohio Department of Natural Resources undated).

TABLE 1

NUMBER AND WEIGHT OF FISHES IN 28-HR IMPINGEMENT COLLECTIONS AT THE KYGER CREEK STATION. NUMBERS IN PARENTHESES REPRESENT ESTIMATES BASED ON SUBSAMPLES OF 4-HR PERIODS.

	April 10-11		April 17-18		April 24-25		May 1-2		May 8-9		May 15-16		May 22-23	
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)
Longnose gar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Skipjack herring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gizzard shad	-	-	-	-	6	85	-	-	-	-	2	34	-	-
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mooneye	1	23	8	199	2	60	1	21	-	-	2	56	1	38
Northern pike	-	-	1	92	-	-	-	-	-	-	-	-	2	33
Carp	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver chub	-	-	-	-	-	-	-	-	-	-	-	-	1	8
Golden shiner	-	-	-	-	1	10	-	-	2	10	4	24	-	-
Emerald shiner	-	-	8	44	5	49	5	34	33	198	54	322	40	248
Mimic shiner	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bluntnose minnow	-	-	-	-	-	-	1	6	-	-	-	-	-	-
Creek chub	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
River carpsucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quillback	-	-	-	-	-	-	-	-	2	9	3	37	9	132
White sucker	-	-	-	-	-	-	-	-	-	-	1	8	-	-
Spotted sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Golden redhorse	-	-	-	-	1	486	1	5	-	-	-	-	1	16
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (Moxostoma)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brown bullhead	-	-	-	-	-	-	-	-	-	-	1	22	-	-
Channel catfish	5	266	-	-	-	-	4	117	4	217	9	492	8	108
Catfish (Ictalurus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flathead catfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White bass	-	-	6	850	1	80	-	-	1	92	1	38	-	-
Rock bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	1	20
Pumpkinseed	-	-	-	-	-	-	-	-	1	31	1	4	-	-
Warmouth	-	-	2	80	2	225	-	-	8	338	2	7	5	455
Bluegill	-	-	3	77	5	29	5	167	7	100	22	415	25	852
Longear sunfish	-	-	-	-	-	-	3	227	1	34	1	12	1	76
Sunfish (Lepomis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Smallmouth bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Largemouth bass	-	-	-	-	-	-	-	-	1	395	1	64	-	-
Sunfish (Micropterus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White crappie	6	518	1	18	1	8	-	-	-	-	-	-	10	383
Black crappie	1	5	5	576	2	403	2	224	3	1,019	-	-	2	44
Crappie (Pomoxis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Centrarchidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	1	119	1	184	1	61	-	-	1	7
Logperch	2	8	-	-	-	-	2	10	2	11	1	7	-	-
Sauger	10	730	23	4,301	17	2,647	24	5,596	13	1,568	16	1,063	66	5,751
Walleye	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freshwater drum	15	1,621	23	1,237	11	464	1	55	10	392	11	176	28	1,223
Total	40	3,171	80	7,474	55	4,885	50	6,646	89	4,478	132	2,601	201	9,394

TABLE 1 (Continued)

	May 29-30		June 5-6		June12-13		June 19-20		June 26-27		July 3-4		July 10-11	
	No.	Wt.(g)	No.	Wt.(g)	No.	Wt.(g)	No.	Wt.(g)	No.	Wt.(g)	No.	Wt.(g)	No.	Wt.(g)
Longnose gar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Skipjack herring	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-	6	17
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	5	15	-	-
Mooneye	5	137	-	-	-	-	-	-	-	-	1	1	-	-
Northern pike	-	-	-	-	1	12	-	-	-	-	1	24	-	-
Carp	2	49	-	-	-	-	-	-	-	-	-	-	-	-
Silver chub	1	32	-	-	-	-	-	-	-	-	1	11	1	19
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emerald shiner	19	80	3	15	6	34	4	13	3	18	19	49	1	15
Mimic shiner	-	-	-	-	-	-	-	-	-	-	3	10	1	4
Bluntnose minnow	-	-	-	-	1	8	-	-	-	-	-	-	-	-
Creek chub	-	-	-	-	1	22	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	-	-	-	-	-	-	-	-	-	-	2	2	-	-
River carpsucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quillback	2	583	-	-	-	-	-	-	-	-	-	-	-	-
White sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spotted sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Golden redhorse	-	-	-	-	2	13	-	-	-	-	7	39	1	8
Shorthead redhorse	1	9	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (Moxostoma)	1	13	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brown bullhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	2	16	2	29	-	-	-	-	1	12	1	283	-	-
Catfish (Ictalurus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flathead catfish	-	-	-	-	-	-	-	-	-	-	-	-	1	141
White bass	4	186	-	-	-	-	2	155	-	-	-	-	1	575
Rock bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Warmouth	3	175	2	79	-	-	1	37	-	-	1	62	-	-
Bluegill	10	337	-	-	6	80	1	7	-	-	1	4	3	126
Longear sunfish	3	191	4	236	1	54	1	20	-	-	-	-	1	47
Sunfish (Lepomis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Smallmouth bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Largemouth bass	-	-	-	-	1	74	-	-	-	-	-	-	-	-
Sunfish (Micropterus)	-	-	-	-	-	-	-	-	-	-	1	1	-	-
White crappie	1	30	-	-	-	-	-	-	-	-	3	3	5	5
Black crappie	-	-	-	-	-	-	-	-	-	-	1	1	1	1
Crappie (Pomoxis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Centrarchidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	1	15	-	-	-	-	2	23	-	-
Logperch	1	6	-	-	1	6	-	-	-	-	-	-	-	-
Sauger	53	10,784	10	2,963	8	1,763	1	82	1	29	9	463	2	600
Walleye	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freshwater drum	4	384	1	64	1	48	-	-	-	-	-	-	-	-
Total	112	12,012	22	3,386	30	2,129	10	314	5	59	50	991	24	1,548

TABLE 1 (Continued)

	July 17-18		July 24-25		July 31-Aug 1		Aug. 7-8		Aug. 14-15		Aug. 21-22		Aug. 28-29	
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)
Longnose gar	1	11	-	-	-	-	-	-	-	-	-	-	1	39
Skipjack herring	-	-	-	-	-	-	-	-	2	16	-	-	-	-
Gizzard shad	104	269	81	441	398	1,701	1,188	3,578	10,771	33,696	1,056	2,417	16	51
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mooneye	-	-	-	-	1	72	-	-	1	6	-	-	-	-
Northern pike	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carp	3	10	-	-	-	-	3	1,027	1	134	-	-	-	-
Silver chub	-	-	-	-	2	41	4	78	2	18	-	-	2	30
Golden shiner	-	-	-	-	-	-	-	-	1	12	-	-	-	-
Emerald shiner	2	8	9	32	4	12	11	32	43	125	37	120	3	3
Mimic shiner	3	11	1	1	-	-	5	5	-	-	2	5	1	3
Bluntnose minnow	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Creek chub	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
River carpsucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quillback	-	-	2	5	-	-	-	-	3	10	-	-	-	-
White sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spotted sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver redhorse	-	-	-	-	-	-	1	10	-	-	-	-	-	-
Golden redhorse	1	9	1	5	-	-	-	-	1	2	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (Moxostoma)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brown bullhead	-	-	1	1	1	14	-	-	-	-	1	222	-	-
Channel catfish	7	13	32	58	33	49	47	104	50	702	120	744	23	95
Catfish (Ictalurus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flathead catfish	-	-	4	8	10	20	7	21	11	58	9	51	-	-
White bass	-	-	2	12	1	334	4	134	2	31	-	-	-	-
Rock bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Warmouth	-	-	-	-	-	-	1	4	-	-	-	-	-	-
Bluegill	3	159	1	57	2	69	-	-	13	24	-	-	12	21
Longear sunfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Lepomis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Smallmouth bass	-	-	-	-	-	-	2	5	-	-	-	-	-	-
Largemouth bass	-	-	-	-	-	-	-	-	2	12	-	-	-	-
Sunfish (Micropterus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White crappie	3	3	4	7	13	20	42	60	49	107	3	12	2	13
Black crappie	3	3	1	2	2	2	10	15	16	38	1	48	-	-
Crappie (Pomoxis)	-	-	1	1	-	-	1	1	3	6	-	-	-	-
Sunfish (Centrarchidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logperch	-	-	-	-	1	4	-	-	1	8	-	-	-	-
Sauger	2	7	3	142	2	12	2	22	20	861	2	131	-	-
Walleye	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freshwater drum	11	95	46	84	493	1,967	371	926	155	742	15	57	26	153
Total	143	598	189	856	963	4,317	1,699	6,022	11,147	36,608	1,246	3,807	86	408

TABLE 1 (Continued)

	Sept. 4-5		Sept. 11-12		Sept. 18-19		Sept. 25-26		Oct. 2-3		Oct. 9-10		Oct. 16-17	
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)
Longnose gar	-	-	-	-	-	-	-	-	-	-	-	-	2	204
Skipjack herring	1	12	2	25	1	16	-	-	2	208	2	208	2	227
Gizzard shad	83	543	18	221	2	29	19	534	23	985	28	1,141	56	247
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mooneye	-	-	1	267	-	-	-	-	-	-	-	-	-	-
Northern pike	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carp	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver chub	9	91	7	59	9	34	3	59	4	9	-	-	8	85
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emerald shiner	45	115	208	443	48	116	71	152	94	311	203	655	207	643
Mimic shiner	7	20	12	25	-	-	1	1	-	-	-	-	-	-
Bluntnose minnow	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Creek chub	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	-	-	14	28	2	4	7	14	-	-	12	24	1	2
River carpsucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quillback	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spotted sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Golden redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (Moxostoma)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brown bullhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	47	179	56	654	64	1,074	13	138	18	807	17	689	19	1,186
Catfish (Ictalurus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flathead catfish	1	3	7	123	3	71	2	45	1	56	-	-	-	-
White bass	-	-	-	-	-	-	-	-	-	-	-	-	2	239
Rock bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Warmouth	-	-	-	-	-	-	-	-	-	-	-	-	1	5
Bluegill	8	29	4	10	1	3	1	132	3	16	1	8	11	201
Longear sunfish	-	-	-	-	-	-	1	74	-	-	-	-	-	-
Sunfish (Lepomis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Smallmouth bass	1	1	-	-	-	-	-	-	-	-	-	-	-	-
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	-	1	18
Sunfish (Micropterus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White crappie	7	22	1	3	-	-	1	3	2	6	-	-	3	12
Black crappie	4	10	1	3	-	-	2	8	-	-	-	-	1	10
Crappie (Pomoxis)	-	-	2	10	-	-	-	-	-	-	-	-	-	-
Sunfish (Centrarchidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Logperch	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sauger	-	-	2	528	-	-	-	-	-	-	-	-	1	186
Walleye	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freshwater drum	99	402	109	784	47	326	25	106	21	210	107	1,354	244	1,001
Total	312	1,427	444	3,183	177	1,673	146	1,266	168	2,608	170	4,079	559	6,236

TABLE 1 (CONTINUED)

	Oct. 23-24		Nov. 6-7		Nov. 20-21		Dec. 4-5		Dec. 18-19		Jan. 8-9		Jan. 22-23	
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)
Longnose gar	1	150	-	-	-	-	-	-	1	122	-	-	-	-
Skipjack herring	2	251	1	191	-	-	-	-	-	-	-	-	-	-
Gizzard shad	53	1,311	188	5,520	183	3,567	740	13,081	1,266	27,251	65	1,736	76	3,607
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mooneye	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northern pike	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carp	-	-	-	-	2	2,486	-	-	5	1,199	-	-	-	-
Silver chub	-	-	2	12	-	-	1	4	2	11	-	-	-	-
Golden shiner	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emerald shiner	20	54	4	11	18	54	40	203	25	103	5	26	-	-
Mimic shiner	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bluntnose minnow	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Creek chub	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	1	6	1	2	1	4	-	-	1	2	-	-	-	-
River carpsucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Quillback	1	8	-	-	-	-	1	9	1	22	-	-	-	-
White sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Spotted sucker	-	-	-	-	-	-	-	-	1	24	-	-	-	-
Silver redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Golden redhorse	-	-	-	-	-	-	1	6	1	282	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (Moxostoma)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	-	1	5	-	-	-	-	-	-	1	160
Brown bullhead	-	-	-	-	-	-	-	-	2	162	-	-	-	-
Channel catfish	-	-	-	-	3	154	3	92	4	347	2	5	2	5
Catfish (Ictalurus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flathead catfish	-	-	2	35	-	-	-	-	-	-	-	-	-	-
White bass	-	-	2	108	9	129	24	534	34	1,945	1	17	-	-
Rock bass	-	-	-	-	1	12	-	-	1	3	-	-	-	-
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Warmouth	-	-	-	-	-	-	-	-	3	32	-	-	-	-
Bluegill	4	19	2	8	49	451	23	267	21	171	-	-	1	1
Longear sunfish	-	-	1	4	-	-	-	-	-	-	-	-	-	-
Sunfish (Lepomis)	-	-	-	-	-	-	-	-	2	5	-	-	-	-
Smallmouth bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Micropterus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White crappie	3	14	9	555	7	144	-	-	1	14	-	-	-	-
Black crappie	1	7	-	-	2	12	1	10	3	49	-	-	-	-
Crappie (Pomoxis)	-	-	-	-	-	-	-	-	1	5	-	-	-	-
Sunfish (Centrarchidae)	-	-	-	-	2	2	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	2	12	-	-
Logperch	-	-	-	-	-	-	1	6	-	-	-	-	-	-
Sauger	-	-	-	-	1	56	1	20	14	3,597	-	-	-	-
Walleye	-	-	1	860	-	-	-	-	-	-	-	-	-	-
Freshwater drum	19	108	42	1,069	255	2,515	684	7,126	111	5,206	56	1,241	4	70
Total	107	1,928	255	8,377	534	9,591	1,520	21,158	1,724	40,754	131	3,057	84	3,845
			(297)				(1,773)	(24,918)			(214)	(5,355)	(111)	(5,006)

TABLE 1 (CONTINUED)

	Feb. 5-6		Feb. 19-20		Mar. 5-6		Mar. 19-20		Mar. 26-27		April 2-3	
	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)	No.	Wt. (g)
Longnose gar	-	-	-	-	-	-	1	158	-	-	-	-
Skipjack herring	-	-	-	-	-	-	-	-	-	-	-	-
Gizzard shad	198	11,800	454	31,192	5	248	20	982	31	717	6	408
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	-	-
Mooneye	-	-	1	27	-	-	2	84	-	-	1	129
Northern pike	-	-	-	-	-	-	-	-	-	-	-	-
Carp	-	-	-	-	-	-	-	-	-	-	-	
Silver chub	-	-	1	2	-	-	-	-	4	26	-	-
Golden shiner	-	-	-	-	1	3	11	125	3	17	2	8
Emerald shiner	9	20	83	241	2	8	2	7	2	5	5	17
Mimic shiner	-	-	-	-	-	-	-	-	-	-	-	-
Bluntnose minnow	-	-	-	-	-	-	-	-	-	-	-	-
Creek chub	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	-	-	2	14	-	-	-	-	-	-	-	-
River carpsucker	-	-	-	-	-	-	1	305	-	-	-	-
Quillback	-	-	-	-	-	-	2	776	-	-	-	-
White sucker	-	-	-	-	-	-	-	-	-	-	-	-
Spotted sucker	-	-	-	-	-	-	-	-	-	-	1	3
Silver redhorse	-	-	-	-	-	-	-	-	-	-	-	-
Golden redhorse	-	-	-	-	-	-	-	-	-	-	-	-
Shorthead redhorse	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (Moxostoma)	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	-	-	-	-	-	-	-	-	-
Brown bullhead	-	-	-	-	-	-	1	260	-	-	-	-
Channel catfish	1	4	2	5	1	3	10	86	1	6	2	12
Catfish (Ictalurus)	-	-	-	-	-	-	-	-	-	-	-	-
Flathead catfish	-	-	-	-	-	-	-	-	-	-	-	-
White bass	1	14	2	573	-	-	-	-	1	112	-	-
Rock bass	-	-	-	-	-	-	-	-	-	-	-	-
Green sunfish	-	-	-	-	-	-	-	-	-	-	-	-
Pumpkinseed	-	-	-	-	-	-	-	-	-	-	-	-
Warmouth	-	-	-	-	-	-	-	-	-	-	-	
Bluegill	-	-	-	-	1	36	-	-	6	164	8	219
Longear sunfish	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Lepomis)	-	-	-	-	-	-	1	1	-	-	-	-
Smallmouth bass	-	-	-	-	-	-	-	-	-	-	-	-
Largemouth bass	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Micropterus)	-	-	-	-	-	-	-	-	-	-	-	-
White crappie	1	112	1	28	-	-	1	32	5	157	1	41
Black crappie	-	-	-	-	-	-	1	57	5	301	-	-
Crappie (Pomoxis)	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Centrarchidae)	-	-	-	-	-	-	-	-	1	6	-	-
Yellow perch	-	-	-	-	3	130	2	104	4	291	-	-
Logperch	-	-	-	-	-	-	2	38	-	-	-	-
Sauger	2	214	4	1,156	-	-	4	759	1	173	1	429
Walleye	-	-	-	-	-	-	-	-	-	-	-	-
Freshwater drum	4	281	32	780	2	44	11	1,615	14	1,154	7	229
Total	216	12,445	582	14,020	15	472	92	5,669	78	1,149	14	1,497
	(305)	(17,529)			(20)	(522)	(96)	(5,942)			(80)	

TABLE 1 (Continued)

	Total			
	No.	%	Wt. (g)	%
Longnose gar	7	+	1,084	0.4
Skipjack herring	15	0.1	1,154	0.4
Gizzard shad	17,142	71.6	149,379	53.5
Herring (Clupeidae)	5	+	15	+
Mooneye	28	0.1	1,120	0.4
Northern pike	5	+	161	0.1
Carp	16	0.1	4,905	1.8
Silver chub	64	0.3	629	0.2
Golden shiner	25	0.1	209	0.1
Emerald shiner	1,400	5.8	4,629	1.6
Mimic shiner	36	0.2	85	+
Bluntnose minnow	2	+	14	+
Creek chub	1	+	22	+
Minnow (Cyprinidae)	46	0.2	102	+
River carpsucker	1	+	385	0.1
Quillback	28	0.1	1,591	0.9
White sucker	1	+	8	+
Spotted sucker	2	+	27	+
Silver redhorse	1	+	10	+
Golden redhorse	18	0.1	871	0.3
Shorthead redhorse	1	+	9	+
Redhorse (Moxostoma)	1	+	13	+
Sucker (Catostomidae)	2	+	165	0.1
Brown bullhead	7	+	681	0.2
Channel catfish	613	2.6	8,751	3.1
Flathead catfish	58	0.2	632	0.2
White bass	101	0.4	6,198	2.2
Rock bass	2	+	15	+
Green sunfish	1	+	20	+
Pumpkinseed	2	+	35	+
Warmouth	31	0.1	1,499	0.5
Bluegill	263	1.1	4,163	1.5
Longear sunfish	18	0.1	975	0.3
Sunfish (Lepomis)	3	+	6	+
Smallmouth bass	3	+	6	+
Largemouth bass	6	+	563	0.2
Sunfish (Micropterus)	1	+	1	+
White crappie	186	0.8	2,332	0.8
Black crappie	71	0.3	2,848	1.0
Crappie (Pomoxis)	8	+	23	+
Sunfish (Centrarchidae)	3	+	8	+
Yellow perch	18	0.1	949	0.3
Logperch	14	0.1	104	+
Sauger	315	1.3	46,813	16.8
Walleye	1	+	860	0.3
Freshwater drum	3,357	14.0	35,329	12.6
Total	23,929		279,418	

+ Less than 0.05 percent

TABLE 2

COMMON AND SCIENTIFIC NAMES[a] OF FISHES[b] COLLECTED DURING IMPINGEMENT AND ENTRAINMENT STUDIES AT THE KYGER CREEK STATION

Common Name	Scientific Name
Longnose gar	*Lepisosteus osseus* (Linnaeus)
Skipjack herring	*Alosa chrysochloris* (Rafinesque)
Gizzard shad	*Dorosoma cepedianum* (Lesueur)
Goldeye	*Hiodon alosoides* (Rafinesque)
Mooneye	*Hiodon tergisus* Lesueur
Northern pike	*Esox lucius* Linnaeus
Carp	*Cyprinus carpio* Linnaeus
Silver chub	*Hybopsis storeriana* (Kirtland)
Golden shiner	*Notemigonus crysoleucas* (Mitchill)
Emerald shiner	*Notropis atherinoides* Rafinesque
Mimic shiner	*Notropis volucellus* (Cope)
Bluntnose minnow	*Pimephales notatus* (Rafinesque)
Creek chub	*Semotilus atromaculatus* (Mitchill)
River carpsucker	*Carpiodes carpio* (Rafinesque)
Quillback	*Carpiodes cyprinus* (Lesueur)
White sucker	*Catostomus commersoni* (Lacépède)
Spotted sucker	*Minytrema melanops* (Rafinesque)
Silver redhorse	*Moxostoma anisurum* (Rafinesque)
Golden redhorse	*Moxostoma erythrurum* (Rafinesque)
Shorthead redhorse	*Moxostoma macrolepidotum* (Lesueur)
Brown bullhead	*Ictalurus nebulosus* (Lesueur)
Channel catfish	*Ictalurus punctatus* (Rafinesque)
Flathead catfish	*Pylodictis olivaris* (Rafinesque)
White bass	*Morone chrysops* (Rafinesque)
Rock bass	*Ambloplites rupestris* (Rafinesque)
Green sunfish	*Lepomis cyanellus* Rafinesque
Pumpkinseed	*Lepomis gibbosus* (Linnaeus)
Warmouth	*Lepomis gulosus* (Cuvier)
Bluegill	*Lepomis macrochirus* Rafinesque
Longear sunfish	*Lepomis megalotis* (Rafinesque)
Smallmouth bass	*Micropterus dolomieui* Lacépède
Largemouth bass	*Micropterus salmoides* (Lacépède)
White crappie	*Pomoxis annularis* Rafinesque
Black crappie	*Pomoxis nigromaculatus* (Lesueur)
Yellow perch	*Perca flavescens* (Mitchill)
Logperch	*Percina caprodes* (Rafinesque)
Sauger	*Stizostedion canadense* (Smith)
Walleye	*Stizostedion vitreum* (Mitchill)
Freshwater drum	*Aplodinotus grunniens* Rafinesque

[a] Nomenclature follows Bailey et al. (1970)

[b] The list includes only those fish identified to species

21

SEASONAL OCCURRENCE

The number and biomass of fish collected per 28-hr impingement survey varied considerably (Figures 2 and 3). The obvious peaks of abundance and biomass during August and December were a result of an increase in impingement of numbers of gizzard shad (Table 1, Figure 2). The February biomass peak was the result of impingement of comparatively low numbers of large gizzard shad.

The gizzard shad was collected during most months, however low numbers or none were collected during March, April, May, and June 28-hr studies (Table 1). Peak numbers of gizzard shad impinged per 28 hr occurred in mid-August and December. Numbers of freshwater drum impinged per 28 hr ranged from 0 to 684; none were impinged from mid-June through early July and 684 were impinged on 4-5 December. The emerald shiner was impinged in low numbers during most 28-hr periods. Greatest numbers (>200) were impinged on 11-12 September, 9-10 and 16-17 October. Numbers of channel catfish impinged per 28-hr were generally less than 30; 120 collected on 21-22 August was the highest total. Other species were collected in low numbers or sporadically throughout the year.

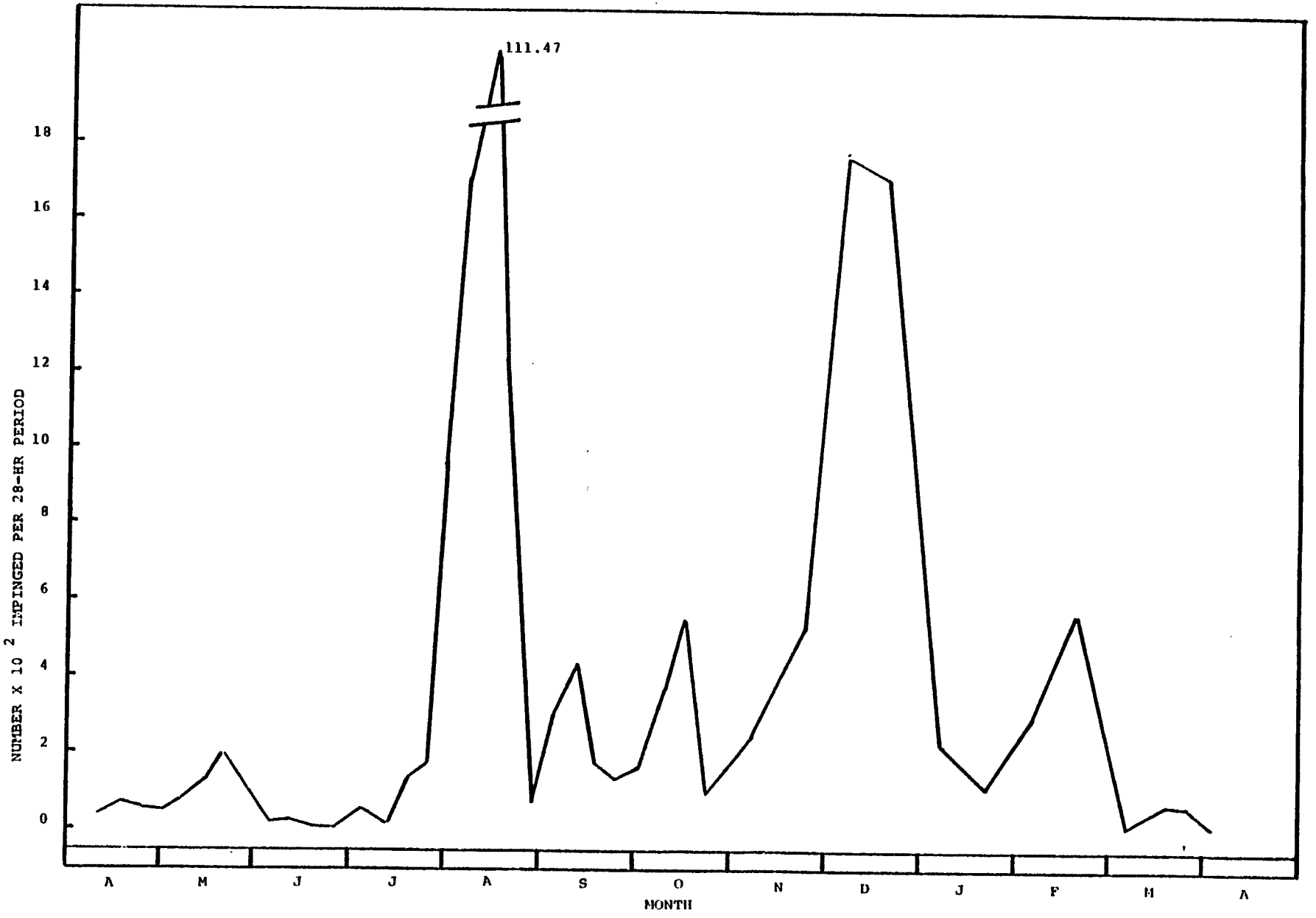

FIGURE 2

NUMBERS OF FISH IMPINGED PER 28-HR PERIOD AT THE KYGER CREEK STATION, APRIL 1978 THROUGH EARLY APRIL 1979

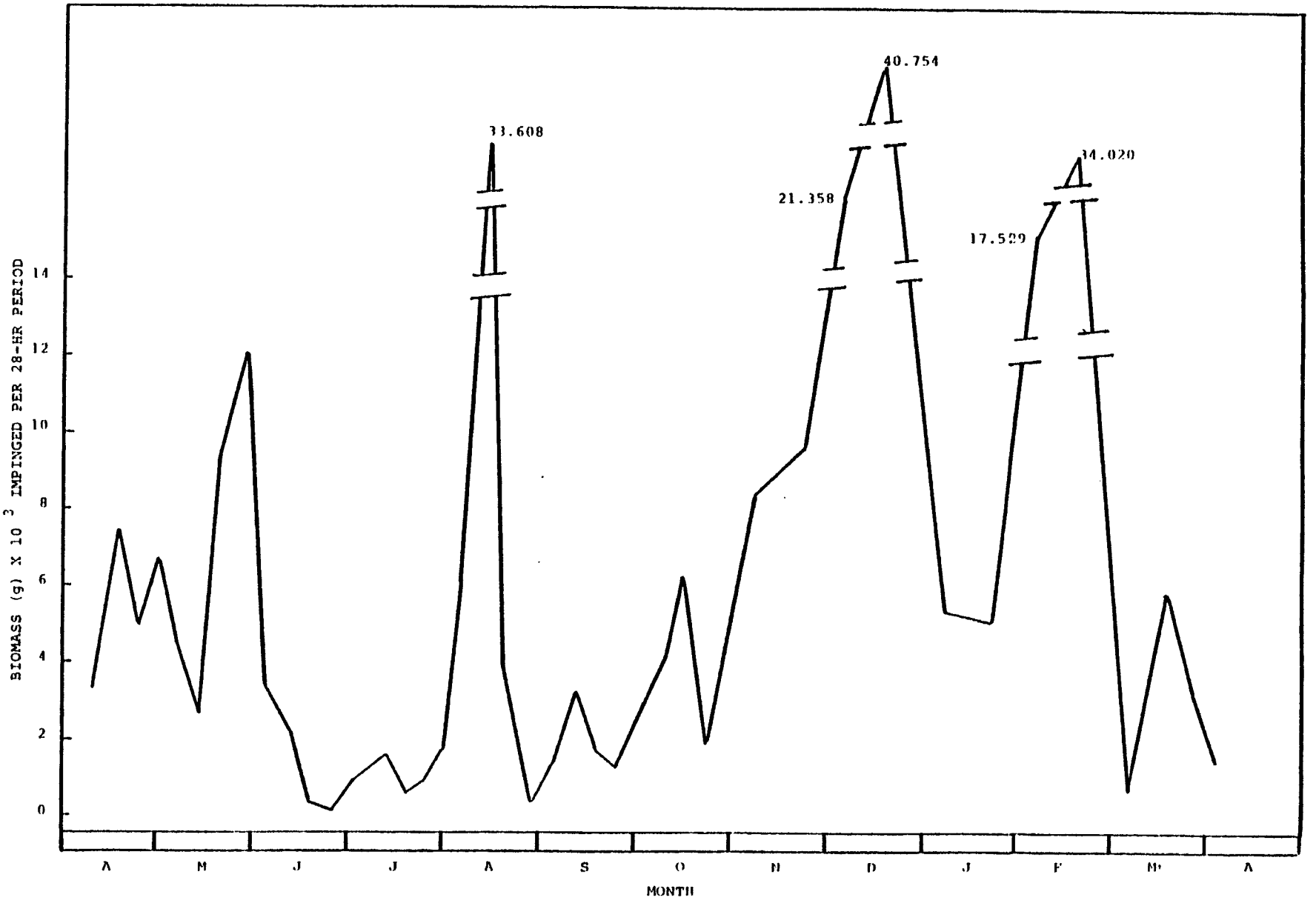

FIGURE 3

BIOMASS OF FISH IMPINGED PER 28-HR PERIOD AT THE KYGER CREEK STATION APRIL 1978 THROUGH EARLY APRIL 1979

DIEL OCCURRENCE

The number of fish collected per 4-hr period showed variation within each 28-hr study. The data from complete 28-hr surveys with comparable series of 4-hr time blocks (28 surveys) were analyzed using the large sample approximation, adjusting for ties, of Friedman's two-way analysis of variance by ranks (Hollander and Wolfe 1973) to test if there was any significant difference in the impingement rate per 4-hr sampling period. The hypothesis that there was no difference between sampling periods was rejected at $P<0.001$ indicating that there was strong evidence to reject the hypothesis. A distribution-free multiple comparison test based on Friedman rank sums was used to determine where the significant differences occurred (Hollander and Wolfe 1973). The results of this analysis are presented in Figure 4. An $\alpha = 0.01$ for each comparison resulted in a total $\alpha = 0.19$ for the group (seven 4-hr periods). Our interpretation of these results is that daytime impingement rates tend to be lower than night-time rates with the greatest differences between the 1200-1600 hr and 2400-0400 hr impingement periods. These differences, however, are probably not of ecological importance.

1200-1600 1600-2000 0800-1200[a] 0800-1200[b] 0400-0800 2000-2400 2900-0400

[a]First 4-hr period

[b]Last 4-hr period

$\alpha = 0.01$ for invididual comparisons

$\alpha = 0.19$ for the group

FIGURE 4

COMPARISON OF FRIEDMAN'S RANK SUMS FOR THE SEVEN COLLECTION PERIODS AT THE KYGER CREEK STATION. SOLID LINE CONNECTS THOSE COLLECTION PERIODS WITH NO SIGNIFICANT DIFFERENCE BETWEEN THEM

ANNUAL LOSS ESTIMATES

An annual estimate of fish lost due to impingement at the Kyger Creek Station was determined, based on the numbers of fish impinged during the first 24 hr of each 28-hr survey. Data for surveys which were not 24 hr in duration were adjusted to represent 24-hr periods which resulted in an average number impinged per 24 hr of 510.2 fish and standard deviation of 1441.324. The average per 24 hr was multiplied by 365 days per year to yield an annual estimate of impingement of 186,223 fish. The 95% confidence limits of number of fish impinged based on the average per 24 hr were 20,173 (lower limit) and 352,273 (upper limit).

RELATION OF FISH IMPINGEMENT TO PREVAILING CONDITIONS

Plant operating and field data are reported in Appendices B and D. The most obvious relationship seemed to be the increased impingement of gizzard shad with low ambient river water temperatures, however no explanation for the high numbers impinged during August was ascertained.

ENTRAINMENT

CATCH COMPOSITION

A total of 26 entrainment studies was performed from March 13 through August 29, 1978. Walleye larvae were collected on March 20-21. No ichthyoplankton was subsequently collected until April 17-18 when several eggs were collected. Larvae of at least nine families were collected from April 24 to August 29. In text and tables, identification indicates fish larvae; eggs were lumped as one taxon. Detail data are reported in Appendix B and are summarized in this section.

The number of ichthyoplankton per 100 m^3 ranged from 0 to 837.8 (Table 3). Suckers (*Carpiodes*), suckers (Catostomida), walleye/sauger, and unidentifiable larvae predominated in May. Carp, cyprinids, suckers (*Carpiodes*), freshwater drum, and unidentifiable larvae were abundant in June. Cyprinids, freshwater drum, and unidentifiable larvae were predominant in July. Freshwater drum was predominant in August.

ESTIMATES OF ICHTHYOPLANKTON ENTRAINED

Estimates of the number of ichthyoplankton entrained per 24 hr by the Kyger Creek Station ranged from 0 to 17.6 million (Figure 5). Peak abundances were in May and June. An estimated 589 million larval fish and eggs were entrained by the station

TABLE 3

NUMBER OF ICHTHYOPLANKTON PER 100m³ FOR EACH TAXON COLLECTED AT OPERATING UNITS OF THE KYGER CREEK STATION, 1978

Date	13-14 March				20-21 March				27-28 March				3-4 April				10-11 April			
Unit	1	2	3	5	1	2	3	5	1	2	3	5	1	2	3	5	1	2	3	5
Herring (Alosa)					-	-	-	-												
Gizzard shad					-	-	-	-												
Herring (Clupeidae)					-	-	-	-												
Mooneye/Goldeye (Hiodon)					-	-	-	-												
Carp					-	-	-	-												
Silver chub					-	-	-	-												
Emerald shiner	NO				-	-	-	-			NO									
Shiner (Notropis)					-	-	-	-												
Minnow (Cyprinidae)					-	-	-	-												
Quillback					-	-	-	-												
Sucker (Carpiodes)					-	-	-	-												
White sucker	SPECIMENS				-	-	-	-					SPECIMENS							
Redhorse (Moxostoma)					-	-	-	-												
Sucker (Catostomidae)					-	-	-	-												
Channel catfish					-	-	-	-												
Catfish (Ictalurus)					-	-	-	-								COLLECTED				
Catfish (Ictaluridae)					-	-	-	-												
White bass	COLLECTED				-	-	-	-												
Temperate bass (Morone)					-	-	-	-												
Sunfish (Lepomis)					-	-	-	-												
Crappie (Pomoxis)					-	-	-	-												
Sunfish (Centrarchidae)					-	-	-	-												
Darter (Etheostoma)					-	-	-	-												
Yellow perch					-	-	-	-												
Walleye					-	-	0.7	-												
Walleye/Sauger (Stizostedion)					-	-	-	-												
Percid (Percidae)					-	-	-	-												
Freshwater drum					-	-	-	-												
Unidentifiable					-	-	-	-												
Eggs					-	-	-	-												
Total	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-

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TABLE 3 (Continued)

	17-18 April					24-25 April					1-2 May				8-9 May				15-16 May			
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	1	2	3	4	1	2	3	4
Herring (*Alosa*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mooneye/Goldeye (*Hiodon*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.6	-	-
Carp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver chub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emerald shiner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shiner (*Notropis*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-
Quillback	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (*Carpiodes*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	354.3	211.8	148.1	409.7
White sucker	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (*Moxostoma*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	166.5	218.2	168.4	230.6	-	-	-	-
Channel catfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Catfish (*Ictalurus*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Catfish (Ictaluridae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperate bass (*Morone*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (*Lepomis*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crappie (*Pomoxis*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	-	-	-
Sunfish (Centrarchidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Darter (*Etheostoma*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye/Sauger (*Stizostedion*)	-	-	-	-	-	-	1.3	1.5	-	-	-	2.0	-	0.8	21.4	32.9	27.0	73.3	11.5	15.9	2.1	27.0
Percid (Percidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
Freshwater drum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	33.6	28.7	57.6	11.6	38.2	119.2	99.7	54.8
Eggs	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	0.7	-
Total	-	0.7	-	-	-	-	1.3	1.5	-	0.7	-	2.0	-	0.8	221.5	279.8	253.0	315.5	405.2	348.1	251.3	492.1

TABLE 3 (Continued)

	22-23 May				29-30 May					5-6 Jun					12-13 Jun				19-20 Jun			
	1	2	3	4	1	2	3	4	5	1	2	3	4	5	1	2	4	5	1	2	4	5
Herring (Alosa)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	-	0.8	1.7	-	4.0	4.2	4.4	5.3	1.4	3.7	9.0	7.6
Mooneye/Goldeye (Hiodon)	-	-	-	-	-	-	-	-	-	3.3	-	-	-	-	-	-	-	-	-	-	-	-
Carp	-	-	-	-	1.5	6.2	5.4	7.6	5.0	104.0	-	115.8	300.2	185.6	149.8	126.0	256.6	206.2	48.4	62.4	105.9	113.4
Silver chub	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	0.8	-	-	-	-
Emerald shiner	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.3	5.2	4.5	46.9
Shiner (Notropis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	-	-	-	-	-	-	-	1.7	-	9.1	-	1.5	60.4	22.7	17.9	42.9	50.4	50.0	12.1	14.1	39.8	43.1
Quillback	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Carpiodes)	9.8	12.0	6.1	41.6	47.2	46.5	-	123.2	51.6	144.5	-	29.1	376.3	29.5	15.2	19.7	44.2	16.7	15.0	21.5	11.5	12.1
White sucker	-	-	-	-	-	-	27.8	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (Moxostoma)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	4.8	-	1.5	-	-	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Catfish (Ictalurus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Catfish (Ictaluridae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White bass	-	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-
Temperate bass (Morone)	-	-	-	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-		-	-	-
Sunfish (Lepomis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-
Crappie (Pomoxis)	-	-	-	-	-	-	-	1.7	0.7	3.3	-	3.1	-	-	2.0	1.4	4.4	0.8	-	-	0.9	0.8
Sunfish (Centrarchidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	0.9	-
Darter (Etheostoma)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye/Sauger (Stizostedion)	1.8	2.4	0.7	3.7	2.2	1.4	0.8	8.4	1.6	1.7	-	-	23.2	7.6	-	2.1	-	-	-	0.7	-	-
Percid (Percidae)	0.6	-	-			2.1	-	-	-	-	-	0.8	0.8	0.8	1.3	1.4	1.8	1.5	-	-	1.8	1.5
Freshwater drum	-	-	-	-	-	-	-	-	-	-	-	-	9.9	0.8	10.6	4.9	22.1	7.6	30.6	31.9	62.4	25.7
Unidentifiable	9.8	2.4	4.1	17.5	3.6	8.9	1.5	12.9	1.6	34.7	320.7	35.3	55.4	28.0	51.0	97.8	74.3	53.8	3.6	21.5	65.2	7.6
Eggs	1.2	-	0.7	-	-	0.7	-	1.7	1.6	5.8	6.2	4.6	9.1	7.6	1.3	4.9	6.2	4.5	1.6	1.5	1.8	3.0
Total	23.2	21.6	11.6	64.3	54.5	65.8	37.8	178.0	68.8	307.2	326.9	191.0	837.8	282.6	253.8	306.0	465.3	347.2	119.0	162.5	326.6	261.7

TABLE 3 (Continued)

	26-27 Jun				3-4 July				10-11 July				17-18 Jul				2[illegible]-25 July			
	1	2	4	5[a]	1	2	4	5	1	2	4	5	1	2	4	5	1	2	4	5
Herring (*Alosa*)	-	-	-	-	3.4	0.7	5.1	1.5	-	-	-	-	-	-	-	-	-	-	-	-
Gizzard shad	-	-	-	-	-	2.8	0.8	0.7	-	-	-	-	-	-	-	-	-	-	-	-
Herring (Clupeidae)	-	2.9	7.0	3.3[a]	-	-	-	-	-	-	1.8	-	-	-	-	-	-	-	-	-
Mooneye/Goldeye (*Hiodon*)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carp	38.9	70.3	111.9	73.7[a]	0.7	3.5	5.1	2.2	-	-	-	-	-	-	-	-	-	-	-	-
Silver chub	-	-	-	-	0.7	0.7	-	2.9	-	-	-	1.4	-	-	-	-	-	-	-	-
Emerald shiner	3.6	3.6	0.9	2.7[a]	8.9	3.5	7.6	74.9	0.7	0.7	-	14.0	0.7	-	4.4	5.4	0.7	-	4.4	5.4
Shiner (*Notropis*)	-	-	-	-	-	-	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Minnow (Cyprinidae)	9.4	12.9	63.8	28.7[a]	61.6	60.6	119.8	31.3	4.3	10.9	23.9	19.6	5.4	32.3	37.9	31.7	5.4	32.3	37.9	31.7
Quillback	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (*Carpiodes*)	46.1	57.4	66.4	56.7[a]	7.5	4.9	17.0	-	-	-	-	-	-	-	-	-	-	-	-	-
White sucker	-	-	-	-	-	-	-	-	0.7	1.5	3.5	2.8	0.7	-	2.6	0.8	0.7	-	2.6	0.8
Redhorse (*Moxostoma*)	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	-	-	-	-	-	-	-	2.7	1.4	0.7	-	-	-	0.7	-	-	-
Channel catfish	-	-	-	-	-	-	-	1.5	-	-	-	-	0.7	-	-	-	0.7	-	-	-
Catfish (*Ictalurus*)	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Catfish (Ictaluridae)	-	-	-	- [b]	-	-	0.8	-	0.7	-	-	-	-	-	-	-	-	-	-	-
White bass	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperate bass (*Morone*)	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (*Lepomis*)	-	-	0.9	0.3[a]	-	-	-	-	-	-	-	-	-	-	1.8	-	-	-	1.8	-
Crappie (*Pomoxis*)	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Centrarchidae)	-	-	-	2.0 [c]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Darter (*Etheostoma*)	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye/Sauger (*Stizostedion*)	-	-	0.9	- [c]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percid (Percidae)	-	-	-	2.0	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Freshwater drum	7.9	9.3	18.4	11.9[a]	25.3	16.2	49.3	8.7	-	1.5	4.4	-	14.2	17.6	44.1	14.7	14.2	17.6	44.1	14.7
Unidentifiable	16.6	32.3	36.7	28.5[a]	31.5	23.3	38.2	12.4	6.4	8.0	20.4	2.8	9.5	19.7	41.4	16.2	9.5	19.7	41.4	16.2
Eggs	-	0.7	-	-	-	-	-	-	0.7	-	-	5.6	-	-	0.9	0.8	-	-	0.9	0.8
Total	121.2	190.1	307.8	210.8	140.3	116.9	249.5	136.1	13.5	22.6	56.7	47.6	31.9	69.6	91.7	69.6	31.9	69.6	91.7	69.6

[a]Unit 5 operating sample not quantitative; average density of other three units substituted for taxa collected at Unit 5.

[b]One spmm actually collected

[c]Two spmm actually collected

TABLE 3 (Continued)

	24-25 July				31 Jul - 1 Aug					7-8 Aug					14-15 Aug					21-22 Aug				
	1	2	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Herring (Alosa)	0.7	-	0.9	-	-	-	-	0.9	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gizzard shad	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herring (Clupeidae)	-	-	-	-	-	-	-	-	-	-	-	2.5	-	0.7	-	-	-	-	-	-	-	-	-	-
Mooneye/Goldeye (Hiodon)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carp	-	-	-	-	-	-	1.4	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver chub	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emerald shiner	-	-	0.9	0.8	4.1	0.7	-	0.9	4.2	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shiner (Notropis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	1.0	7.2	-	-	-	-	-
Minnow (Cyprinidae)	-	1.4	2.7	1.6	0.7	-	0.7	2.6	-	0.7	-	-	-	2.8	0.7	-	0.8	-	1.6	-	-	-	0.9	-
Quillback	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-
Sucker (Carpiodes)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
White sucker	0.7	0.7	7.2	-	-	7.3	2.2	1.7	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Redhorse (Moxostoma)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sucker (Catostomidae)	-	-	-	0.8	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Channel catfish	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-
Catfish (Ictalurus)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	-	-	1.0	-	-	-	-	-	-
Catfish (Ictaluridae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-
White bass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Temperate bass (Morone)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunfish (Lepomis)	-	-	-	-	-	-	-	2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Crappie (Pomoxis)	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	1.0	-	-	-	-	-	-
Sunfish (Centrarchidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.6	6.4	-
Darter (Etheostoma)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Yellow perch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Log perch	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Walleye/Sauger (Stizostedion)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Percid (Percidae)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Freshwater drum	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Unidentifiable	23.0	11.3	54.1	10.9	6.1	5.1	0.7	7.0	3.5	50.4	39.4	13.1	27.3	20.4	1.5	4.6	0.8	3.0	2.4	0.7	0.7	2.3	2.7	1.6
Eggs	2.1	1.4	5.4	5.5	-	-	0.7	-	0.7	0.7	-	0.6	-	-	-	-	-	1.0	-	-	-	0.8	0.9	4.7
	-	-	-	-	-	-	2.2	-	1.4	0.7	-	-	-	-	-	-	-	-	-	-	0.7	0.8	-	-
Total	26.5	14.8	70.3	19.6	10.9	13.1	8.6	17.5	10.5	53.9	40.1	16.2	27.3	23.9	4.4	4.6	1.6	8.0	11.2	1.4	1.4	11.5	10.9	6.3

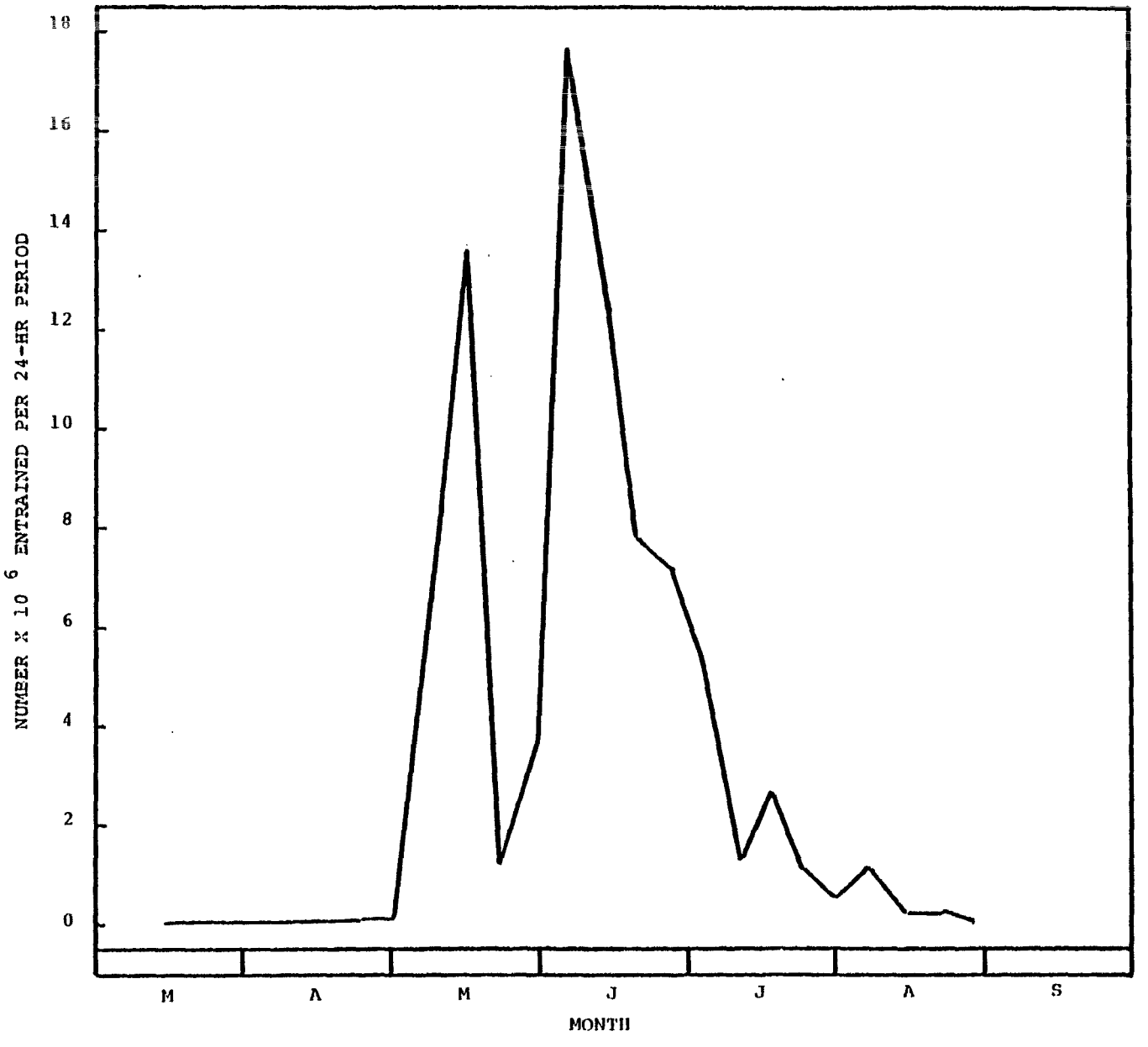

FIGURE 5

ESTIMATES OF ICHTHYOPLANKTON ENTRAINED PER 24-HR PERIOD AT THE KYGER CREEK STATION, MARCH THROUGH SEPTEMBER 1978

(Table 4) assuming there were no ichthyoplankton present during September through February. Carp larvae accounted for 22.1% of the entrained larvae; suckers (Catostomidae) accounted for 20.6%; unidentifiable larvae 17.4%; suckers (Carpiodes) 14.5%, minnows (Cyprinidae) 14.5%; and freshwater drum represented 7.7% of the entrained ichthyoplankton.

Mooneye and the silver chub were included in the official list of endangered fish of Ohio (Ohio Department of Natural Resources undated).

TABLE 4

ESTIMATES[a] OF ICHTHYOPLANKTON ENTRAINMENT PER MONTH
AT THE KYGER CREEK POWER STATION, 1978.

Taxon	March	April	May	June	July	August	Total	Percent
Herring (*Alosa*)	-	-	-	96,900	518,300	-	615,200	0.10
Gizzard shad	-	-	-	95,900	233,600	-	329,500	0.06
Herring (Clupeidae)	-	-	-	3,505,200	114,100	123,600	3,742,900	0.64
Mooneye/Goldeye (*Hiodon*)	-	-	76,100	209,200	-	-	285,300	0.05
Carp	-	-	-	129,264,700	708,100	116,800	130,089,600	22.07
Silver chub	-	-	-	146,700	322,300	44,400	513,400	0.09
Emerald shiner	-	-	-	4,793,500	3,601,500	934,400	9,329,400	1.58
Shiner (*Notropis*)	-	-	-	38,000	228,200	-	266,200	0.04
Minnow (Cyprinidae)	-	-	136,800	32,838,100	25,722,000	527,000	59,223,900	10.05
Quillback	-	-	-	-	-	63,400	63,400	0.01
Sucker (*Carpiodes*)	-	-	18,992,500	65,074,600	1,597,300	-	85,664,400	14.53
White sucker	-	-	1,548,400	258,100	1,774,300	323,300	3,904,600	0.66
Redhorse (*Moxostoma*)	-	-	125,000	77,800	-	-	202,800	0.03
Sucker (Catostomidae)	-	-	121,309,800	-	336,000	19,000	121,664,800	20.64
Channel catfish	-	-	-	13,600	81,500	247,300	342,400	0.06
Catfish (*Ictalurus*)	-	-	-	6,300	38,000	-	44,300	0.01
Catfish (Ictaluridae)	-	-	-	7,200	87,900	-	95,100	0.02
White bass	-	-	-	114,100	-	-	114,100	0.02
Temperate bass (*Morone*)	-	-	-	95,100	-	-	95,100	0.02
Sunfish (*Lepomis*)	-	-	-	120,500	114,100	38,000	272,600	0.05
Crappie (*Pomoxis*)	-	-	168,400	1,080,300	137,700	134,000	1,520,400	0.26
Sunfish (Centrarchidae)	-	-	-	228,200	32,600	911,800	1,172,600	0.20
Darter (*Etheostoma*)	-	-	-	44,400	-	-	44,400	0.01
Yellow perch	-	-	-	13,500	38,000	-	51,500	0.01
Walleye	44,400	-	-	-	-	-	44,400	0.01
Walleye/Sauger (*Stizostedion*)	-	253,600	14,772,000	589,000	-	-	15,614,600	2.65
Percid (Percidae)	-	-	202,800	901,600	43,500	-	1,147,900	0.19
Freshwater drum	-	-	-	16,700,400	18,627,600	9,960,800	45,288,800	7.68
Unidentifiable	-	44,400	24,655,300	62,450,100	14,574,600	614,000	102,338,400	17.36
Eggs	-	44,400	497,200	3,908,100	637,500	237,300	5,324,500	0.90
Total	44,400	342,400	182,484,300	322,671,100	69,569,200	14,295,100	589,406,500	

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APPENDIX A

KYGER CREEK STATION
IMPINGEMENT DATA

Table	Title
1	NUMBER, LENGTH, WEIGHT AND STATUS OF IMPINGED FISH BY SURVEY DATE AT THE KYGER CREEK STATION DURING 1979-1979
2	NUMBERS OF FISH IMPINGED AT THE KYGER CREEK STATION CONSIDERED DEAD PRIOR TO BECOMING IMPINGED

TABLE 1

NUMBER, LENGTH, WEIGHT AND STATUS OF IMPINGED FISH BY SURVEY DATE AT THE KYGER CREEK STATION DURING 1978-1979[a]

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
April 10						
0800-1200	Sauger	1	188	48		1
	Channel catfish	1	b	16	1	
	Black crappie	1	68	5		1
1200-1600	Logperch	1	95	4	1	
	Channel catfish	1	305	203	1	
1600-2000	Freshwater drum	3	144-474	1,299	3	
2000-2400	Freshwater drum	2	117-149	47		2
	Sauger	2	123-212	82	2	
	White crappie	1	155	41	1	
April 11						
2400-0400	Sauger	2	177-200	89	2	
	Channel catfish	1	97	7		1
0400-0800	Freshwater drum	4	114-145	84		4
	Sauger	2	192-218	118	1	1
	White crappie	2	150-155	78	1	1
	Mooneye	1	147	23		1
	Logperch	1	82	4	1	
0800-1200	Freshwater drum	6	121-170	191		6
	Sauger	3	122-340	393	2	1
	White crappie	3	152-288	399	3	
	Channel catfish	2	117-124	40	3	

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TABLE 4

ESTIMATES[a] OF ICHTHYOPLANKTON ENTRAINMENT PER MONTH AT THE KYGER CREEK POWER STATION, 1978.

Taxon	March	April	May	June	July	August	Total	Percent
Herring (*Alosa*)	-	-	-	96,900	518,300	-	615,200	0.10
Gizzard shad	-	-	-	95,900	233,600	-	329,500	0.06
Herring (Clupeidae)	-	-	-	3,505,200	114,100	123,600	3,742,900	0.64
Mooneye/Goldeye (*Hiodon*)	-	-	76,100	209,200	-	-	285,300	0.05
Carp	-	-	-	129,264,700	708,100	116,800	130,089,600	22.07
Silver chub	-	-	-	146,700	322,300	44,400	513,400	0.09
Emerald shiner	-	-	-	4,793,500	3,601,500	934,400	9,329,400	1.58
Shiner (*Notropis*)	-	-	-	38,000	228,200	-	266,200	0.04
Minnow (Cyprinidae)	-	-	136,800	32,838,100	25,722,000	527,000	59,223,900	10.05
Quillback	-	-	-	-	-	63,400	63,400	0.01
Sucker (*Carpiodes*)	-	-	18,992,500	65,074,600	1,597,300	-	85,664,400	14.53
White sucker	-	-	1,548,400	258,100	1,774,300	323,300	3,904,600	0.66
Redhorse (*Moxostoma*)	-	-	125,000	77,800	-	-	202,800	0.03
Sucker (Catostomidae)	-	-	121,309,800	-	336,000	19,000	121,664,800	20.64
Channel catfish	-	-	-	13,600	81,500	247,300	342,400	0.06
Catfish (*Ictalurus*)	-	-	-	6,300	38,000	-	44,300	0.01
Catfish (Ictaluridae)	-	-	-	7,200	87,900	-	95,100	0.02
White bass	-	-	-	114,100	-	-	114,100	0.02
Temperate bass (*Morone*)	-	-	-	95,100	-	-	95,100	0.02
Sunfish (*Lepomis*)	-	-	-	120,500	114,100	38,000	272,600	0.05
Crappie (*Pomoxis*)	-	-	168,400	1,080,300	137,700	134,000	1,520,400	0.26
Sunfish (Centrarchidae)	-	-	-	228,200	32,600	911,800	1,172,600	0.20
Darter (*Etheostoma*)	-	-	-	44,400	-	-	44,400	0.01
Yellow perch	-	-	-	13,500	38,000	-	51,500	0.01
Walleye	44,400	-	-	-	-	-	44,400	0.01
Walleye/Sauger (*Stizostedion*)	-	253,600	14,772,000	589,000	-	-	15,614,600	2.65
Percid (Percidae)	-	-	202,800	901,600	43,500	-	1,147,900	0.19
Freshwater drum	-	-	-	16,700,400	18,627,600	9,960,800	45,288,800	7.68
Unidentifiable	-	44,400	24,655,300	62,450,100	14,574,600	614,000	102,338,400	17.36
Eggs	-	44,400	497,200	3,908,100	637,500	237,300	5,324,500	0.90
Total	44,400	342,400	182,484,300	322,671,100	69,569,200	14,295,100	589,406,500	

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
April 24						
1600-2000	Sauger	3	264-395	1,036	3	
	Freshwater drum	3	105-164	101		3
	Gizzard shad	1	114	17		1
	Black crappie	1	233	192		1
	Emerald shiner	1	93	11		1
	Bluegill	1	77	12		1
2000-2400	Freshwater drum	4	122-251	257		4
	Sauger	4	118-385	692	2	2
	Yellow perch	1	211	119	1	
	Gizzard shad	1	100	13	1	
	Mooneye	1	53	34		1
	Emerald shiner	1	98	14		1
	Bluegill	1	58	9		1
April 25						
2400-0400	Sauger	3	118-452	908	1	2
	White crappie	1	81	8		1
	Bluegill	1	46	4		1
	Freshwater drum	1	151	39		1
	Gizzard shad	1	109	12		1
	Emerald shiner	1	96	11		1
	Warmouth	1	179	134	1	

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
April 25						
0400-0800	Emerald shiner	1	67	3		1
	Golden shiner	1	100	10		1
	Gizzard shad	1	129	15		1
	White bass	1	195	80		1
0800-1200	Freshwater drum	1	161	39		1
	Sauger	1	209	58	1	
	Golden redhorse	1	358	486		1
	Bluegill	1	a	2		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
May 1						
0800-1200	Sauger	7	183-556	1,679	2	5
	Golden redhorse	1	86	5		1
	Freshwater drum	1	175	55		1
1200-1600	Sauger	2	229-254	194	1	1
	Bluegill	2	59-164	81	1	1
	Black crappie	1	246	218	1	
1600-2000	Sauger	3	135-218	1,980	1	2
	Bluegill	2	49-165	83	1	1
	Longear sunfish	1	114	37		1
	Logperch	1	93	4		1
	Black crappie	1	90	6		1
2000-2400	Sauger	5	162-209	224	4	1
	Channel catfish	2	85-250	106	2	
	Yellow perch	1	237	184	1	
	Emerald shiner	1	88	6		1
	Bluntnose minnow	1	77	6		1
	Bluegill	1	53	3		1
May 2						
2400-0400	Sauger	4	150-370	853	1	3
	Emerald shiner	2	100-101	16	1	1
	Channel catfish	2	84-103	11		2
	Longear sunfish	1	145	66	1	

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
May 2						
0400-0800	Sauger	2	172-387	538	1	1
	Emerald shiner	2	87-106	12	1	1
	Logperch	1	84	6	1	1
	Longear sunfish	1	184	124	1	
0800-1200	Mooneye	1	143	21		1
	Sauger	1	262	128		1
May 8						
0800-1200	Sauger	2	189-210	106		2
	Emerald shiner	1	89	5		1
1200-1600	Emerald shiner	8	52-111	43		8
	Freshwater drum	3	163-195	170		3
	Sauger	2	238-247	191		2
	Logperch	1	85	4		1
	White bass	1	192	92		1
	Longear sunfish	1	114	34		1
	Green sunfish	1	114	31		1
	Warmouth	1	154	72		1
	Black crappie	1	290	446	1	
	Bluegill	1	51	4	1	
1600-2000	Sauger	2	153-242	118		
	Channel catfish	2	523-245	139		
	Emerald shiner	1	79	4		
	Logperch	1	93	7		
	Freshwater drum	1	179	60		
	Yellow perch	1	173	64		
	Warmouth	1	168	102		

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
May 8						
2000-2400	Emerald shiner	3	81-87	17		3
	Freshwater drum	2	129-156	84		2
	Sauger	2	205-263	175	2	
	Largemouth bass	1	309	395	1	
	Quillback	1	68	3		1
May 9						
2400-0400	Warmouth	5	64-126	113	4	1
	Emerald shiner	3	83-103	16		3
	Sauger	1	228	67	1	
0400-0800	Emerald shiner	9	80-102	64	1	8
	Freshwater drum	2	100-119	25		2
	Bluegill	2	51-63	8	1	1
	Sauger	1	102	7		1
0800-1200	Emerald shiner	8	65-98	49		5
	Bluegill	4	47-166	88	1	3
	Sauger	3	183-394	904	2	1
	Black crappie	2	232-294	573	1	1
	Freshwater drum	2	115-155	53		2
	Channel catfish	2	121-234	78		2
	Golden shiner	2	73-90	10	2	
	Quillback	1	69	6		1
	Warmouth	1	135	51	1	

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
May 15						
0800-1200	Emerald shiner	7	52-104	51		7
	Bluegill	6	43-150	84	1	5
	Freshwater drum	5	750391	59		4
	Sauger	4	175-370	692	2	2
	Golden shiner	2	61-76	11		2
	Channel catfish	2	86-240	92		2
	Longear sunfish	1	79	12	1	
	Pumpkinseed	1	53	4		1
	Quillback	1	125	26		1
	Mooneye	1	146	28		1
1200-1600	Sauger	2	172-182	72	1	1
	Emerald shiner	2	88	8		2
	Freshwater drum	2	112-165	64		2
	Channel catfish	2	110-292	183		2
	Bluegill	1	140	49	1	
	Quillback	1	78	7		1
	Golden shiner	1	80	9		1
1600-2000	Bluegill	5	49-150	126	1	4
	Sauger	2	135-150	40		2
	Channel catfish	2	90-175	40	1	1
	Largemouth bass	1	175	64	1	
	Emerald shiner	1	83	4		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
May 15						
2000-2400	Emerald shiner	10	55-109	61		10
	Bluegill	5	45-53	10		5
	Gizzard shad	1	105	8		1
	Golden shiner	1	65	4	1	
	White bass	1	158	38	1	
	Sauger	1	192	48	1	
	Logperch	1	84	7	1	
May 16						
2400-0400	Emerald shiner	10	70-110	57	1	9
	Bluegill	2	40-125	37	2	
	Sauger	2	114-255	128		2
	Freshwater drum	2	103-117	24		2
	Gizzard shad	1	142	26		1
	Quillback	1	72	4		1
0400-0800	Emerald shiner	13	63-106	74		13
	Freshwater drum	2	115-140	29	1	1
	Channel catfish	2	181-247	139		2
	Bluegill	1	55	2		1
	Mooneye	1	150	28		1
	Brown bullhead	1	124	22	1	
	Sauger	1	145	21	1	
0800-1200	Emerald shiner	11	61-104	67		11
	Sauger	4	123-146	62	1	3
	Bluegill	2	48-49	7		2
	Warmouth	2	46	7		2
	White sucker	1	85	8		1
	Channel catfish	1	179	38	1	

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
May 22						
0800-1200	Freshwater drum	6	109-151	182		6
	Sauger	6	125-273	326	2	4
	Bluegill	5	63-153	115	1	4
	Emerald shiner	4	74-102	23		4
	White crappie	2	142-161	92	2	
	Channel catfish	2	105-106	20		2
	Quillback	1	89	18	1	
	Black crappie	1	70	4		1
	Warmouth	1	70	27		1
1200-1600	Freshwater drum	5	104-163	152		5
	Sauger	5	129-402	863		5
	White crappie	3	137-145	102	3	
	Emerald shiner	3	78-87	11		3
	Bluegill	2	60-165	57	1	1
1600-2000	Bluegill	2	135-144	110		2
	Channel catfish	2	83-149	29	1	1
	Sauger	2	156-264	154		2
	Quillback	1	60	5		1
	Longear sunfish	1	144	76		1
	White crappie	1	151	37	1	
	Emerald shiner	1	79	7		1
2000-2400	Sauger	17	145-432	1,817	1	16
	Emerald shiner	10	79-104	69		10
	Bluegill	5	55-127	71	1	4
	Warmouth	2	49-180	134	1	1
	Freshwater drum	1	303	304		1
	Quillback	1	145	40		1
	Black crappie	1	157	40		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
May 23						
2400-0400	Sauger	10	115-215	412	3	7
	Emerald shiner	9	54-106	45		9
	Freshwater drum	5	110-170	178	1	4
	Channel catfish	2	100-141	46	1	1
	Warmouth	2	183-184	294	2	
	Bluegill	2	88-146	81	1	1
	Carp	1	87	16		1
	Quillback	1	75	12		1
0400-0800	Sauger	9	153-355	782	3	6
	Emerald shiner	4	87-104	32	1	3
	Quillback	4	77-92	36		4
	Freshwater drum	3	118-151	76	1	2
	Bluegill	1	149	56		1
	Carp	1	103	17		1
	Golden redhorse	1	105	16		1
0800-1200	Sauger	17	125-340	1,397	5	12
	Emerald shiner	9	67-117	61		9
	Freshwater drum	8	134-170	331		8
	Bluegill	8	60-180	362	2	6
	White crappie	4	144-158	152		4
	Channel catfish	2	67-93	13		2
	Green sunfish	1	100	20	1	
	Quillback	1	113	21		1
	Yellow perch	1	79	7		1
	Silver chub	1	93	8		1
	Mooneye	1	158	38	1	

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
May 29						
0800-1200	Sauger	7	192-369	1,840		7
	Bluegill	2	136	53		2
	Carp	1	132	20	1	
	Longear sunfish	1	134	69	1	
	Emerald shiner	1	82	6		1
1200-1600	Sauger	5	188-382	1,285		5
	Warmouth	2	118-156	107		2
	White bass	2	110-187	74		2
	Bluegill	2	141-151	107		2
	Mooneye	2	140-155	62		2
	Channel catfish	1	105	12		1
1600-2000	Sauger	12	144-365	1,792	1	11
	Emerald shiner	2	68-104	11		2
	Longear sunfish	2	128-139	122	1	1
2000-2400	Sauger	8	127-380	965	1	7
	Emerald shiner	6	67-91	34		6
	Mooneye	2	136-145	53		2
	White bass	1	162	51		1
	Freshwater drum	1	141	24		1
	Quillback	1	91	11		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
May 30						
2400-0400	Sauger	9	173-454	2,366		9
	Bluegill	4	54-146	135	1	3
	Emerald shiner	3	64-92	14		3
	Mooneye	1	142	22		1
	Channel catfish	1	85	4		1
	Freshwater drum	1	288	270		1
	Silver chub	1	149	32		1
	Shorthead redhorse	1	86	9		1
0400-0800	Sauger	5	262-379	1,165		5
	Bluegill	2	60-134	42	1	1
	Emerald shiner	2	69-71	6		2
	Warmouth	1	154	68	1	
0800-1200	Sauger	7	148-391	1,371		7
	Emerald shiner	5	58-95	9		5
	Freshwater drum	2	160-167	90	2	
	Logperch	1	89	6		1
	Carp	1	131	29		1
	White bass	1	185	61		1
	White crappie	1	140	30		1
	Redhorse (*Moxostoma*)	1	100	13		1
	Quillback	1	360	572		1

TABLE 1 (Continued)

Date & Time	Taxon	Numbers	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
June 5						
0800-1600	Sauger	4	280-408	1,642		4
	Longear sunfish	1	122	52		1
1200-1600	Sauger	1	177	34		1
	Longear sunfish	1	116	49		1
1600-2000	Sauger	1	298	528		1
	Longear sunfish	1	134	62	1	
2000-2400	Sauger	3	281-345	701		3
	Emerald shiner	1	78	2		1
June 6						
2400-0400	Freshwater drum	1	177	64		1
	Longear sunfish	1	135	73		1
	Warmouth	1	111	24		1
0400-0800	Emerald shiner	1	104	9		1
	Channel catfish	1	76	6		1
0800-1200	Emerald shiner	1		4		1
	Channel catfish	1	135	23		1
	Warmouth	1	131	55	1	
	Sauger	1	190	58		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
June 12						
0800-1200	Sauger	1	185	42		1
	Emerald shiner	1	72	6		1
1200-1600	Emerald shiner	1	110	12		1
1600-2000	Bluegill	2	55-97	21		2
	Logperch	1	91	6		1
	Golden redhorse	1	97	11		1
	Emerald shiner	1	76	3		1
2000-2400	Sauger	2	280-345	468		2
	Bluegill	1	43	1		1
	Longear sunfish	1	129	54	1	
June 13						
2400-0400	Sauger	3	250-390	772		3
	Bluegill	1	139	51	1	
	Freshwater drum	1	160	48		1
	Emerald shiner	1	45	8		1
	Bluntnose minnow	1	60	8		1
0400-0800	Sauger	2	295-338	481		2
	Emerald shiner	1	a	3		1
	Creek chub	1	118	22		1
	Largemouth bass	1	182	74		1
	Golden redhorse	1	56	2		1
	Northern pike	1	124	12		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
June 13						
0800-1200	Bluegill	2	42-62	7		2
	Emerald shiner	1	a	2		1
	Yellow perch	1	115	15		1
June 19						
0800-1200	No fish					
1200-1600	Emerald shiner	1	72	3		1
1600-2000	No fish collected					
2000-2400	Sauger	1	241	82	1	
June 20						
2400-0400	Emerald shiner	3	48-86	10		3
	White bass	1	202	86		1
0400-0800	White bass	1	190	69		1
	Bluegill	1	81	7		1
0800-1200	Longear sunfish	1	95	20		1
	Warmouth	1	119	37		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
June 26						
0800-1200	No fish collected					
1200-1600	No fish collected					
1600-2000	No fish collected					
2000-2400	No fish collected					
June 27						
2400-0400	Emerald shiner	2	79-103	14		2
	Sauger	1	156	29		1
0400-0800	Channel catfish	1	a	12	1	
0800-1200	Emerald shiner	1	74	4		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
July 4 0400-0800	Emerald shiner	4	66-75	12		4
	Mimic shiner	2	63-66	8		2
	Sauger	2	64-219	75		2
	White crappie	2	30-33	2		2
	Mooneye	1	46	1		1
	Minnow (Cyprinidae)	1	21	1		1
	Silver chub	1	103	11		1
0800-1200	Emerald shiner	6	66-84	11		6
	Yellow perch	1	109	14	1	
	Sauger	1	56	2		1
	Mimic shiner	1	51	2		1
July 10 0800-1200	Bluegill	1	141	50		1
	Gizzard shad	1	53	3		1
1200-1600	Bluegill	2	94-145	76		2
	White bass	1	381	575		1
1600-2000	White crappie	2	36-274	2		2
	Sauger	1	407	599		1
2000-2400	Sauger	1	52	1		1
	White crappie	1	41	1		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
July 11 2400-0400	Emerald shiner	1	87	5		1
	Gizzard shad	1	61	3		1
0400-0800	Gizzard shad	1	61	2		1
	Flathead catfish	1	241	141		1
	Silver chub	1	128	19		1
	White crappie	1	41	1		1
	Black crappie	1	39	1		1
	Mimic shiner	1	67	4		1
	Golden redhorse	1	91	8		1
0800-1200	Gizzard shad	3	57-62	9		3
	Longear sunfish	1	122	47	1	
	White crappie	1	37	1		1
July 17 0800-1200	Gizzard shad	5	36-72	10		5
	Longnose gar	1	177	11		1
	Sauger	1	64	2		1
	Bluegill	1	75	8		1
	Black crappie	1	35	1		1
1200-1600	Gizzard shad	3	51-59	8		3
	Sauger	1	86	5		1
	Black crappie	1	37	1		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
July 24						
0800-1200	Gizzard shad	5	44-86	16		5
	Channel catfish	3	47-59	7		3
	White crappie	2	40-59	3		2
	Freshwater drum	1	60	3		1
	Emerald shiner	1	69	3		1
	Sauger	1	205	76		1
1200-1600	Gizzard shad	4	55-250	173		4
	Emerald shiner	2	71	4		2
	Channel catfish	2	45-56	4		2
	Freshwater drum	1	51	3		1
	Black crappie	1	42	2		1
1600-2000	Sauger	1	65	2		1
	White crappie	1	55	3		1
	Flathead catfish	1	49	2		1
2000-2400	Freshwater drum	16	39-62	30		16
	Gizzard shad	9	47-70	33		9
	Channel catfish	7	41-60	16	2	5
	Emerald shiner	2	35-77	5		1
	Quillback	1	41	1		1
	Mimic shiner	1	50	1		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
July 25 2400-0400	Gizzard shad	18	50-103	72		18
	Freshwater drum	17	42-61	26		17
	Channel catfish	5	48-80	12		5
	Sauger	1	200	64		1
	White bass	1	66	6		1
	Quillback	1	47	4		1
	Golden redhorse	1	54	5		1
	Flathead catfish	1	49	2		1
	Crappie (Pomoxis)	1	48	1		1
0400-0800	Gizzard shad	32	49-105	115		32
	Channel catfish	12	41-66	13		12
	Freshwater drum	9	41-59	18		9
	Emerald shiner	4	40-97	20		4
	Flathead catfish	2	49	4		2
	Brown bullhead	1	50	1	1	
	White bass	1	72	6		1
	Bluegill	1	135	57		1
	White crappie	1	48	1		1
0800-1200	Gizzard shad	13	42-86	32		13
	Channel catfish	3	55-61	6		3
	Freshwater drum	2	50-54	4		2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
July 31						
0800-1200	Gizzard shad	7	53-96	22		7
	Channel catfish	5	45-63	8		5
	Flathead catfish	2	51-56	4		2
1200-1600	Gizzard shad	3	53-78	7		3
	Channel catfish	3	45-63	4		3
	Freshwater drum	2	53-306	380		2
	Bluegill	1	147	68	1	
	Flathead catfish	1	58	2		1
1600-2000	Gizzard shad	2	76	13		2
	Channel catfish	1	57	1		1
	White crappie	1	55	2		1
	Emerald shiner	1	63	1		1
	Logperch	1	86	4		1
	Freshwater drum	1	298	318		1
2000-2400	Freshwater drum	31	43-75	56		31
	Gizzard shad	27	55-95	106		27
	White crappie	3	44-50	3		3
	Channel catfish	2	50-55	2		2
	Mooneye	1	192	72		1
	Black crappie	1	50	1		1
	Flathead catfish	1	51	1		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978 August 1						
2400-0400	Freshwater drum	286	40-88	865	1	286
	Gizzard shad	224	49-100	920		224
	Channel catfish	10	40-63	15	1	9
	Flathead catfish	4	47-64	9		4
	White crappie	2	45-56	4		2
	Emerald shiner	2	71-84	6		1
	Silver chub	2	121-124	41		2
	White crappie	2	45-47	2		2
	Sauger	1	91	6		1
0400-0800	Freshwater drum	141	44-82	283		141
	Gizzard shad	113	55-106	528		113
	Channel catfish	6	39-60	11	1	5
	White crappie	2	47-50	2		2
	White bass	1	340	334		1
	Flathead catfish	1	47	2		1
	Emerald shiner	1	105	5		1
	White crappie	1	54	3		1
	Bluegill	1	55	1		1
0800-1200	Freshwater drum	32	43-75	65		32
	Gizzard shad	22	50-133	105		22
	Channel catfish	5	44-65	8		5
	White crappie	2	45-57	2		2
	Black crappie	2	47-51	2		2
	Sauger	1	86	6		1
	Flathead catfish	1	56	2		1
	Brown bullhead	1	a	14		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
August 8						
2400-0400	Gizzard shad	405	48-109	1,213		405
	Freshwater drum	191	46-88	457		191
	White crappie	15	37-58	24		15
	Channel catfish	14	50-70	17	1	13
	Black crappie	3	41-47	3		3
	Emerald shiner	2	30-57	2		2
	White bass	2	76-208	108		2
	Silver chub	2	117-120	36		2
	Carp	1	244	161		1
	Silver redhorse	1	100	10		1
	Crappie (Pomoxis)	1	-	2		1
0400-0800	Gizzard shad	242	44-107	734		242
	Freshwater drum	98	36-83	256		98
	Channel catfish	14	43-69	30	3	11
	White crappie	9	47-57	13		9
	Mimic shiner	4	54-58	4		4
	Black crappie	3	42-55	6		3
	Flathead catfish	2	65-66	6		2
	White bass	1	109	20		1
	Silver chub	1	120	21		1
	Carp	1	220	101		1
0800-1200	Gizzard shad	120	55-91	289		120
	Freshwater drum	18	45-75	38		18
	White crappie	6	56-55	5		6
	Channel catfish	3	55	3		2
	Flathead catfish	3	56-71	7	1	2
	Emerald shiner	2	42-94	5		2
	Mimic shiner	1	55	1		1
	Black crappie	1	47	1		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
August 14 0800-1200	Gizzard shad	154	52-142	687		154
	Freshwater drum	31	52-96	162		31
	Channel catfish	13	47-90	81	2	11
	White crappie	6	45-57	12		6
	Emerald shiner	5	48-97	17		5
	Bluegill	3	35-58	7		3
	Sauger	2	125-198	80		2
	Flathead catfish	2	73-87	9		2
	Black crappie	2	54-63	b		2
	Largemouth bass	1	68	4		1
	Silver chub	1	55	2		1
1200-1600	Gizzard shad	162	46-125	814		162
	Freshwater drum	22	57-96	108		22
	Channel catfish	12	62-335	306		12
	White crappie	5	45-61	12		5
	Black crappie	3	48-52	8		3
	Emerald shiner	3	99	8		1
	Sauger	2	168	40		1
	Bluegill	1	37	1		1
	Flathead catfish	1	75	6	1	
	Quillback	1	60	2		1
1600-2000	Gizzard shad	251	44-128	1,068		251
	Freshwater drum	8	53-77	24		8
	White crappie	3	44-55	9		3
	Black crappie	2	41-47	4		2
	Sauger	1	96	6		1
	Quillback	1	80	6		1
	Bluegill	1	35	2		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
August 14 2000-2400	Gizzard shad	2,103	44-265	8,120		2,103
	Freshwater drum	28	54-96	153		28
	Emerald shiner	10	33-92	37		10
	White crappie	6	41-57	12		6
	Channel catfish	6	52-80	18		6
	Flathead catfish	3	65-80	15	1	2
	Sauger	4	104-310	508		4
	Bluegill	3	35-42	6		3
	Skipjack herring	2	104-105	16		2
	Black crappie	2	43-47	2		2
	Carp	1	246	134	1	
	Silver chub	1	120	16		1
	Quillback	1	69	2		1
August 15 2400-0400	Gizzard shad	2,984	32-50	8,954		2,984
	Freshwater drum	29	48-100	128		29
	Channel catfish	12	41-76	30		12
	White crappie	8	45-58	18		8
	Emerald shiner	6	42-68	12		6
	Sauger	3	103-190	82		3
	Flathead catfish	3	66-79	16	1	2
	Golden shiner	1	102	12		1
	Bluegill	1	40	2		1
	Mooneye	1	86	6		1
	White bass	1	78	8		1
	Logperch	1	99	8		1
	Black crappie	2	48-55	6		2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
August 15 0400-0800	Gizzard shad	3,151	44-144	9,335		3,151
	Freshwater drum	20	52-85	88		20
	White crappie	12	39-59	26		12
	Emerald shiner	14	39-95	34		14
	Sauger	5	99-144	69		5
	Channel catfish	5	37-82	11		5
	Bluegill	2	41-45	4		2
	Golden redhorse	1	50	2		1
	White bass	1	116	23		1
	Black crappie	5	39-55	12		5
0800-1200	Gizzard shad	1,966	49-105	4,716		1,966
	Freshwater drum	17	48-86	79		17
	White crappie	9	42-63	18		9
	Emerald shiner	5	60-88	17		5
	Sauger	3	115-180	76		3
	Channel catfish	2	85-335	256		2
	Flathead catfish	2	64-86	12		2
	Bluegill	2	30-37	2		2
	Skipjack herring	1	74	2		1
	Largemouth bass	1	85	8		1
	Crappie (*Pomoxis*)	2	-	4		2
August 21 0800-1200	Gizzard shad	79	42-91	200		79
	Channel catfish	5	59-363	374	1	5
	Emerald shiner	4	55-115	28		4
	Freshwater drum	3	64-80	17		3
	Flathead catfish	3	77-85	20	1	2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
August 21 1200-1600	Gizzard shad	15	45-93	33		15
	Channel catfish	14	40-93	43	3	11
	Emerald shiner	4	46-88	15		4
	Flathead catfish	1	79	6		1
1600-2000	Gizzard shad	11	48-105	30		11
	Channel catfish	5	57-94	22		5
	Emerald shiner	1	a	2		1
2000-2400	Gizzard shad	219	48-117	532		219
	Channel catfish	23	44-95	69	4	19
	Emerald shiner	6	43-62	12		6
	Freshwater drum	2	70-84	10		2
	Flathead catfish	2	80-90	10	2	
	Mimic shiner	1	53	2		1
	White crappie	1	90	8		1
August 22 2400-0400	Gizzard shad	361	41-123	852		361
	Channel catfish	41	38-109	148	3	38
	Emerald shiner	17	34-109	34		17
	Freshwater drum	4	49-80	14		4
	Mimic shiner	1	55	3		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
August 22						
0400-0800	Gizzard shad	218	42-111	446		218
	Channel catfish	19	41-93	39	1	18
	Freshwater drum	5	33-80	12		5
	Emerald shiner	4	27-111	26		4
	White crappie	3	45-55	4		2
	Flathead catfish	2	75-83	10		2
	Sauger	2	252	131		2
	Brown bullhead	1	322	222		1
	Black crappie	1	150	48	1	
0800-1200	Gizzard shad	153	40-82	324		153
	Channel catfish	13	51-89	49	2	11
	Flathead catfish	1	68	5		1
	Freshwater drum	1	40	4		1
	Emerald shiner	1	63	3		1
August 28						
0800-1200	Channel catfish	5	42-97	19	2	3
	Freshwater drum	3	54-103	16		3
	Gizzard shad	1	72	4		1
1200-1600	Channel catfish	2	71	8	1	1
	Gizzard shad	2	51-74	5		2
	Silver chub	1	71	4		1
	Freshwater drum	1	105	15		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
August 28 1600-2000	Gizzard shad	2	47-74	7		2
	White crappie	2	68-87	13		2
	Freshwater drum	1	100	12		1
	Bluegill	1	45	2		1
	Channel catfish	1	114	14		1
	Emerald shiner	1	49	1		1
2000-2400	Gizzard shad	7	50-102	26		7
	Freshwater drum	7	41-110	30		7
	Bluegill	4	42-51	10		4
	Channel catfish	3	48-87	11	1	2
	Emerald shiner	2	36-40	2		2
August 29 2400-0400	Freshwater drum	9	45-125	61		9
	Channel catfish	4	55-93	22		4
	Silver chub	1	136	26		1
0400-0800	Freshwater drum	5	52-88	19		5
	Channel catfish	4	47-86	11		4
	Bluegill	3	42-50	3		3
	Gizzard shad	2	52-7	7		2
	Mimic shiner	1		4		1
0800-1200	Channel catfish	4	58-81	10	1	3
	Bluegill	4	42-53	6		4
	Gizzard shad	2	55-67	2		2
	Longnose gar	1	287	39		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
September 4						
0800-1200	Freshwater drum	5	58-71	18		5
	Channel catfish	6	55-89	19	1	5
	Bluegill	4	42-85	19		4
	Emerald shiner	2	40-50	5		2
	Silver chub	1	74	10		1
	Skipjack herring	1	123	12		1
	White crappie	1	67	4		1
1200-1600	Channel catfish	6	49-97	20	1	5
	Freshwater drum	3	78-132	35		3
	Emerald shiner	2	39-62	5		2
1600-2000	Channel catfish	4	44-72	11	1	3
	Bluegill	3	41-49	8		3
	Freshwater drum	2	97-110	29		2
	Silver chub	2	60-133	27		2
	Emerald shiner	1	60	2		1
2000-2400	Freshwater drum	31	52-80	94		31
	Gizzard shad	29	66-121	216		29
	Emerald shiner	22	31-71	50		22
	Channel catfish	8	46-122	30		8
	White crappie	4	58-65	14		4
	Silver chub	3	47-133	28		3
	Bluegill	1	49	2		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 5						
2400-0400	Gizzard shad	40	50-108	212		40
	Freshwater drum	34	47-100	126		34
	Emerald shiner	18	41-72	32		18
	Channel catfish	10	60-97	34	2	8
	Black crappie	3	47-64	7		3
	White crappie	2	49-53	4		2
	Silver chub	2	66-67	6		2
	Smallmouth bass	1	47	1		1
	Flathead catfish	1	60	3		1
0400-0800	Freshwater drum	20	52-75	66		20
	Emerald shiner	10	38-72	21		10
	Channel catfish	7	65-99	35	2	5
	Gizzard shad	7	65-100	64		7
	Mimic shiner	3	61-77	11		3
	Silver chub	1	126	20		1
	Black crappie	1	55	3		1
	Minnow	1		2		1
0800-1200	Gizzard shad	7	66-118	51		7
	Channel catfish	6	46-101	30		6
	Freshwater drum	4	60-120	34		4
	Mimic shiner	4	53-55	9		4
September 11						
0800-1200	Freshwater drum	8	62-117	58		8
	Channel catfish	7	48-134	38	1	6
	Emerald shiner	5	66-104	33		5
	Flathead catfish	1		12		1
	Gizzard shad	1	105	12		1
	Bluegill	1	40	2		1
	Silver chub	1	162	38		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 11 1200-1600	Freshwater drum	5	93-127	65		5
	Emerald shiner	2	45-94	8		2
	Minnow	2		4		2
	Channel catfish	1	b	13		1
	Flathead catfish	1	72	5		1
	Bluegill	1	50	2		1
1600-2000	Freshwater drum	5	57-125	46		5
	Channel catfish	5	45-113	26	1	4
	Emerald shiner	5	45-75	15		5
	Bluegill	2	47-48	6		2
2000-2400	Emerald shiner	122	38-97	244		122
	Freshwater drum	39	57-142	267		39
	Channel catfish	16	50-257	190	1	15
	Gizzard shad	9	84-118	134		9
	Silver chub	4	62-78	17	1	3
	Flathead catfish	4	87-135	70	3	1
	Mimic shiner	3	60-78	6		3
	Skipjack herring	1	119	16		1
September 12 2400-0400	Emerald shiner	37	34-100	80		37
	Freshwater drum	31	39-123	200		31
	Channel catfish	11	56-111	51	2	9
	Gizzard shad	2	95-98	24		2
	Mimic shiner	2	62-65	4		2
	Silver chub	2	62-66	4		2
	Skipjack herring	1	98	9		1
	Black crappie	1	60	3		1
	Mooneye	1	297	267		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 12 0400-0800	Emerald shiner	31	40-82	62		31
	Freshwater drum	16	66-124	118		16
	Minnow	8	57	16		8
	Mimic shiner	6	41-77	8		6
	Gizzard shad	6	56-144	51		6
	Channel catfish	4	64-320	250		4
	White crappie	1	60	3		1
0800-1200	Channel catfish	12	49-120	86		12
	Emerald shiner	6	46-74	1		6
	Freshwater drum	5	57-124	30		5
	Minnow	4		8		4
	Crappie (*Pomoxis*)	2	67-72	10		2
	Sauger	2	237-367	528		2
	Flathead catfish	1	135	36		1
	Mimic shiner	1	84	7		1
September 18 0800-1200	Channel catfish	6	51-335	268		6
	Freshwater drum	4	85-95	31		4
	Emerald shiner	1	61	2		1
	Silver chub	1		6		1
	Flathead catfish	1	135	23		1
1200-1600	Channel catfish	4	50-65	20	4	
	Freshwater drum	2	94-157	40		2
	Gizzard shad	1	95	26		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 18						
1600-2000	Emerald shiner	19	42-69	50		19
	Channel catfish	31	65-135	30		3
	Silver chub	3	77-81	12		3
	Freshwater drum	1	95	8		1
	Skipjack herring	1	125	16		1
2000-2400	Freshwater drum	18	56-115	118	1	17
	Emerald shiner	14	47-78	30		14
	Channel catfish	9	57-312	429		9
	Sivler chub	3	59-65	7		3
	Gizzard shad	1	62	3		1
	Flathead catfish	1	b	7		1
September 19						
2400-0400	Freshwater drum	14	45-90	70		14
	Emerald shiner	8	51-79	17		8
	Channel catfish	7	55-324	286		7
	Bluegill	1	58	3		1
	Silver chub	1	81	5		1
0400-0800	Freshwater drum	6	52-142	53		6
	Emerald shiner	6	43-82	17		6
	Channel catifsh	4	50-100	15		4
	Flathead catfish	1	144	41		1
	Silver chub	1	68	4		1
1000-1230	Channel catfish	3	69-114	26		3
	Freshwater drum	2	46	6		2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 25						
1200-1600	Emerald shiner	3	44-73	4		3
	Freshwater drum	1	64	3		1
	Channel catfish	1	238	83		1
1645-2230	Emerald shiner	33	49-74	78		33
	Freshwater drum	4	49-98	20		4
	Channel catfish	3	59-73	8		3
	Bluegill	1	182	132		1
	Longear sunfish	1	148	74		1
2230-2400	Freshwater drum	2	50	2		2
	Emerald shiner	2	62-68	6		2
	White crappie	1	60	3		1
	Channel catfish	1	87	7		1
September 26						
2400-0400	Freshwater drum	10	49-112	37		10
	Emerald shiner	7	46-77	16		7
	Channel catfish	1	60	2		1
	Black crappie	1	75	4		1
0400-0800	Emerald shiner	9	41-103	23		9
	Freshwater drum	4	61-91	15		4
	Channel catfish	2	b	12		2
	Gizzard shad	2	121-160	61		2
	Mimic shiner	1	41	1		1
	Flathead catfish	1	b	29		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 26 0800-1200	Emerald shiner	16	45-70	22		16
	Gizzard shad	11	122-148	294		11
	Channel catfish	4	56-156	26		5
	Freshwater drum	4	59-105	29		4
	Silver chub	2	84-144	34		4
	Black crappie	1	72	4		2
						1
1200-1600	Gizzard shad	7	104-154	179		7
	Emerald shiner	1	65	3		1
	Flathead catfish	1	115	16		1
	Silver chub	1	137	25		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
October 2						
0800-1200	Channel catfish	4	54-110	22		4
	Emerald shiner	4	57-79	8		4
	Freshwater drum	1	47	2		1
1200-1600	Gizzard shad	7	115-192	267	1	6
	Channel catfish	3	246-321	361		3
	Emerald shiner	3	48-75	5		3
1600-2000	Emerald shiner	35	51-82	136		35
	Gizzard shad	10	140-210	498		10
	Channel catfish	3	72-115	20	1	2
	Skipjack herring	2	140-263	208		1
	Freshwater drum	1	b	4		1
	Bluegill	1	63	5		1
2000-2400	Emerald shiner	18	55-112	61		18
	Freshwater drum	9	47-67	17		9
	Channel catfish	2	71-130	13		2
	Silver chub	1	b	4		1
	Bluegill	1	51	3		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
October 3						
2400-0400	Freshwater drum	6	53-247	170		6
	Emerald shiner	5	51-83	16		5
	Channel catfish	2	54-318	227	1	1
	White crappie	2	60-64	6		2
	Bluegill	1	74	8		1
	Gizzard shad	1	104	12		1
	Silver chub	1	70	3		1
0400-0800	Emerald shiner	26	52-112	74		26
	Silver chub	2	65-79	2		2
	Gizzard shad	4	85-197	148		4
	Channel catfish	4	88-278	164		4
	Freshwater drum	3	52-76	9		3
	Flathead catfish	1	165	56		1
0800-1200	Emerald shiner	3	64-72	11		3
	Gizzard shad	1	178	60		1
	Freshwater drum	1	85	8		1
October 9						
0800-1200	Emerald shiner	43	54-104	131		43
	Freshwater drum	8	41-152	103		8
	Gizzard shad	4	92-106	99		4
	Channel catfish	3	62-424	600	1	2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
October 9						
1200-1600	Emerald shiner	12	57-81	32		12
	Minnow (Cyprinidae)	4	b	8		4
	Freshwater drum	3	b	39		3
	Gizzard shad	2	103-165	64		2
	Channel catfish	1	69	4		1
	Bluegill	1	77	8		1
	Skipjack herring	1	241	144		1
1600-2000	Emerald shiner	30	50-83	139		30
	Freshwater drum	6	45-159	153		6
	Gizzard shad	5	106-190	238	5	
	Channel catfish	3	76-155	31		3
	Minnow (Cyprinidae)	2	b	4		2
2000-2400	Emerald shiner	49	56-85	150	1	48
	Freshwater drum	38	44-265	444		38
	Gizzard shad	4	62-210	136		4
	Channel catfish	4	66-112	27	1	3
October 10						
2400-0400	Freshwater drum	31	45-247	370		31
	Emerald shiner	29	52-84	83		29
	Gizzard shad	4	101-244	254		3
	Minnow (Cyprinidae)	3	b	6		3
	Skipjack herring	1	195	64		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
October 10 0400-0800	Emerald shiner	34	49-89	101		34
	Freshwater drum	16	49-113	69		16
	Gizzard shad	5	84-181	128		5
	Channel catfish	3	60-61	6		3
	Minnow (Cyprinidae)	3	b	6		3
0800-1200	Emerald shiner	6	60-77	19		6
	Freshwater drum	5	57-220	176		5
	Gizzard shad	4	95-195	222		4
	Channel catfish	3	71-115	21	1	2
October 16 0800-1200	Freshwater drum	131	48-150	425		131
	Emerald shiner	46	42-99	142		46
	Gizzard shad	7	94-195	166		7
	Channel catfish	6	51-140	57	3	3
	Bluegill	1	51	2		1
	White crappie	1	82	5		1
	White bass	1	215	139		1
	Sauger	1	274	186		1
	Silver chub	1	66	5		1
1200-1600	Emerald shiner	11	50-73	25		11
	Freshwater drum	7	53-74	13		7
	Gizzard shad	4	179-204	317		4
	Channel catfish	3	74-213	179	1	2
	Bluegill	2	47-196	174	1	1
	Silver chub	2	148-151	56		2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
October 16 1600-2000	Emerald shiner	25	52-89	80	2	23
	Freshwater drum	20	50-112	94		20
	Gizzard shad	9	112-205	346	1	8
	Channel catfish	5	76-415	850	2	3
	Bluegill	3	48-58	6	2	1
	Silver chub	1	72	4	1	
	Black crappie	1	97	10		1
2000-2400	Freshwater drum	52	54-174	295		52
	Emerald shiner	38	42-80	108		38
	Gizzard shad	5	118-181	177		5
	Channel catfish	2	60-101	10	1	1
	Longnose gar	1	355	90	1	
	Bluegill	1	55	3		
	Warmouth	1	65	5	1	
October 17 2400-0400	Emerald shiner	27	53-93	105		27
	Freshwater drum	23	45-164	140	3	20
	Gizzard shad	5	91-140	88		5
	Channel catfish	2	68-218	86	1	1
	Longnose gar	1	399	114	1	1
	White bass	1	192	100		1
	Bluegill	1	48	2		1
0400-0800	Emerald shiner	40	52-85	129		40
	Freshwater drum	9	45-65	17		9
	Silver chub	4	75-91	20	1	3
	Gizzard shad	4	110-131	78		4
	White crappie	1	61	3		1
	Minnow (Cyprinidae)	1	b	2		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
October 17 0800-1200	Gizzard shad	22	62-228	1,045	4	18
	Emerald shiner	20	62-85	54		20
	Bluegill	3	52-67	14	3	
	Freshwater drum	2	62-103	17		2
	Skipjack herring	2	174-265	227		2
	Channel catfish	1	69	4		1
	Largemouth bass	1	115	18	1	
	White crappie	1	74	4		1
October 23 0800-1200	Gizzard shad	7	83-214	244		7
	Freshwater drum	5	55-128	60		5
	Emerald shiner	3	59-80	4		3
	Minnow (Cyprinidae)	1		2		1
1200-1600	Gizzard shad	5	80-202	167		5
	Emerald shiner	2	68-80	8		2
	Freshwater drum	2	67-74	8		2
1600-2000	Gizzard shad	8	66-204	337		8
	Freshwater drum	3	50-100	16		3
	Emerald shiner	3	59-79	11		3
	Bluegill	2	41-56	6		2
	Minnow (Cyprinidae)	2	65	4		2
	White crappie (*Pomoxis*)	1	71	4	1	
	Longnose gar	1	418	150		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
2000-2400	Gizzard shad	9	76-174	169		9
	Freshwater drum	6	60-69	14		6
	Emerald shiner	3	60-78	9		3
		2	78-80	10		2
	Bluegill	1	54	3	1	
	Skipjack herring	1	231	100		1
October 24 2400-0400	Gizzard shad	12	84-180	136		12
	Freshwater drum	3	56-90	10		3
	Emerald shiner	2	45-71	4		2
	Bluegill	1	76	10		1
	Quillback	1	94	8		1
0400-0800	Gizzard shad	8	76-176	144		8
	Emerald shiner	5	50-77	12		5
0800-1200	Gizzard shad	4	82-205	114		4
	Emerald shiner	2	67-81	6		2
	Black crappie	1	80	7		1
	Skipjack herring	1	258	151		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978 November 6 0800-1200	Gizzard shad	14	65-342	601		14
	Freshwater drum	4	62-131	38		4
	White crappie	2	75-87	14		2
	White bass	1	113	18		1
	Minnow (Cyprinidae)	1	b	2		1
1200-1600	Gizzard shad	11	74-203	387		11
	White crappie	2	66-76	7	1	1
	Bluegill	1	62	4		1
	Flathead catfish	1	97	9		1
1600-2000	Gizzard shad	41	92-259	1,576	1	40
	Freshwater drum	7	55-120	54		7
	Emerald shiner	1	78	4		1
	Silver chub	1	73	3		1
2000-2400	Gizzard shad	32	86-240	1,072		32
	Freshwater drum	17	55-368	752	3	14
	White bass	1	199	90	1	
	Flathead catfish	1	130	26	1	
	Bluegill	1	63	4		1
	Longear sunfish	1	64	4	1	
	White crappie	1	95	10		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
November 7 2400-0400	Gizzard shad	34	23-212	908		34
	Freshwater drum	7	55-114	43		7
	Silver chub	1	90	9		1
	Walleye	1	444	860	1	
	Skipjack herring	1	272	191		1
	Emerald shiner	1	69	5		1
0400-0800	Gizzard shad	56	55-227	976		56
	Freshwater drum	7	58-237	182		7
	White crappie	4	80-292	524	1	3
	Emerald shiner	2	86	4		2
November 20 0800-1200	Gizzard shad	36	50-333	791		36
	Freshwater drum	27	57-160	284	1	26
	Bluegill	17	44-85	102	2	15
	Emerald shiner	3	58-84	7		3
	White crappie	3	72-189	126		3
	Channel catfish	1	98	9		1
	White bass	1	106	12		1
1200-1600	Bluegill	17	35-73	61	2	15
	Freshwater drum	11	69-169	204	1	10
	Gizzard shad	10	61-187	144		10
	White crappie	3	58-86	14	1	2
	Sauger	1	194	56		1
	Emerald shiner	1	80	4		1
	White bass	1	102	14		1
	Rock bass	1	80	12		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
August 28 1600-2000	Gizzard shad	2	47-74	7		2
	White crappie	2	68-87	13		2
	Freshwater drum	1	100	12		1
	Bluegill	1	45	2		1
	Channel catfish	1	114	14		1
	Emerald shiner	1	49	1		1
2000-2400	Gizzard shad	7	50-102	26		7
	Freshwater drum	7	41-110	30		7
	Bluegill	4	42-51	10		4
	Channel catfish	3	48-87	11	1	2
	Emerald shiner	2	36-40	2		2
August 29 2400-0400	Freshwater drum	9	45-125	61		9
	Channel catfish	4	55-93	22		4
	Silver chub	1	136	26		1
0400-0800	Freshwater drum	5	52-88	19		5
	Channel catfish	4	47-86	11		4
	Bluegill	3	42-50	3		3
	Gizzard shad	2	52-7	7		2
	Mimic shiner	1		4		1
0800-1200	Channel catfish	4	58-81	10	1	3
	Bluegill	4	42-53	6		4
	Gizzard shad	2	55-67	2		2
	Longnose gar	1	287	39		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
September 4						
0800-1200	Freshwater drum	5	58-71	18		5
	Channel catfish	6	55-89	19	1	5
	Bluegill	4	42-85	19		4
	Emerald shiner	2	40-50	5		2
	Silver chub	1	74	10		1
	Skipjack herring	1	123	12		1
	White crappie	1	67	4		1
1200-1600	Channel catfish	6	49-97	20	1	5
	Freshwater drum	3	78-132	35		3
	Emerald shiner	2	39-62	5		2
1600-2000	Channel catfish	4	44-72	11	1	3
	Bluegill	3	41-49	8		3
	Freshwater drum	2	97-110	29		2
	Silver chub	2	60-133	27		2
	Emerald shiner	1	60	2		1
2000-2400	Freshwater drum	31	52-80	94		31
	Gizzard shad	29	66-121	216		29
	Emerald shiner	22	31-71	50		22
	Channel catfish	8	46-122	30		8
	White crappie	4	58-65	14		4
	Silver chub	3	47-133	28		3
	Bluegill	1	49	2		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 5 2400-0400	Gizzard shad	40	50-108	212		40
	Freshwater drum	34	47-100	126		34
	Emerald shiner	18	41-72	32		18
	Channel catfish	10	60-97	34	2	8
	Black crappie	3	47-64	7		3
	White crappie	2	49-53	4		2
	Silver chub	2	66-67	6		2
	Smallmouth bass	1	47	1		1
	Flathead catfish	1	60	3		1
0400-0800	Freshwater drum	20	52-75	66		20
	Emerald shiner	10	38-72	21		10
	Channel catfish	7	65-99	35	2	5
	Gizzard shad	7	65-100	64		7
	Mimic shiner	3	61-77	11		3
	Silver chub	1	126	20		1
	Black crappie	1	55	3		1
	Minnow	1		2		1
0800-1200	Gizzard shad	7	66-118	51		7
	Channel catfish	6	46-101	30		6
	Freshwater drum	4	60-120	34		4
	Mimic shiner	4	53-55	9		4
September 11 0800-1200	Freshwater drum	8	62-117	58		8
	Channel catfish	7	48-134	38	1	6
	Emerald shiner	5	66-104	33		5
	Flathead catfish	1		12		1
	Gizzard shad	1	105	12		1
	Bluegill	1	40	2		1
	Silver chub	1	162	38		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 11 1200-1600	Freshwater drum	5	93-127	65		5
	Emerald shiner	2	45-94	8		2
	Minnow	2		4		2
	Channel catfish	1	b	13		1
	Flathead catfish	1	72	5		1
	Bluegill	1	50	2		1
1600-2000	Freshwater drum	5	57-125	46		5
	Channel catfish	5	45-113	26	1	4
	Emerald shiner	5	45-75	15		5
	Bluegill	2	47-48	6		2
2000-2400	Emerald shiner	122	38-97	244		122
	Freshwater drum	39	57-142	267		39
	Channel catfish	16	50-257	190	1	15
	Gizzard shad	9	84-118	134		9
	Silver chub	4	62-78	17	1	3
	Flathead catfish	4	87-135	70	3	1
	Mimic shiner	3	60-78	6		3
	Skipjack herring	1	119	16		1
September 12 2400-0400	Emerald shiner	37	34-100	80		37
	Freshwater drum	31	39-123	200		31
	Channel catfish	11	56-111	51	2	9
	Gizzard shad	2	95-98	24		2
	Mimic shiner	2	62-65	4		2
	Silver chub	2	62-66	4		2
	Skipjack herring	1	98	9		1
	Black crappie	1	60	3		1
	Mooneye	1	297	267		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 12 0400-0800	Emerald shiner	31	40-82	62		31
	Freshwater drum	16	66-124	118		16
	Minnow	8	57	16		8
	Mimic shiner	6	41-77	8		6
	Gizzard shad	6	56-144	51		6
	Channel catfish	4	64-320	250		4
	White crappie	1	60	3		1
0800-1200	Channel catfish	12	49-120	86		12
	Emerald shiner	6	46-74	1		6
	Freshwater drum	5	57-124	30		5
	Minnow	4		8		4
	Crappie (*Pomoxis*)	2	67-72	10		2
	Sauger	2	237-367	528		2
	Flathead catfish	1	135	36		1
	Mimic shiner	1	84	7		1
September 18 0800-1200	Channel catfish	6	51-335	268		6
	Freshwater drum	4	85-95	31		4
	Emerald shiner	1	61	2		1
	Silver chub	1		6		1
	Flathead catfish	1	135	23		1
1200-1600	Channel catfish	4	50-65	20	4	
	Freshwater drum	2	94-157	40		2
	Gizzard shad	1	95	26		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 18 1600-2000	Emerald shiner	19	42-69	50		19
	Channel catfish	31	65-135	30		3
	Silver chub	3	77-81	12		3
	Freshwater drum	1	95	8		1
	Skipjack herring	1	125	16		1
2000-2400	Freshwater drum	18	56-115	118	1	17
	Emerald shiner	14	47-78	30		14
	Channel catfish	9	57-312	429		9
	Sivler chub	3	59-65	7		3
	Gizzard shad	1	62	3		1
	Flathead catfish	1	b	7		1
September 19 2400-0400	Freshwater drum	14	45-90	70		14
	Emerald shiner	8	51-79	17		8
	Channel catfish	7	55-324	286		7
	Bluegill	1	58	3		1
	Silver chub	1	81	5		1
0400-0800	Freshwater drum	6	52-142	53		6
	Emerald shiner	6	43-82	17		6
	Channel catifsh	4	50-100	15		4
	Flathead catfish	1	144	41		1
	Silver chub	1	68	4		1
1000-1230	Channel catfish	3	69-114	26		3
	Freshwater drum	2	46	6		2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 25						
1200-1600	Emerald shiner	3	44-73	4		3
	Freshwater drum	1	64	3		1
	Channel catfish	1	238	83		1
1645-2230	Emerald shiner	33	49-74	78		33
	Freshwater drum	4	49-98	20		4
	Channel catfish	3	59-73	8		3
	Bluegill	1	182	132		1
	Longear sunfish	1	148	74		1
2230-2400	Freshwater drum	2	50	2		2
	Emerald shiner	2	62-68	6		2
	White crappie	1	60	3		1
	Channel catfish	1	87	7		1
September 26						
2400-0400	Freshwater drum	10	49-112	37		10
	Emerald shiner	7	46-77	16		7
	Channel catfish	1	60	2		1
	Black crappie	1	75	4		1
0400-0800	Emerald shiner	9	41-103	23		9
	Freshwater drum	4	61-91	15		4
	Channel catfish	2	b	12		2
	Gizzard shad	2	121-160	61		2
	Mimic shiner	1	41	1		1
	Flathead catfish	1	b	29		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
September 26 0800-1200	Emerald shiner	16	45-70	22		16
	Gizzard shad	11	122-148	294		11
	Channel catfish	4	56-156	26		5
	Freshwater drum	4	59-105	29		4
	Silver chub	2	84-144	34		4
	Black crappie	1	72	4		2
						1
1200-1600	Gizzard shad	7	104-154	179		7
	Emerald shiner	1	65	3		1
	Flathead catfish	1	115	16		1
	Silver chub	1	137	25		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978 October 2						
0800-1200	Channel catfish	4	54-110	22		4
	Emerald shiner	4	57-79	8		4
	Freshwater drum	1	47	2		1
1200-1600	Gizzard shad	7	115-192	267	1	6
	Channel catfish	3	246-321	361		3
	Emerald shiner	3	48-75	5		3
1600-2000	Emerald shiner	35	51-82	136		35
	Gizzard shad	10	140-210	498		10
	Channel catfish	3	72-115	20	1	2
	Skipjack herring	2	140-263	208		1
	Freshwater drum	1	b	4		1
	Bluegill	1	63	5		1
2000-2400	Emerald shiner	18	55-112	61		18
	Freshwater drum	9	47-67	17		9
	Channel catfish	2	71-130	13		2
	Silver chub	1	b	4		1
	Bluegill	1	51	3		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
October 3 2400-0400	Freshwater drum	6	53-247	170		6
	Emerald shiner	5	51-83	16		5
	Channel catfish	2	54-318	227	1	1
	White crappie	2	60-64	6		2
	Bluegill	1	74	8		1
	Gizzard shad	1	104	12		1
	Silver chub	1	70	3		1
0400-0800	Emerald shiner	26	52-112	74		26
	Silver chub	2	65-79	2		2
	Gizzard shad	4	85-197	148		4
	Channel catfish	4	88-278	164		4
	Freshwater drum	3	52-76	9		3
	Flathead catfish	1	165	56		1
0800-1200	Emerald shiner	3	64-72	11		3
	Gizzard shad	1	178	60		1
	Freshwater drum	1	85	8		1
October 9 0800-1200	Emerald shiner	43	54-104	131		43
	Freshwater drum	8	41-152	103		8
	Gizzard shad	4	92-106	99		4
	Channel catfish	3	62-424	600	1	2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
October 9						
1200-1600	Emerald shiner	12	57-81	32		12
	Minnow (Cyprinidae)	4	b	8		4
	Freshwater drum	3	b	39		3
	Gizzard shad	2	103-165	64		2
	Channel catfish	1	69	4		1
	Bluegill	1	77	8		1
	Skipjack herring	1	241	144		1
1600-2000	Emerald shiner	30	50-83	139		30
	Freshwater drum	6	45-159	153		6
	Gizzard shad	5	106-190	238	5	
	Channel catfish	3	76-155	31		3
	Minnow (Cyprinidae)	2	b	4		2
2000-2400	Emerald shiner	49	56-85	150	1	48
	Freshwater drum	38	44-265	444		38
	Gizzard shad	4	62-210	136		4
	Channel catfish	4	66-112	27	1	3
October 10						
2400-0400	Freshwater drum	31	45-247	370		31
	Emerald shiner	29	52-84	83		29
	Gizzard shad	4	101-244	254		3
	Minnow (Cyprinidae)	3	b	6		3
	Skipjack herring	1	195	64		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
October 10 0400-0800	Emerald shiner	34	49-89	101		34
	Freshwater drum	16	49-113	69		16
	Gizzard shad	5	84-181	128		5
	Channel catfish	3	60-61	6		3
	Minnow (Cyprinidae)	3	b	6		3
0800-1200	Emerald shiner	6	60-77	19		6
	Freshwater drum	5	57-220	176		5
	Gizzard shad	4	95-195	222		4
	Channel catfish	3	71-115	21	1	2
October 16 0800-1200	Freshwater drum	131	48-150	425		131
	Emerald shiner	46	42-99	142		46
	Gizzard shad	7	94-195	166		7
	Channel catfish	6	51-140	57	3	3
	Bluegill	1	51	2		1
	White crappie	1	82	5		1
	White bass	1	215	139		1
	Sauger	1	274	186		1
	Silver chub	1	66	5		1
1200-1600	Emerald shiner	11	50-73	25		11
	Freshwater drum	7	53-74	13		7
	Gizzard shad	4	179-204	317		4
	Channel catfish	3	74-213	179	1	2
	Bluegill	2	47-196	174	1	1
	Silver chub	2	148-151	56		2

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
October 16 1600-2000	Emerald shiner	25	52-89	80	2	23
	Freshwater drum	20	50-112	94		20
	Gizzard shad	9	112-205	346	1	8
	Channel catfish	5	76-415	850	2	3
	Bluegill	3	48-58	6	2	1
	Silver chub	1	72	4	1	
	Black crappie	1	97	10		1
2000-2400	Freshwater drum	52	54-174	295		52
	Emerald shiner	38	42-80	108		38
	Gizzard shad	5	118-181	177		5
	Channel catfish	2	60-101	10	1	1
	Longnose gar	1	355	90	1	
	Bluegill	1	55	3		
	Warmouth	1	65	5	1	
October 17 2400-0400	Emerald shiner	27	53-93	105		27
	Freshwater drum	23	45-164	140	3	20
	Gizzard shad	5	91-140	88		5
	Channel catfish	2	68-218	86	1	1
	Longnose gar	1	399	114	1	1
	White bass	1	192	100		1
	Bluegill	1	48	2		1
0400-0800	Emerald shiner	40	52-85	129		40
	Freshwater drum	9	45-65	17		9
	Silver chub	4	75-91	20	1	3
	Gizzard shad	4	110-131	78		4
	White crappie	1	61	3		1
	Minnow (Cyprinidae)	1	b	2		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
October 17 0800-1200	Gizzard shad	22	62-228	1,045	4	18
	Emerald shiner	20	62-85	54		20
	Bluegill	3	52-67	14	3	
	Freshwater drum	2	62-103	17		2
	Skipjack herring	2	174-265	227		2
	Channel catfish	1	69	4		1
	Largemouth bass	1	115	18	1	
	White crappie	1	74	4		1
October 23 0800-1200	Gizzard shad	7	83-214	244		7
	Freshwater drum	5	55-128	60		5
	Emerald shiner	3	59-80	4		3
	Minnow (Cyprinidae)	1		2		1
1200-1600	Gizzard shad	5	80-202	167		5
	Emerald shiner	2	68-80	8		2
	Freshwater drum	2	67-74	8		2
1600-2000	Gizzard shad	8	66-204	337		8
	Freshwater drum	3	50-100	16		3
	Emerald shiner	3	59-79	11		3
	Bluegill	2	41-56	6		2
	Minnow (Cyprinidae)	2	65	4		2
	White crappie (*Pomoxis*)	1	71	4	1	
	Longnose gar	1	418	150		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
2000-2400	Gizzard shad	9	76-174	169		9
	Freshwater drum	6	60-69	14		6
	Emerald shiner	3	60-78	9		3
		2	78-80	10		2
	Bluegill	1	54	3	1	
	Skipjack herring	1	231	100		1
October 24 2400-0400	Gizzard shad	12	84-180	136		12
	Freshwater drum	3	56-90	10		3
	Emerald shiner	2	45-71	4		2
	Bluegill	1	76	10		1
	Quillback	1	94	8		1
0400-0800	Gizzard shad	8	76-176	144		8
	Emerald shiner	5	50-77	12		5
0800-1200	Gizzard shad	4	82-205	114		4
	Emerald shiner	2	67-81	6		2
	Black crappie	1	80	7		1
	Skipjack herring	1	258	151		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978 November 6						
0800-1200	Gizzard shad	14	65-342	601		14
	Freshwater drum	4	62-131	38		4
	White crappie	2	75-87	14		2
	White bass	1	113	18		1
	Minnow (Cyprinidae)	1	b	2		1
1200-1600	Gizzard shad	11	74-203	387		11
	White crappie	2	66-76	7	1	1
	Bluegill	1	62	4		1
	Flathead catfish	1	97	9		1
1600-2000	Gizzard shad	41	92-259	1,576	1	40
	Freshwater drum	7	55-120	54		7
	Emerald shiner	1	78	4		1
	Silver chub	1	73	3		1
2000-2400	Gizzard shad	32	86-240	1,072		32
	Freshwater drum	17	55-368	752	3	14
	White bass	1	199	90	1	
	Flathead catfish	1	130	26	1	
	Bluegill	1	63	4		1
	Longear sunfish	1	64	4	1	
	White crappie	1	95	10		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
November 7 2400-0400	Gizzard shad	34	23-212	908		34
	Freshwater drum	7	55-114	43		7
	Silver chub	1	90	9		1
	Walleye	1	444	860	1	
	Skipjack herring	1	272	191		1
	Emerald shiner	1	69	5		1
0400-0800	Gizzard shad	56	55-227	976		56
	Freshwater drum	7	58-237	182		7
	White crappie	4	80-292	524	1	3
	Emerald shiner	2	86	4		2
November 20 0800-1200	Gizzard shad	36	50-333	791		36
	Freshwater drum	27	57-160	284	1	26
	Bluegill	17	44-85	102	2	15
	Emerald shiner	3	58-84	7		3
	White crappie	3	72-189	126		3
	Channel catfish	1	98	9		1
	White bass	1	106	12		1
1200-1600	Bluegill	17	35-73	61	2	15
	Freshwater drum	11	69-169	204	1	10
	Gizzard shad	10	61-187	144		10
	White crappie	3	58-86	14	1	2
	Sauger	1	194	56		1
	Emerald shiner	1	80	4		1
	White bass	1	102	14		1
	Rock bass	1	80	12		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
November 20 1600-2000	Freshwater drum	99	55-250	924	1	98
	Gizzard shad	19	76-202	421		19
	Emerald shiner	4	62-80	11		4
	White bass	3	106-112	46		3
	Bluegill	3	43-113	37	1	2
	Channel catfish	2	164-221	145	1	1
	Sunfish (Centrarchidae)	2	45	1	1	1
2000-2400	Freshwater drum	62	51-165	564	5	57
	Gizzard shad	19	58-233	482	1	18
	Emerald shiner	4	62-79	16		4
	Bluegill	2	37-67	9	1	1
	White bass	2	98-100	23		2
	Black crappie	1	65	4		1
	Sucker (Catostomidae)	1	78	5		1
November 21 2400-0400	Freshwater drum	31	49-161	240	3	28
	Gizzard shad	27	56-354	856		27
	Emerald shiner	2	72-84	6	1	1
	Bluegill	2	47-71	8		2
	White crappie	1	82	4		1
	White bass	1	109	16		1
0400-0800	Gizzard shad	49	57-309	703		49
	Freshwater drum	14	62-122	137		14
	Bluegill	5	48-184	168	1	4
	Emerald shiner	3	51-74	6		3
	Carp	2	433-456		2	

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
November 21 0800-1200	Gizzard shad	23	52-152	170		23
	Freshwater drum	11	66-158	162		11
	Bluegill	3	82-130	66	1	2
	White bass	1	110	18		1
	Emerald shiner	1	78	4		1
	Black carppie	1	82	8		1
	Minnow (Cyprinidae)	1	85	4		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
December 4						
1200-1545	Gizzard shad	107	53-236	1,056		107
	Freshwater drum	99	58-140	1,061		99
	Emerald shiner	11	70-122	69		11
	Bluegill	5	44-130	54		5
	White bass	1	109	14		1
	Sauger	1	141	20		1
	Channel catfish	1	85	8		1
1545-2000	Gizzard shad	87	53-356	1,710		87
	Freshwater drum	71	60-286	1,037		71
	Bluegill	5	42-154	102		5
	Emerald shiner	4	38-103	5		4
	White bass	2	105	21		2
2000-2400	Freshwater drum	145	49-155	1,330	2	143
	Gizzard shad	129	51-229	2,298		129
	Emerald shiner	9	68-110	53		9
	White bass	3	104-114	43		3
December 5						
2400-0400	Gizzard shad	122	52-340	2,062	1	121
	Freshwater drum	125	51-165	1,350		125
	White bass	7	102-196	181		7
	Bluegill	6	49-141	76		6
	Emerald shiner	4	76-108	17		4
	Channel catfish	2	190-202	84	2	
	Silver chub	1	72	4		1
	Golden redhorse	1	80	6		1
	Quillback	1	87	9		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1978						
December 5						
0400-0800	Gizzard shad	175	55-297	2,557		175
	Freshwater drum	139	75-131	1,184		139
	Emerald shiner	7	69-114	22		7
	White bass	4	101-119	51		4
	Bluegill	3	35-62	8		3
	Black crappie	1	95	10		1
0800-1200	Gizzard shad	120	50-332	3,398		120
	Freshwater drum	105	54-152	1,164		105
	White bass	7	98-198	224		7
	Emerald shiner	5	82-107	37		5
	Bluegill	4	45-93	27		4
	Logperch	1	89	6		1
December 18						
0800-1200	Gizzard shad	202	57-262	4,463		202
	Freshwater drum	63	59-160	645		63
	White bass	6	97-202	168		6
	Bluegill	5	47-129	63		5
	Emerald shiner	2	90-97	9		2
	Quillback	2	88-93	18		2
	Carp	2	59-67	8		2
	Longnose gar	1	535	322		1
	Black crappie	1	62	4		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
December 18 1200-1600	Gizzard shad	73	57-232	1,856	1	72
	Freshwater drum	38	67-274	1,051	2	36
	White bass	3	115-283	431		3
	Bluegill	3	47-67	11		3
	Sauger	1	405	539	1	
	Emerald shiner	1	100	9		1
	White crappie	1	106	14		1
1600-2000	Gizzard shad	202	54-234	3,548		202
	Freshwater drum	47	64-136	512		47
	White bass	7	102-308	721		7
	Sauger	6	294-402	1,936		6
	Emerald shiner	5	70-83	24		5
	Channel catfish	2	106-264	140		2
	Spotted sucker	1	129	24		1
	Warmouth	1	95	22		1
	Silver chub	1	84	6		1
	Quillback	1	b	4		1
	Bluegill	1	50	3		1
2000-2400	Gizzard shad	191	55-303	4,045		191
	Freshwater drum	55	55-427	1,690		55
	White bass	6	105-192	241		6
	Bluegill	4	59-91	23		4
	Emerald shiner	2	80-100	11		2
	Minnow (Cyprinidae)	1	b	2		1
	Golden redhorse	1	292	282		1
	Sunfish (*Lepomis*)	1	63	4		1
	Rock bass	1	52	3		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
December 19 2400-0400	Gizzard shad	181	59-292	4,295		181
	Freshwater drum	26	58-134	324		26
	Sauger	5	188-385	893	1	4
	White bass	4	96-198	141		4
	Emerald shiner	4	48-68	8		4
	Bluegill	3	35-135	47	1	2
	Black crappie	2	86-140	45		2
	Brown bullhead	2	145-217	162	2	
	Channel catfish	1	68	3		1
	Warmouth	1	48	3		1
	Carp	1	456	1,180		1
0400-0800	Gizzard shad	197	61-310	3,480	197	
	Freshwater drum	40	52-133	465		40
	White bass	6	98-176	131	1	5
	Emerald shiner	5	43-111	14		5
	Bluegill	4	45-90	23		4
	Carp	2	68-69	11		2
	Silver chub	1	80	5		1
	Crappie (*Pomoxis*)	1	70	5		1
	Warmouth	1	64	7		1
0800-1200	Gizzard shad	220	60-315	5,564		220
	Freshwater drum	64	73-118	519		64
	Emerald shiner	6	68-94	28		6
	Sauger	2	194-283	229		2
	White bass	2	119-188	112		2
	Channel catfish	1	329	204		1
	Bluegill	1	52	3		1
	Sunfish (*Lepomis*)	1	37	1		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1979						
January 8						
0800-1325	Gizzard shad	36	95-180	589		36
	Freshwater drum	29	70-315	798	1	28
	Emerald shiner	3	70-88	12		3
	Channel catfish	1	63	3		1
1420-1600	Gizzard shad	10	109-138	186	1	9
	Freshwater drum	6	75-110	52	1	5
	White bass	1	142	37	1	
	Emerald shiner	1	103	10		1
	Channel catfish	1	71	2		1
1600-2000	Freshwater drum	10	99-173	180		10
	Gizzard shad	10	103-372	817	1	9
	Emerald shiner	1	78	4		1
	Yellow perch	1	93	8		1
2000-2400	Freshwater drum	6	105-132	97		6
	Gizzard shad	3	122-135	60		3
January 9						
2400-0400	Gizzard shad	6	104-123	84		6
	Freshwater drum	5	105-163	114		5
	Yellow perch	1	69	4		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
January 22						
0800-1200	Gizzard shad	9	124-207	471	2	7
1200-1600	Gizzard shad	6	102-160	134		6
	Freshwater drum	3	65-125	40		3
	Bluegill	1	60	3	1	
	Channel catfish	1	79	4		1
1600-2000	Gizzard shad	19	100-205	784	2	17
	Sucker (Catostomidae)	1	233	160	1	
2000-2400	Gizzard shad	11	114-341	723	2	9
January 23						
2400-0400	Gizzard shad	14	115-216	662	7	7
0400-0800	Gizzard shad	8	116-260	402		8
	Channel catfish	1	54	1	1	
0800-1200	Gizzard shad	9	120-195	431		9
	Freshwater drum	1	136	30		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1979						
February 5						
1200-1600	Gizzard shad	50	105-316	3,961	1	57
	Emerald shiner	3	71-86	6	1	2
	Freshwater drum	2	113-117	27		2
	Sauger	1	269	154	1	
1600-2000	Gizzard shad	35	132-225	1,955	2	33
	Freshwater drum	1	120	23		1
	White crappie	1	191	112	1	
2000-2400	Gizzard shad	49	114-315	3,511	11	33
	Emerald shiner	1		2		1
February 6						
2400-0400	Gizzard shad	26	115-202	848	5	22
	Emerald shiner	1	79	3		1
	White bass	1	110	14		1
0800-1200	Gizzard shad	30	113-249	1,525		30
	Emerald shiner	4	74-76	9		4
	Channel catfish	1	73	4		1
	Freshwater drum	1	265	231		1
	Sauger	1	195	60		1
February 19						
0800-1200	Gizzard shad	93	132-288	5,964		93
	Emerald shiner	12	68-105	43		12
	Freshwater drum	7	109-125	106		7
	Channel catfish	1	61	2	1	
	White crappie	1	137	28		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
February 19						
1200-1600	Gizzard shad	61	132-295	4,031		61
	Emerald shiner	13	58-97	33		13
	Freshwater drum	2	116-159	60	1	
1600-2000	Gizzard shad	55	150-294	3,950		25
	Emerald shiner	18	57-108	52		13
	Freshwater drum	8	111-161	197		8
	Channel catfish	1	70	3		1
	Sauger	1	305	247	1	
	White bass	1	288	315	1	
	Silver chub	1	62	2		1
2000-2400	Gizzard shad	106	144-283	7,826		106
	Emerald shiner	10	59-89	29		10
	Freshwater drum	3	111-117	42		3
	Sauger	1	384	452	1	
February 20						
2400-0400	Gizzard shad	52	154-358	4,084	1	51
	Emerald shiner	11	50-94	36		11
	Freshwater drum	4	106-158	117		4
	Minnow (Cyprinidae)	2	71-84	14		2
	Sauger	2	226-340	457	1	1
	Mooneye	1	144	27		1
	White bass	1	274	258	1	
0400-0800	Gizzard shad	48	148-321	3,018	8	46
	Emerald shiner	9	61-151	56		2
	Freshwater drum	2	116-151	56		2
0800-1200	Gizzard shad	39	157-232	2,579		39
	Emerald shiner	10	66-86	26	1	9
	freshwater drum	6	88-215	202		6

Table 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
1979						
March 5						
0800-1200	Gizzard shad	1	176	51		1
1200-1600	No fish taken					
1600-2000	Gizzard shad	2	164-166	94		2
	Yellow perch	1	76	4		1
	Bluegill	1	122	36		1
2000-2400	Yellow perch	1	190	86	1	
2400-0400	Golden shiner	1	72	3		1
	Emerald shiner	1	78	4		1
	Channel catfish	1	68	3	1	
	Freshwater drum	1	116	17		1
0400-0800	Yellow perch	1	158	40		1
	Freshwater drum	1	134	27		1
0800-1200	Gizzard shad	2	173-175	103		2
	Emerald shiner	1	80	4		1
March 6						
2400-0400	Channel catfish	1	68	3	1	
	Freshwater drum	1	116	17		1
	Emerald shiner	1	78	4		1
	Golden shiner	1	72	3		1
March 19						
0800-1200	Freshwater drum	7	109-272	338		7
	Gizzard shad	4	169-310	418		4
	Channel catfish	2	92-115	15		2
	Emerald shiner	2	43-92	7		2
	Golden shiner	1	76	4		1
	Sauger	1	324	281		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
March 19						
1220-1600	Channel catfish	3	110-116	35		3
	Freshwater drum	3	110-169	106		3
	Gizzard shad	2	121-137	40		2
	Longnose gar	1	553	358	1	
	Sauger	1	260	132		1
	River carpsucker	1	304	385		1
1600-2000	Freshwater drum	3	151-162	110		3
	Channel catfish	2	89-140	24		2
	Gizzard shad	2	184-196	122		2
	Mooneye	2	168-169	84		2
	Sauger	1	280	161		1
	Brown bullhead	1	220	260		1
	Black crappie	1	162	57		1
2000-2400	Gizzard shad	3	85-135	38		3
	Golden shiner	3	80-162	63	1	2
	Channel catfish	2	70-74	6		2
	Freshwater drum	2	80-114	20		2
	Quillback	1	412	764	1	
	Logperch	1	141	21	1	
March 20						
2400-0400	Gizzard shad	4	117-175	130		4
	Freshwater drum	3	110-123	44		3
	Golden shiner	2	89-90	12	2	
	Channel catfish	1	100	6	1	
	Quillback	1	103	12		1
	Yellow perch	1	114	56		

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
March 20						
0400-0800	Golden shiner	5	89-105	46	1	4
	Gizzard shad	4	106-212	165	1	3
	Freshwater drum	2	94-114	23		2
	White crappie	1	142	32		1
	Sunfish (*Lepomis*)	1	49	1		1
0800-1200	Freshwater drum	11	99-320	974		11
	Yellow perch	1	161	48		1
	Logperch	1	127	17		1
	Sauger	1	284	185		1
	Gizzard shad	1	261	69		1
March 26						
0800-1200	Freshwater drum	1	124	17		1
	White crappie	1	116	15	1	
	White bass	1	214	132	1	
	Sunfish (Centrarchidae)	1	b	6		1
1200-1600	Gizzard shad	3	97-225	179		3
	Freshwater drum	1	410	787	1	
	Golden shiner	1	85	5	1	
	Bluegill	1	88	6	1	
	Black crappie	1	136	27	1	
	White crappie	1	150	36	1	
1600-2000	Gizzard shad	7	85-191	221		7
	Freshwater drum	2	122-241	166		2
	Black crappie	1	211	141	1	
	White crappie	1	120	20		1
	Golden shiner	1	78	4		1
	Emerald shiner	1	78	3		1
	Silver chub	1	99	10		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
March 26 2000-2400	Gizzard	7	85-183	150		7
	Freshwater drum	2	105-113	22		2
	Bluegill	2	115-124	60	1	
	White crappie	1	143	30	1	1
	Yellow perch	1	142	53	1	
	Golden shiner	1	76	8		1
	Black crappie	1	160	49	1	
0800-1200	Gizzard shad	4	87-99	24		4
	Freshwater drum	2	110-124	23	1	
	Bluegill	1	137	38	1	
	Black crappie	1	159	56	1	
	Yellow perch	1	196	102		2
	Silver chub	1	71	4		1
March 27 2400-0400	Gizzard shad	3	93-199	103	1	2
	Freshwater drum	2	130-180	78		2
	Bluegill	1	109	22	1	
0400-0800	Gizzard shad	3	77-93	16		3
	Freshwater drum	2	97-142	38		2
	Sauger	1	222	173		1
	Silver chub	1	102	8	1	
	Yellow perch	1	146	34	1	
	Black crappie	1	132	28	1	
	Channel catfish	1	95	6	1	
	Emerald shiner	1	76	2		1

TABLE 1 (Continued)

Date & Time	Taxon	Number	Total Length Range (mm)	Weight (g)	Alive	Dead
March 27 0800-1200	Gizzard shad	4	87-98	24		4
	Freshwater drum	2	40-124	23		2
	Silver chub	1	71	4		1
	Bluegill	1	137	38	1	
	White crappie	1	159	56	1	
	Yellow perch	1	196	102	1	
April 2 0800-1200	Gizzard shad	2	227-255	258		2
	Bluegill	2	107-137	73		1
	White crappie	1	158	43	1	
	Emerald shiner	1	85	5	1	1
	Sauger	1	366	429		1
1200-1600	Gizzard shad	2	148-182	48	1	1
	Emerald shiner	2	72-87	7		2
	Freshwater drum	1	111	10		1
	Mooneye	1	243	129		1
	Spotted sucker	1	73	3		1
1600-2000	Freshwater drum	6	82-232	219		6
	Bluegill	6	79-135	146		6
	Channel catfish	2	76-103	12	1	1
	Gizzard shad	2	105-195	72		2
	Golden shiner	2	82-91	8		2
	Emerald shiner	2	70-75	5		2

TABLE 2

NUMBERS OF FISH IMPINGED AT THE KYGER CREEK STATION CONSIDERED DEAD PRIOR TO BECOMING IMPINGED

Date and Time	Taxon	Number
April 11, 1978		
0400-0800	Unidentifiable	1
April 17		
0800-1200	Freshwater drum	1
	Unidentifiable	1
0400-0800	Freshwater drum	2
	Total	5
May 1, 1978		
0800-1200	Sunfish (Centrarchidae)	1
May 8		
1600-2000	Bluegill	1
May 15		
0880-1200	Freshwater drum	1
1600-2000	Bluegill	1
May 22		
0800-1200	Golden redhorse	1
1200-1600	Bluegill	1
1600-2000	Rainbow trout	1
May 29		
1200-1600	Emerald shiner	1
1600-2000	Sauger	1
2000-2400	Sauger	1

TABLE 2 (Continued)

Date and Time	Taxon	Number
May 30		
0400-0800	Sauger	1
	Bluegill	1
0800-1200	Freshwater drum	1
	Total	13
June 5, 1978		
0800-1200	Bluegill	1
2000-2400	Sauger	1
June 6		
0400-0800	Sauger	2
0800-1200	Emerald shiner	1
	Freshwater drum	1
June 12		
0800-1200	Silver chub	1
1200-1600	Emerald shiner	1
1600-2000	Sauger	1
2000-2400	Sauger	2
	Channel catfish	1
June 13		
0800-1200	Sauger	1
June 19		
0800-1200	Freshwater drum	1
	Unidentifiable	1
1200-1600	Emerald shiner	1
June 26		
1600-2000	Freshwater drum	1
	Total	17

TABLE 2 (Continued)

Date and Time	Taxon	Number
July 3, 1978		
0800-1200	Unidentifiable	1
July 4		
0800-1200	Redhorse (*Moxostoma*)	1
July 10		
1600-2000	White crappie	1
	Unidentifiable	1
July 11		
0800-1200	Gizzard shad	1
July 17		
1600-2000	Unidentifiable	1
2000-24-0	Emerald shiner	1
July 24		
0800-1200	Gizzard shad	1
1600-1000	Gizzard shad	1
2000-2400	Emerald shiner	1
July 25		
0800-1200	Freshwater drum	1
July 31		
2000-2400	Emerald shiner	1
	Crappie (*Pomoxis*)	1
	Total	13

TABLE 2 (Continued)

Date and Time	Taxon	Number
August 1, 1978		
0800-1700	Sunfish (Centrarchidae)	1
	Herring (Clupeidae)	1
August 7		
0800-1200	Sunfish (Centrarchidae)	1
	Gizzard shad	5
1200-1600	Gizzard shad	9
	Freshwater drum	1
	Emerald shiner	1
	Unidentifiable	1
1600-1000	Gizzard shad	18
2000-2400	Gizzard shad	7
	Unidentifiable	3
	Freshwater drum	1
	Goldeye	1
August 8		
240-0400	Gizzard shad	14
	Emerald shiner	1
0400-0800	Gizzard shad	7
	Bluegill	1
	Unidentifiable	1
	Sunfish (Centrarchidae)	2
0800-1200	Gizzard shad	11
	Channel catfish	1
August 14		
0800-1200	Unidentifiable	4
	Freshwater drum	2
	Emerald shiner	1
	Mimic shiner	1
1200-1600	Freshwater drum	1
	Emerald shiner	1
1600-2000	Sauger	1
2000-2400	Gizzard shad	13
	Sunfish (Centrarchidae)	2

TABLE 2 (Continued)

Date and Time	Taxon	Number
August 15		
2400-0400	Gizzard shad	31
	Unidentifiable	2
	Emerald shiner	1
	Sunfish (Centrarchidae)	1
	Brown bullhead	1
0400-0800	Unidentifiable	2
	Sunfish (Centrarchidae)	1
0800-1200	Gizzard shad	53
	Crappie (*Pomoxis*)	2
	Unidentifiable	1
August 21		
0800-1200	Gizzard shad	8
	Channel catfish	2
	Minnow (*Cyprinidae*)	1
	Minnow (*Cyprinidae*)	1
2000-2400	Gizzard shad	3
	Minnow (*Cyprinidae*)	1
August 28		
1200-1600	Unidentifiable	3
	Catfish (*Ictalurus*)	2
1600-2000	Unidentifiable	1
	Emerald shiner	2
2000-2400	Gizzard shad	1
August 29		
0400-0800	Channel catfish	1
	Minnow (*Cyprinidae*)	1
	Total	236
September 4, 1978		
1200-1600	Unidentifiable	2
	Freshwater drum	1
	Emerald shiner	1
	Crappie (*Pomoxis*)	1

TABLE 2 (Continued)

Date and Time	Taxon	Number
1600-200	Freshwater drum	3
	Crappie (*Pomoxis*)	1
	Unidentifiable	1
2000-2400	Minnow (Cyprinidae)	2
September 5		
2400-0400	Minnow (Cyprinidae)	1
	Crappie (*Pomoxis*)	1
0800-1200	Channel catfish	1
	Freshwater drum	1
September 11		
0800-1200	Minnow (Cyprinidae)	1
	Unidentifiable	1
1600-2000	Freshwater drum	1
September 12		
2400-0400	Gizzard shad	1
	Channel catfish	1
	Unidentifiable	1
0400-0800	Channel catfish	1
0800-1200	Gizzard shad	1
September 18		
1200-1600	Gizzard shad	1
	Minnow (Cyprinidae)	1
1600-2000	Channel catfish	1
	Silver chub	1
September 25		
1200-1600	Minnow (Cyprinidae)	2
1645-2230	Emerald shiner	3
September 26		
0400-0800	Freshwater drum	1

TABLE 2 (Continued)

Date and Time	Taxon	Number
0800-1200	Channel catfish	2
	Freshwater drum	2
	Minnow (Cyprinidae)	1
	Silver chub	1
	Total	40
October 2, 1978		
1200-1600	Sunfish (Centrarchidae)	1
	Minnow (Cyprinidae)	1
2000-2400	Catfish (*Ictalurus*)	1
October 9		
0800-1200	Minnow (Cyprinidae)	2
	Freshwater drum	1
	Unidentifiable	1
1200-1600	Minnow (Cyprinidae)	6
	Gizzard shad	1
1600-2000	Unidentifiable	3
	Gizzard shad	1
	Minnow (Cyprinidae)	1
2000-2400	Unidentifiable	1
October 10		
2400-0400	Minnow (Cyprinidae)	1
0400-0800	Freshwater drum	1
October 16		
0800-1200	Channel catfish	1
1600-2000	Emerald shiner	2
	Freshwater drum	1
October 24		
2400-0400	Unidentifiable	2
	Longnose gar	1
	Total	29

TABLE 2 (Continued)

Date and Time	Taxon	Number
November 7, 1978		
2400-0400	Unidentifiable	2
0800-1200	American eel	1
November 20		
0800-1200	Gizzard shad	4
	Emerald shiner	3
	Carp	2
	Unidentifiable	2
	Sunfish (Centrarchidae)	1
	Total	15
December 4, 1978		
1200-1545	Gizzard shad	17
	Freshwater drum	9
	Minnow (Cyprinidae)	3
	Unidentifiable	2
	Sunfish (Centrarchidae)	1
1545-2000	Freshwater drum	5
	Gizzard shad	3
2000-2400	Gizzard shad	12
	Freshwater drum	10
December 5		
2400-0400	Gizzard shad	13
	Freshwater drum	8
0400-0800	Gizzard shad	6
0800-1200	Freshwater drum	5

TABLE 2 (Continued)

Date and Time	Taxon	Number
December 18		
0800-1200	Freshwater drum	78
	Gizzard shad	47
	Minnow (Cyprinidae)	3
	White bass	2
	Unidentifiable	2
	Percid (*Stizostedion*)	2
	Sunfish (*Micropterus*)	1
	Channel catfish	1
	Emerald shiner	1
	Redhorse (*Moxostoma*)	1
1200-1600	Gizzard shad	8
	Freshwater drum	2
1600-200	Gizzard shad	8
	Freshwater drum	4
2000-2400	Gizzard shad	4
	Freshwater drum	2
December 19		
2400-0400	Gizzard shad	16
	Freshwater drum	14
	White bass	1
	Channel catfish	1
	Largemouth bass	1
0400-0800	Gizzard shad	5
	Freshwater drum	4
0800-1200	Gizzard shad	5
	Freshwater drum	4
	Channel catfish	1
	Catfish (*Ictalurus*)	1
	Total	313
January 8, 1979		
0800-1225	Freshwater drum	3
2000-2400	Freshwater drum	1

TABLE 2 (Continued)

Date and Time	Taxon	Number
March 19		
0800-1220	Freshwater drum	5
	Gizzard shad	4
	Black crappie	1
1220-1600	Gizzard shad	1
1600-2000	Freshwater drum	4
	Gizzard shad	2
	Channel catfish	1
March 20		
0800-1200	Channel catfish	2
	Gizzard shad	1
	Freshwater drum	1
	River carpsucker	1
	Total	29

TABLE 1

INTAKE (I) AND DISCHARGE (D) WATER TEMPERATURE (F) DATA
KYGER CREEK STATION

MARCH 1978

Date	13										20										27									
Unit	1		2		3		4		5		1		2		3		4		5		1		2		3		4		5	
Time	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D
1200	41	51	38	46	41	51	OOS[a]	39	51	42	49	40	48	42	51	OOS	37	48	42	52	OOS	45	55	OOS	42	54				
1600	41	50	38	46	41	51	OOS	37	47	42	49	40	48	42	51	OOS	37	48	42	52	OOS	46	55	OOS	42	54				
2000	41	50	38	46	41	51	OOS	37	47	42	49	40	46	42	51	OOS	37	48	42	52	OOS	46	55	OOS	42	54				
2400	41	50	38	47	41	50	OOS	37	47	41	49	40	48	42	51	OOS	38	48	42	52	OOS	46	55	OOS	42	53				
0400	41	50	39	50	41	50	OOS	37	47	41	49	40	48	42	50	OOS	38	48	42	51	OOS	46	56	OOS	42	54				
0800	41	50	38	48	41	51	OOS	37	47	41	49	40	48	42	51	OOS	38	48	42	~~54~~ 51	OOS	46	56	OOS	42	60				
1200	41	50	38	48	41	51	OOS	39	47	41	49	40	48	42	51	OOS	38	48	42											

APRIL 1978

Date	3										10										17									
Unit	1		2		3		4		5		1		2		3		4		5		1		2		3		4		5	
Time	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D
0800											OOS	OOS	52	64	OOS	51	59	55	63	56	65	57	65	56	66	54	65			
1200	47	57	49	58	52	60	OOS	48	56	OOS	OOS	52	64	OOS	51	59	55	63	56	65	58	65	55	66	53	64				
1600	48	59	49	58	52	62	OOS	48	53	OOS	OOS	52	64	OOS	52	60	55	65	56	66	58	65	57	66	53	64				
2000	48	59	49	58	OOS		OOS	48	54	OOS	OOS	56	63	OOS	52	60	55	65	57	66	OOS		57	66	53	66				
2400	48	59	50	60	OOS		OOS	48	55	OOS	OOS	56	63	OOS	52	60	55	66	57	66	OOS		57	68	54	66				
0400	48	59	50	60	OOS		OOS	48	60	OOS	OOS	56	63	OOS	52	60	56	66	58	66	OOS		57	68	56	68				
0800	48	59	50	60	OOS		OOS	48	60	OOS	OOS	56	63	OOS	52	60	56	66	58	66	OOS		57	68	55	68				
1200	48	59	50	60	OOS		OOS	48	60	OOS	OOS	56	63	OOS	52	60														

APRIL 1978 / MAY 1978

Date	24										1										8									
Unit	1		2		3		4		5		1		2		3		4		5		1		2		3		4		5	
Time	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D	I	D
0800	54	64	55	64	57	66	OOS	53	65	55	66	57	67	59	69	56	67	OOS	57	68	60	70	OOS	60	71	OOS				
1200	53	64	55	64	57	66	OOS	53	65	55	66	57	67	OOS		57	68	OOS	57	68	60	70	OOS	60	71	OOS				
1600	53	63	55	66	58	68	OOS	53	66	55	66	57	67	OOS		57	68	OOS	57	68	60	69	~~OOS~~	60	70	OOS				
2000	53	65	55	66	~~58~~ 57	68	OOS	53	66	55	66	57	67	OOS		57	63	OOS	57	68	60	69	~~OOS~~	60	70	OOS				
2400	53	65	55	66	57	68	OOS	53	66	55	66	57	67	OOS		57	68	OOS	57	68	60	69	61	68	60	70	OOS			
0400	54	64	55	66	57	69	OOS	53	66	56	67	56	67	OOS		57	68	OOS	57	68	60	70	61	68	60	70	OOS			
0800	54	64	55	66	57	67	OOS	53	66	56	66	58	67	OOS		57	68	OOS	58	68	OOS		61	68	60	70	OOS			
1200	54	64	55	66	57	67	OOS	53	66	56	66	58	67	OOS		57	68	OOS												

[a] OOS - Unit out of service.

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TABLE 2

AIR TEMPERATURE (F) AND BAROMETRIC PRESSURE (INCHES OF Hg) DATA
KYGER CREEK STATION

MARCH 1978

Time	Date: 13 Temp	13 BP[a]	20 Temp	20 BP	27 Temp	27 BP
0800						
1200		29.7	73	29.5	39	29.4
1600	56		69	29.5	40	29.4
2000	55		57	29.5	39	29.5
2400	52		59	29.4	39	29.6
0400	53		59	29.4	40	29.6
0800	55		68	29.5	41	29.6
1200	61		63	29.3	50	29.6

APRIL 1978

Time	Date: 3 Temp	3 BP	10 Temp	10 BP	14 Temp	14 BP	24 Temp	24 BP
0800			65	29.3	50	29.6	56	29.6
1200	55	29.6	76	29.3	62	29.6	70	29.6
1600	74	29.7	84	29.2	64	29.5	75	29.5
2000	65	29.6	70	29.1	56	29.5	61	29.5
2400	56	29.6	68	29.1	53	29.5	56	29.4
0400	58	29.6	68	29.1	46	29.4	50	29.4
0800	64	29.6	72	29.0	46	29.2	50	29.4
1200	76	29.5	56	29.1			56	29.3

[a]BP - Barometric pressure.

TABLE 2 (Continued)

MAY 1978

Time	Date: 1 Temp	1 BP	8 Temp	8 BP	15 Temp	15 BP	22 Temp	22 BP	29 Temp	29 BP
0800	43	29.3	56	29.4	47	29.2	58	29.6	74	29.5
1200	55	29.4	60	29.3	53	29.2	73	29.6	80	29.5
1600	64	29.3	62	29.3	55	29.2	76	29.6	90	29.4
2000	55	29.4	64	29.2	55	29.2	72	29.6	73	29.4
2400	44	29.4	63	29.2	50	29.2	63	29.6	66	29.5
0400	38	29.4	61	29.2	44	29.2	57	29.6	66	29.4
0800	43	29.5	58	29.3	46	29.2	59	29.5	67	29.4
1200	56	29.5	75	29.2	56	29.3	62	29.5		

JUNE 1978

Time	Date: 5 Temp	5 BP	12 Temp	12 BP	19 Temp	19 BP	26 Temp	26 BP
0800	76	29.5	74	29.6	68	29.6	73	29.5
1200	78	29.5	85	29.6	77	29.7	86	29.6
1600	85	29.5	80	29.5	77	29.7	88	29.5
2000		29.5	68	29.5	77	29.6	87	29.5
2400	66	29.5	65	29.6	68	29.6	83	29.5
0400	61	29.5	59	29.6	65	29.6	78	29.5
0800	64	29.5	58	29.7	69	29.6	79	29.6
1200	80	29.6	64	29.7	85	29.6	93	29.6

TABLE 2 (Continued)

JULY 1978

Time	Date: 3 Temp	3 BP	10 Temp	10 BP	17 Temp	17 BP	24 Temp	24 BP	31 Temp	31 BP
0800			77	29.5	70	29.5	75	29.6	67	29.4
1200	82	29.3	83	29.6	78	29.5	75	29.6	72	29.4
1600	83	29.3	85	29.5	81	29.5	72	29.6	74	29.4
2000	75	29.4	78	29.5	76	29.5	73	29.6	67	29.5
2400	71	29.4	70	29.6	72	29.6	71	29.7	64	29.5
0400	68	29.4	65	29.6	59	29.6	68	29.5	57	29.5
0800	69	29.5	63	29.7	63	29.6	67	29.6	60	29.5
1200	71	29.5	70	29.7	85	29.6	75	29.6	75	29.6

AUGUST 1978

Time	Date: 7 Temp	7 BP	14 Temp	14 BP	21 Temp	21 BP	28 Temp	28 BP
0800	66	29.7	65	29.6	59	29.7	68	29.5
1200	69	29.7	79	29.6	72	29.8	77	29.5
1600	77	29.7	80	29.6	70	29.7	83	29.4
2000	72	29.7	71	29.6	67	29.7	75	29.4
2400	63	29.7	76	29.6	58	29.7	65	29.5
0400	58	29.7	63	29.6	55	29.7	62	29.4
0800	59	29.7		29.6	59	29.7	63	29.5
1200	78	29.7	75	29.6	73	29.7	68	29.5

TABLE 2 (Continued)

SEPTEMBER 1978

Time	Date: 4 Temp	4 BP	11 Temp	11 BP	18 Temp	18 BP	25 Temp	25 BP
0800	59	29.6	67	29.6	73	29.6	67	29.7
1200	70	29.6	71	29.6	80	29.6	68	29.7
1600	71	29.6	78	29.5	83	29.6	57	29.7
2000	68	29.5	69	29.5	73	29.6	50	29.7
2400	59	29.6	64	29.6	67	29.6	47	29.7
0400	50	29.6	63	29.5	63	29.6	51	29.8
0800	55	29.6	69	29.5	66	29.7	75	29.7
1200	70	29.7	77	29.5			70	29.7

OCTOBER 1978

Time	Date: 2 Temp	2 BP	9 Temp	9 BP	16 Temp	16 BP	23 Temp	23 BP
0800	43	29.6	29	29.7	43		45	29.6
1200	58	29.6	52	29.8	44	29.5	58	29.6
1600	62	29.6	58	29.8	41	29.6	54	29.6
2000	50	29.6		29.8	37	29.7	40	29.7
2400	48	29.6	36	29.8	36	29.8	34	29.7
0400	38	29.6	36	29.8	34	29.8	34	29.7
0800	48	29.5	46	29.8	34	29.9	37	29.7
1200	68	29.5	56	29.8	43	29.9	53	29.7

TABLE 2 (Continued)

	NOVEMBER 1978			
Date:	6		20	
Time	Temp	BP	Temp	BP
0800	37	29.5	34	29.8
1200	58	29.5	45	29.8
1600	58	29.5	43	29.8
2000	47	29.5	34	29.8
2400	40	29.5	35	29.8
0400	40	29.5	31	29.8
0800	51	29.5	35	29.9
1200	40	29.5	40	29.8

	DECEMBER 1978			
Date:	4		18	
Time	Temp	BP	Temp	BP
0800	40	29.3	31	29.4
1200	36	29.2	36	29.6
1600	36	29.4	42	29.6
2000	28	29.2	36	29.5
2400	28	29.2	35	29.5
0400	26	29.2	33	29.5
0800	27	29.3	38	29.5
1200	38	29.3	40	29.5

TABLE 2 (Continued)

Time	Date: JANUARY 1979 8 Temp	8 BP	22 Temp	22 BP
0800	20	29.5	26	29.7
1200	31	29.6	28	29.4
1600	21	29.6	30	29.4
2000	8	29.8	26	29.5
2400	2	29.8	24	29.5
0400	5	29.8	27	29.5
0800	7	29.8	29	29.5
1200	28	29.8	43	29.4

Time	Date: FEBRUARY 1979 5 Temp	5 BP	19 Temp	19 BP
0800	6	-	22	29.8
1200	18	29.7	28	29.9
1600	26	29.6	33	29.9
2000	12	29.7	29	29.9
2400	12	29.7	16	29.9
0400	7	29.7	12	29.8
0800	7	29.6	17	29.8
1200	38	29.6	44	29.8

TABLE 2 (Continued)

Time	Date:	MARCH 1979						APRIL 1979	
		5		19		26		2	
		Temp	BP	Temp	BP	Temp	BP	Temp	BP
0800		48	29.6	49	29.6	34	29.4	58	29.7
1200		60	29.5	76	29.6	39	29.5	63	29.8
1600		59	29.5	72	29.6	38	29.5	68	29.3
2000		44	29.6	64	29.6	38	29.6	63	29.4
2400		40	29.6	50	29.5	37	29.6	43	29.6
0400		40	29.6	50	29.5	36	29.6	45	29.6
0800		46	29.5	57	29.6	46	29.7	50	29.6
1200		52	29.5	68	29.6	45	29.8	52	29.6

TABLE 3

WIND DIRECTION (D), SPEED (S) (mph) AND PERCENT CLOUD COVER (% CC)
KYGER CREEK STATION

MARCH 1978

Date:				13			20			27					
	Wind			Wind			Wind			Wind			Wind		
Time	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC
1200				NE	15-20	90	SE	15-20	20	W	10	100			
1600					5-10	100	Calm	0	30	W	10-15	100			
2000				E	30		SE	5-10	80	W	5-10	100			
2400				E	30		S	5	0	W	5-10	100			
0400				SE	5		S	5-10	15	SW	5-10	100			
0800				SE	10-15	100	S	10-15	90	SW	10-15	100			
1200				SE	25-30	70	W	30	100	SW	15-20	0			

APRIL 1978

	3			10			17			24					
	Wind			Wind			Wind			Wind			Wind		
	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC
0800				SW	0-5	20	NE	20	0	SW	5	30			
1200	SW	0-5	100	SE	15-20	50	N	5	0	SW	5	50			
1600	SW	0-5	100	SW	30	40	N	10	60	W	5	40			
2000	W	0-5	70	SW	0-5	100	N	15-20	100	NW	5	100			
2400	W	5	70	SW	5	100	N	15	100	NE	15	100			
0400	SW	5	50	S	5	100	N	5	100	NE	10	100			
0800	S	5	80	S	25	90	N	15	100	NE	15	100			
1200	SW	0-5	100	SW	15	100				NE	30	100			

TABLE 3 (Continued)

MAY 1978

Date:	1			8			15			22			29		
	Wind			Wind			Wind			Wind			Wind		
Time	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC
0800	N	5-10	10	SE	0-5	100	Calm	0	100	E	5-10	5	SW	5	0
1200	NE	5-10	10	SE	5	100	Calm	0	100	E	5	15	SW	1-5	0
1600	NW	10	5	S	0-5	100	N	0-5	100	Calm	0	70	SW	5	30
2000	N	5	10	S	5	100	N	5	90	Calm	0	80	SW	10	100
2400	N	15	0	S	10	40	N	5	60	N	1-5	40	S	1-5	80
0400	N	5	0	S	10	100	N	5	100	E	1-5	100	S	5	80
0800	N	15	0			80	NW	5-10	100	S	5	100	SW	5	20
1200	N	15	0	SW	5-10	50	W	5	100	S	5	100			

JUNE 1978

	5			12			19			26					
	Wind			Wind			Wind			Wind			Wind		
	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC
0800	5	5	35	S	5-10	20	W	5	100	SE	15-20	100			
1200	W	5	80	S	5-10	10	SW	5	95	SE	10	100			
1600	SW	10	35	S	5-10	100	Calm	0	100	SW	15	100			
2000	N	5	30	S	10-15	95	Calm	0	25	S	10	100			
2400	N	5-10	100	W	5	0	SW	10	5	SW	10	100			
0400	N	5-10	50	NW	5	0	Calm	0	0	SW	10	100			
0800	NE	5	5	NW	10	70	Calm	0	85	SW	5	100			
1200	S	5	20	NW	10-15	75	SW	5	50	SW	5	100			

TABLE 3 (Continued)

JULY 1978

Time	Date: 3 Wind D	3 Wind S	3 % CC	10 Wind D	10 Wind S	10 % CC	17 Wind D	17 Wind S	17 % CC	24 Wind D	24 Wind S	24 % CC	31 Wind D	31 Wind S	31 % CC
0800			100	SW	5	70	NW	5	0	NW	5-10	100	SW	20	100
1200	SW	5-10	100	SW	5	80	NW	5	5	NW	5-10	100	SW	15	100
1600	SW	10	50	SW	20	100	NW	5	20	N	5-10	100	SW	10-15	100
2000	NW	10	100	N	15	100	NW	5	5	S	5-10	100	W	5	30
2400	W	5	80	NW	5	80	S	10	0	W	5	100	W	0-5	20
0400	NW	0-5	100	N	5	60	S	5	100	S	10	100	W	5	40
0800	N	5	100	NE	5	5	S	5	10	S	15	100	NW	5	30
1200	N	0-5	100	N	5	20	NW	5	5	S	10	100	S	15	25

AUGUST 1978

Time	7 Wind D	7 Wind S	7 % CC	14 Wind D	14 Wind S	14 % CC	21 Wind D	21 Wind S	21 % CC	28 Wind D	28 Wind S	28 % CC	Wind D	Wind S	% CC
0800	SE	10-15	100			100	NE	5-10	0	S	5-10	100			
1200	S	10-15	100			10	NE	15	20	S	5	60			
1600	S	5	100	S	1-5	40	N	10	10	S	10	10			
2000	SW	10	80	SE	20	100	N	5	0	S	5	50			
2400	W	10	30	E	15	40	NE	5	0	W	5	100			
0400			100	S	5	50	NE	5	30	SW	15	20			
0800		5-10	100	S		50	SE	5-10	10	W	10	100			
1200	W	15	90	S	5	40	NW	5-10	10	S	10	100			

TABLE 3 (Continued)

SEPTEMBER 1978

Time	Date: 4 Wind D	4 Wind S	4 % CC	11 Wind D	11 Wind S	11 % CC	18 Wind D	18 Wind S	18 % CC	25 Wind D	25 Wind S	25 % CC	Wind D	Wind S	% CC
0800	N	10-15	50	S	10	10	SE	5	10	NE	15	10			
1200	NE	10-15	70	W	1-5	60	SW	10	5	N	15	20			
1600	N	5	50	S	5	70	SW	5	70	N	5	5			
2000	N	5	30	Calm	0	0	SW	1-5	10	N	5	0			
2400	NE	5	20	SW	5	0	SW	1-5	0	N	5	0			
0400	E	5	100	SW	5	0	Calm	0	60	NE	10	0			
0800	E	5	100	S	10	75	SW	5	0	NW	5	0			
1200	N	10	0	S	10	50				N	5	5			

OCTOBER 1978

Time	2 Wind D	2 Wind S	2 % CC	9 Wind D	9 Wind S	9 % CC	16 Wind D	16 Wind S	16 % CC	23 Wind D	23 Wind S	23 % CC	Wind D	Wind S	% CC
0800	NE	5-10	0	SW	5-10	0	SE	10	25	SW	5	100			
1200	Calm	0	40	SW	5-10	0	W	5	90	SW	5-10	95			
1600	Calm	0	50	S	5-10	0	W	10	100	NW	5-10	100			
2000	Calm	0	0	S	5	0	NW	5	90	N	5	100			
2400	Calm	0	0	S	5	0	N	15-20	100	N	5	0			
0400	Calm	0	0	S	5	0	N	5	95	N	5-10	100			
0800	NE	5		S	5-10	0	N	5-10	100	NE	5	25			
1200	S	5	10	S	10	0	NE	5	80	Calm	0	0			

TABLE 3 (Continued)

NOVEMBER 1978

Date:	6						20								
	Wind			Wind			Wind			Wind			Wind		
Time	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC
0800	SW	5	0				N	5	0						
1200	SW	5	0				N	5	50						
1600	SW	5	100				N	5	30						
2000	SW	5	0				N	5	20						
2400	N	5	50				N	5	50						
0400	N	5	80				N	5	40						
0800	N	20	100				N	5	100						
1200	NW	10	100				NW	5	100						

DECEMBER 1978

	4						18								
	Wind			Wind			Wind			Wind			Wind		
Time	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC
0800	W	30	100				S	10	100						
1200	SW	30	90				S	10	100						
1600	SW	20	100				S	5	100						
2000	SW	5	100				SW	5	70						
2400	SW	5	20				SW	5	70						
0400	SW	10	0				NW	5	100						
0800	SW	5	0				NE	10	100						
1200	SW	10-15	0				NE	0	100						

TABLE 3 (Continued)

JANUARY 1979

Date:				8						22					
	Wind			Wind			Wind			Wind			Wind		
Time	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC
0800				W	10	100				SW	15	100			
1200				W	15	50				SW	5	100			
1600				SW	5	80				SW	5	80			
2000				SW	5	40				S	5	100			
2400				SW	5	10				SE	5	100			
0400				SW	5	0				E	5	30			
0800				S	10	0				E	10	90			
1200				S	10	5				S	10	20			

FEBRUARY 1979

Date:	5						19								
	Wind			Wind			Wind			Wind			Wind		
Time	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC	D	S	% CC
0800	W	15	25				W	10	100						
1200	W	5	40				SW	10-15	50						
1600	SW	5	10				SW	5	30						
2000	W	5	0				S	0-5	0						
2400	NE	0-5	0				S	5	0						
0400	NE	0-5	20				Calm	0	0						
0800	NE	0-5	90				S	5	10						
1200	SE	0-5	75				S	10	0						

TABLE 3 (Continued)

MARCH 1979

Time	Date: 5 Wind D	5 Wind S	5 % CC	Wind D	Wind S	% CC	19 Wind D	19 Wind S	19 % CC	26 Wind D	26 Wind S	26 % CC	Wind D	Wind S	% CC
0800	W	10	100				Calm	0	0	NW	10	100			
1200	W	15	100				NE	5	90	SW	15-20	100			
1600	W	5	0				NE	5	100	SW	10-15	100			
2000	SW	5	100				NE	5	100	S	10	0			
2400	SW	5	100				N	5	100	SW	5-10	0			
0400	S	10	100				NE	5	100	W	5	100			
0800	S	10	100				NE	5	100	N	5	100			
1200	SW	15	100				N	5	100	NW	5	100			

APRIL 1979

Time	Date: 2 Wind D	2 Wind S	2 % CC	Wind D	Wind S	% CC	Wind S	Wind D	% CC	Wind S	Wind D	% CC	Wind S	Wind D	% CC
0800	SW	10	100												
1200	SW	15	100												
1600	S	10-15	90												
2000	W	5	100												
2400	SW	5	100												
0400	SW	5	100												
0800	N	10	100												
1200	N	5	100												

TABLE 4

CHLORINATION DATA
KYGER CREEK STATION

		Unit #1				Unit #2				Unit #3				Unit #4				Unit #5			
Mon.	Day	I[a] Free	I[b] Total	D[c] Free	D[d] Total	I Free	I Total	D Free	D Total	I Free	I Total	D Free	D Total	I Free	I Total	D Free	D Total	I Free	I Total	D Free	D Total
1978 Mar.	13																	0.02	0.62	0.01	0.60
	20					0.06	0.72	0.03	0.77												
	27									0.04	0.62	0.00	0.05					0.18	0.75	0.12	0.46
Apr.	3	0.04	0.62	0.00	0.00																
	10	0.00	0.51	0.03	0.65					0.16	0.70	0.10	0.56	1.19	0.60	0.14	0.46				
	17									0.04	0.78	0.02	0.78								
	24																				
May	1	0.00	0.68	0.00	0.00	0.06	0.68	0.00	0.19												
	8					0.05	0.63	0.00	0.19	0.03	0.53	0.00	0.19								
	15									0.00	0.97	0.00	0.97	0.04	0.84	0.03	0.84				
	22	0.14	0.49	0.05	0.44									0.20	0.56	0.12	0.41				
	29	0.05	0.49	0.00	0.53																
June	5	0.24	0.61	0.22	0.44	0.29	0.68	0.29	0.56												
	12					0.13	0.29	0.05	0.20					0.05	0.42	0.02	0.34				
	19													0.07	0.31	0.02	0.27	0.05	0.41	0.02	0.36
	26	0.05	0.39	0.00	0.41																
July	3									0.02	0.17	0.00	0.22					0.28	0.51	0.23	0.37
	10					0.30	0.61	0.17	0.32												
	17									0.37	0.56	0.21	0.41					0.08	0.44	0.04	0.25
	31									0.02	0.39	0.00	0.34								
Aug.	7	0.06		0.05	0.22	0.12	0.46	0.02	0.17												
	14									0.10	0.41	0.05	0.37	0.14	0.37	0.06	0.32				
	21									0.18	0.41	0.07	0.32	0.25	0.58	0.18	0.44				
	28									0.08	0.24	0.03	0.17					0.21	0.56	0.18	0.36

TABLE 4 (Continued)

		Unit #1				Unit #2				Unit #3				Unit #4				Unit #5			
Mon.	Day	I[a] Free	I[b] Total	D[c] Free	D[d] Total	I Free	I Total	D Free	D Total	I Free	I Total	D Free	D Total	I Free	I Total	D Free	D Total	I Free	I Total	D Free	D Total
Sep.	4									0.07	0.37	0.02	0.22								
	11	0.13	0.41	0.03	0.27	0.30	0.46	0.40	0.29												
	18					0.07	0.34	0.00	0.39	0.20	0.41	0.12	0.27								
	25	0.15	0.39	0.12	0.27									0.40	0.68	0.27	0.49				
Oct.	2	0.07	0.58	0.10	0.39													0.31	0.63	0.16	0.24
	9									0.14	0.07	0.44	0.24								
	16									0.02	0.68	0.02	0.73	0.03	0.73	0.02	0.73				
	23					0.01	0.73	0.00	0.68	0.03	0.78	0.00	0.34								
Nov.	6	0.00	0.83	0.00	0.80																
	20									0.00	0.87	0.00	0.87	0.00	1.02	0.00	0.95				
Dec.	4	0.00	0.70	0.00	0.56									0.00	0.82	0.00	0.32				
	18	0.03	0.83	0.00	0.63									0.04	0.78	0.00	0.68				
Jan.	8					0.00	0.77	0.00	0.58									0.00	0.05	0.00	0.10
1979	22	0.00	0.88	0.00	0.39									0.03	0.77	0.00	0.87				
Feb.	5					0.00	0.97	0.00	1.02									0.03	1.36	0.05	1.12
	19									0.04	0.78	0.00	0.83	0.03	0.92	0.01	1.02				
Mar.	5													0.04	0.87	0.01	0.83	0.02	0.75	0.00	0.73
	19									0.00	0.80	0.00	0.80	0.00	0.87	0.00	0.92				
	26	0.06	1.07	0.00	0.49					0.04	1.06	0.01	0.96								
Apr.	2									0.00	0.74	0.00	0.78	0.00	0.74	0.00	0.74				

[a] Intake - free available chlorine mg/l

[b] Intake - total residual chlorine mg/l

[c] Discharge - free available chlorine mg/l

[d] Discharge - total residual chlorine mg/l

TABLE 5

RIVER ELEVATION (FT ABOVE MEAN SEA LEVEL) DATA
KYGER CREEK STATION

Time	MARCH 1978			APRIL 1978		
Date:	13	20	27	3	10	17	24
0800					543	539	540
1200	544	545	550	543	543	539	540
1600	544	544	550	543	543	540	540
2000	545	544	551	543	543	539	540
2400	545	543	551	543	543	539	540
0400	548	543	550	543	542	539	540
0800	548	543	550	543	542		540
1200	548	543	550	543	542		540

	MAY 1978					JUNE 1978			
	1	8	15	22	29	5	12	19	26
0800	540	539	542	543	539	538	539	538	538
1200	540	539	542	543	539	538	539	538	538
1600	540	539	542	543	539	538	539	538	538
2000	540	540	542	542	539	538	539	538	538
2400	540	540	542	542	539	538	539	538	538
0400	540	540	542	542	539	538	538	538	538
0800	540	540	543	542	539	538	538	538	538
1200	540		543	541	539	538	538	539	538

	JULY 1978					AUGUST 1978			
	3	10	17	24	31	7	14	21	28
0800	538	546	539	539	539	539	539	538	539
1200	538	546	539	539	539	539	539	538	539
1600	540	546	539	539	540	539	539	538	539
2000	540	546	539	539	540	539	539	538	539
2400	540	546	539	539	540	539	539	538	538
0400	540	546	539	539	540	539	539	538	538
0800	540	547	539	539	540	540	539	538	538
1200	541	547	539	539	540	540	539	538	538

TABLE 5 (Continued)

Time	SEPTEMBER 1978 Date: 4	11	18	25	OCTOBER 1978 2	9	16	23
0800	539	539	539	539	539	539	539	539
1200	539	539	539	539	539	539	539	539
1600	539	539	539	539	539	539	539	539
2000	539	539	539	539	539	539	539	539
2400	539	539	539	539	539	539	539	539
0400	538	539	539	539	539	539	539	539
0800	538	539	539	539	539	539	539	539
1200	538	539	539	539	539	539	539	539

Time	NOVEMBER 1978 Date: 6	20	DECEMBER 1978 4	18
0800	539	539	541	539
1200	539	539	543	539
1600	539	539	544	539
2000	539	539	545	539
2400	539	539	546	539
0400	539	539	546	539
0800	539	539	546	539
1200	539	539	546	539

Time	JANUARY 1979 Date: 8	22	FEBRUARY 1979 5	19
0800	544	440	538	550
1200	545	551	538	551
1600	545	-	538	551
2000	545	-	538	551
2400	543	-	538	550
0400	543	-	538	550
0800	544	-	538	550
1200	545	-	538	550

TABLE 5 (Continued)

Time	Date:	MARCH 1979			APRIL 1979
		5	19	26	3
0800		550	540	542	542
1200		550	540	542	542
1600		551	541	542	542
2000		552	541	542	542
2400		552	541	542	542
0400		553	540	542	542
0800		554	540	542	543
1200		554	539	542	543

TABLE 6

KYGER CREEK STATION UNITS WHICH WERE OUT OF SERVICE
DURING IMPINGEMENT AND ENTRAINMENT SURVEYS

Unit	1					2					3					4					5				
Week in Month	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Month																									
March 1978			-[a]	-	-			-	-	-			-	-	-			X[b]	X	X			-	-	-
April 1978	-	-	-	-		-	-	-	-		-	-	-	-		X	X	-	X		-	-	-	-	-
May 1978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	-
June 1978	-	-	-	-		-	-	-	-		-	X	X	X		-	-	-	-		-	-	-	-	
July 1978	-	-	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-	-	-	+[c]	-	-	-
August 1978	-	-	-	-		-	-	-	-		X	-	-	-		-	-	-	-		-	-	-	-	
September 1978	-	-	-	-		-	-	-	-		-	-	-	X		-	-	-	-		-	-	-	X	
October 1978	-	-	X	X		-	-	-	-		+	-	-	-		-	-	-	-		-	-	X	X	
November 1978		-		-			-		-			-		-			-		-			-		-	
December 1978	-		-			-		-			+		X			-			-		-		-		
January 1979		-		-			-		X			X		X			-		-			-		-	
February 1979	-		-			+		-			X		-			-		-			-		-		
March 1979	-			-	-	X		X	-		-		-	-		-		-	X		-		-	-	
April 1979	X					-					-					-					-				

[a]Unit in operation

[b]Unit out of service for entire testing period

[c]Unit out of service for part of the testing period

APPENDIX C

KYGER CREEK STATION
ENTRAINMENT DATA

Table	Title
1	ICHTHYOPLANKTON ENTRAINMENT DATA KYGER CREEK STATION MARCH 1978
2	ICHTHYOPLANKTON ENTRAINMENT DATA KYGER CREEK STATION APRIL 1978
3	ICHTHYOPLANKTON ENTRAINMENT DATA KYGER CREEK STATION MAY 1978
4	ICHTHYOPLANKTON ENTRAINMENT DATA KYGER CREEK STATION JUNE 1978
5	ICHTHYOPLANKTON ENTRAINMENT DATA KYGER CREEK STATION JULY 1978
6	ICHTHYOPLANKTON ENTRAINMENT DATA KYGER CREEK STATION AUGUST 1978

TABLE 1

ICHTHYOPLANKTON ENTRAINMENT DATA[a]
KYGER CREEK STATION
MARCH 1978

DATE: March 13 & 14	Unit 1	Unit 2	Unit 3	Unit 5
Volume filtered (m^3)	70.6	84.1	75.2	60.5
Egg density (#/100m^3)	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	0.0	0.0	0.0	0.0

DATE: March 20 & 21	Unit 1	Unit 2	Unit 3	Unit 5
Volume filtered (m^3)	159.6	164.9	147.1	146.5
Egg density (#/100m^3)	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	0.0	0.0	0.7	0.0
Walleye				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.7	0.0
% composition	0.0	0.0	100.0	0.0

DATE: March 27 & 28	Unit 1	Unit 2	Unit 3	Unit 5
Volume filtered (m^3)	178.3	188.3	176.3	192.7
Egg density (#/100m^3)	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	0.0	0.0	0.0	0.0

[a]Samples were collected at each unit if at least one circulating water pump (CWP) was operating. Units with no data indicate that the unit was out of service and the CWPs were not running. An out of service unit was sampled if a CWP was running.

[b]Qualitative sample.

TABLE 2

ICHTHYOPLANKTON ENTRAINMENT DATA
KYGER CREEK STATION
APRIL 1978

DATE: April 3 & 4	Unit 1	Unit 2	Unit 3		Unit 5
Volume filtered (m^3)	154.9	155.7	133.5		160.8
Egg density (#/100m^3)	0.0	0.0	0.0		0.0
Larval density (#/100m^3)	0.0	0.0	0.0		0.0
DATE: April 10 & 11	**Unit 1**	**Unit 2**	**Unit 3**		**Unit 5**
Volume filtered (m^3)	129.6	108.6	133.8		112.7
Egg density (#/100m^3)	0.0	0.0	0.0		0.0
Larval density (#/100m^3)	0.0	0.0	0.0		0.0
DATE: April 17 & 18	**Unit 1**	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**
Volume filtered (m^3)	143.2	147.2	127.2	119.6	165.3
Egg density (#/100m^3)	0.0	0.7	0.0	0.0	0.0
Larval density (#/100m^3)	0.0	0.0	0.0	0.0	0.0
DATE: April 24 & 25	**Unit 1**	**Unit 2**	**Unit 3**	**Unit 4**	**Unit 5**
Volume filtered (m^3)	151.3	152.8	137.1	125.3	148.5
Egg density (#/100m^3)	0.0	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	0.0	1.3	1.5	0.0	0.7
Stizostedion					
Number	0	2	2	0	0
Density (#/100m^3)	0.0	1.3	1.5	0.0	0.0
% composition	0.0	100.0	100.0	0.0	0.0
Unidentifiable					
Number	0	0	0	0	1
Density (#/100m^3	0.0	0.0	0.0	0.0	0.7
% composition	0.0	0.0	0.0	0.0	100.0

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TABLE 3

ICHTHYOPLANKTON ENTRAINMENT DATA
KYGER CREEK STATION
MAY 1978

DATE: May 1 & 2	Unit 1	Unit 2	Unit 3	Unit 4
Volume filtered (m^3)	158.2	149.1	113.3	123.9
Egg density ($100m^3$)	0.0	0.0	0.0	0.0
Larval density ($100m^3$)	0.0	2.0	0.0	0.8
Stizostedion				
Number	0	3	0	1
Density ($100m^3$)	0.0	2.0	0.0	0.8
% composition	0.0	100.0	0.0	100.0

DATE: May 8 & 9	Unit 1	Unit 2	Unit 3	Unit 4
Volume filtered (m^3)	139.9	143.0	114.6	120.1
Egg density ($100/m^3$)	0.0	0.0	0.0	0.0
Larval density ($100m^3$)	221.6	279.7	253.0	315.6
Unidentified sucker (Catostomidae)				
Number	233	312	193	277
Density ($100m^3$)	166.5	218.2	168.4	230.6
% composition	75.2	78.0	66.6	73.1
Stizostedion				
Number	30	47	31	88
Density	21.4	32.9	27.0	73.3
% composition	9.7	11.8	10.7	23.2
Unidentifiable larvae				
Number	47	41	66	14
Density ($100m^3$)	33.6	28.7	57.6	11.6
% composition	15.2	10.2	22.7	3.7

TABLE 3 (CONTINUED)

DATE: May 15 & 16	Unit 1	Unit 2	Unit 3	Unit 4
Volume filtered (m^3)	157.2	157.7	144.5	129.6
Egg density ($100m^3$)	0.0	1.3	0.7	0.0
Larval density ($100m^3$)	405.2	346.9	250.5	492.3
Mooneye/goldeye (*Hiodon*)				
Number	1	1	0	0
Density ($100m^3$)	0.6	0.6	0.0	0.0
% composition	0.2	0.2	0.0	0.0
Unidentified cyprinid (Cyprinidae)				
Number	0	0	1	0
Density ($100m^3$)	0.0	0.0	0.7	0.0
% composition	0.0	0.0	0.3	0.0
Unidentified sucker (*Carpiodes*)				
Number	557	334	214	531
Density ($100m^3$)	354.3	211.8	148.1	409.7
% composition	87.4	61.1	59.1	83.2
Unidentified sunfish (*Pomoxis*)				
Number	1	0	0	0
Density ($100m^3$)	0.6	0.0	0.0	0.0
% composition	0.2	0.0	0.0	0.0
Unidentified percid (Percidae)				
Number	0	0	0	1
Density ($100m^3$)	0.0	0.0	0.0	0.8
% composition	0.0	0.0	0.0	0.2
Stizostedion				
Number	18	24	3	35
Density ($100m^3$)	11.5	15.2	2.1	27.0
% composition	2.8	4.4	0.8	5.5

TABLE 3 (CONTINUED)

DATE: May 15 & 16	Unit 1	Unit 2	Unit 3	Unit 4
Unidentifiable				
Number	60	188	144	71
Density ($100m^3$)	38.2	119.2	99.7	54.8
% composition	9.4	34.4	39.8	11.1
DATE: May 22 & 23				
Volume filtered (m^3)	162.6	41.7	147.4	136.9
Egg Density ($100m^3$)	1.2	0.0	0.7	0.0
Larval density ($100m^3$)	22.1	21.6	10.9	64.3
Unidentified sucker (Catostomidae)				
Number	0	2	0	2
Density ($100m^3$)	0.0	4.8	0.0	1.5
% composition	0.0	22.2	0.0	2.3
Unidentified sucker (*Carpiodes*)				
Number	16	5	9	57
Density ($100m^3$)	9.8	12.0	6.1	41.6
% composition	44.4	55.6	56.3	64.8
Stizostedion				
Number	3	1	1	5
Density ($100m^3$)	1.8	2.4	0.7	3.7
% composition	8.3	11.1	6.3	5.7
Unidentified percid (Percidae)				
Number	1	0	0	0
Density ($100m^3$)	0.6	0.0	0.0	0.0
% composition	2.8	0.0	0.0	0.0
Unidentifiable				
Number	16	1	6	24
Density ($100m^3$)	9.8	2.4	4.1	17.5
% composition	44.4	11.1	37.5	27.3

TABLE 3 (CONTINUED)

DATE: May 29 & 30	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Volume filtered (m^3)	137.7	146.2	129.5	118.5	139.6
Egg density ($100m^3$)	0.0	0.7	0.0	1.7	3.6
Larval density ($100m^3$)	54.5	65.0	37.8	176.4	65.2
Unidentified cyprinid (Cyprinidae)					
Number	0	0	0	2	0
Density ($100m^3$)	0.0	0.0	0.0	1.7	0.0
% composition	0.0	0.0	0.0	1.0	0.0
Carp					
Number	2	9	7	9	7
Density ($100m^3$)	1.5	6.2	5.4	7.6	5.0
% composition	2.7	9.5	14.3	4.3	7.7
Unidentified sucker (Catostomidae)					
Number	0	0	3	0	0
Density ($100m^3$)	0.0	0.0	2.3	0.0	0.0
% composition	0.0	0.0	6.1	0.0	0.0
Unidentified sucker (*Carpiodes*)					
Number	65	68	0	146	72
Density ($100m^3$)	47.2	46.5	0.0	123.2	51.6
% composition	86.7	71.6	0.0	69.9	79.1
White sucker					
Number	0	0	36	0	1
Density ($100m^3$)	0.0	0.0	27.8	0.0	0.7
% composition	0.0	0.0	73.5	0.0	1.1
Unidentified sunfish (*Pomoxis*)					
Number	0	0	0	2	1
Density ($100m^3$)	0.0	0.0	0.0	1.7	0.7
% composition	0.0	0.0	0.0	1.0	1.1

TABLE 3 (CONTINUED)

DATE: May 29 & 30	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Unidentified percid (Percidae)					
Number	0	3	0	0	0
Density ($100m^3$)	0.0	2.1	0.0	0.0	0.0
% composition	0.0	3.2	0.0	0.0	0.0
Yellow perch					
Number	0	0	0	1	0
Density ($100m^3$)	0.0	0.0	0.0	0.8	0.0
% composition	0.0	0.0	0.0	0.5	0.0
Stizostedion					
Number	3	2	1	10	5
Density ($100m^3$)	2.2	1.4	0.8	8.4	3.6
% composition	4.0	2.1	2.0	4.8	5.5
Unidentifiable					
Number	5	13	2	39	5
Density ($100m^3$)	3.6	8.9	1.5	32.9	3.6
% composition	6.7	13.7	4.1	18.7	5.5

TABLE 4

ICHTHYOPLANKTON ENTRAINMENT DATA
KYGER CREEK STATION
JUNE 1978

DATE: June 5 & 6	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Volume filtered (m^3)	121.1	145.0	130.4	120.9	132.0
Egg density (#/$100m^3$)	5.8	6.2	4.6	9.1	7.6
Larval density (#/$100m^3$)	301.4	320.7	186.4	828.7	275.0
Herring (Clupeidae)					
Number	0	0	1	2	0
Density (#/$100m^3$)	0.0	0.0	0.8	1.7	0.0
% composition	0.0	0.0	0.4	0.2	0.0
Mooneye/Goldeye (*Hiodon*)					
Number	4	0	0	0	0
Density (#/$100m^3$)	3.3	0.0	0.0	0.0	0.0
% composition	1.1	0.0	0.0	0.0	0.0
Carp					
Number	126	0	151	363	245
Density (#/$100m^3$)	104.0	0.0	115.8	300.2	185.6
% composition	34.9	0.0	62.2	36.2	67.5
Minnow (Cyprinidae)					
Number	11	0	2	73	30
Density (#/$100m^3$)	9.1	0.0	1.5	60.4	22.7
% composition	3.0	0.0	0.2	7.3	8.2
Sucker (*Carpiodes*)					
Number	175	0	38	455	39
Density (#/$100m^3$)	144.5	0.0	29.1	376.3	29.5
% composition	47.9	0.0	15.6	45.4	10.7
White bass					
Number	0	0	0	1	0
Density (#/$100m^3$)	0.0	0.0	0.0	0.8	0.0
% composition	0.0	0.0	0.0	0.1	0.0

TABLE 4 (CONTINUED)

DATE: June 5 & 6	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Temperate bass (Morone)					
Number	1	0	0	0	0
Density (#/100m^3)	0.8	0.0	0.0	0.0	0.0
% composition	0.3	0.0	0.0	0.0	0.0
Crappie (Pomoxis)					
Number	4	0	4	0	0
Density (#/100m^3)	3.3	0.0	3.1	0.0	0.0
% composition	1.1	0.0	1.7	0.0	0.0
Stizostedion					
Number	2	0	0	28	10
Density (#/100m^3)	1.7	0.0	0.0	23.2	7.6
% composition	0.5	0.0	0.0	2.8	2.8
Percid (Percidae)					
Number	0	0	1	1	1
Density (#/100m^3)	0.0	0.0	0.8	0.8	0.8
% composition	0.0	0.0	0.4	0.1	0.4
Freshwater drum					
Number	0	0	0	12	1
Density (#/100m^3)	0.0	0.0	0.0	9.9	0.8
% composition	0.0	0.0	0.0	1.2	0.4
Unidentifiable					
Number	42	465	46	67	37
Density (#/100m^3)	34.7	320.7	35.3	55.4	28.0
% composition	11.5	100.0	18.9	6.7	13.4

TABLE 4 (CONTINUED)

DATE: June 12 & 13	Unit 1	Unit 2	Unit 4	Unit 5
Volume filtered (m^3)	150.9	142.1	113.0	131.9
Egg density (#/100m^3)	1.3	4.9	6.2	4.5
Larvae density (#/100m^3)	252.5	301.1	459.1	342.7
Herring (Clupeidae)				
Number	6	6	5	7
Density (#/100m^3)	4.0	4.2	4.4	5.3
% composition	1.6	1.4	1.0	1.6
Carp				
Number	226	179	290	272
Density (#/100m^3)	149.8	126.0	256.6	206.2
% composition	59.3	42.3	56.6	60.4
Silverchub				
Number	0	0	1	1
Density (#/100m^3)	0.0	0.0	0.9	0.8
% composition	0.0	0.0	0.2	0.2
Minnow (Cyprinidae)				
Number	27	61	57	22
Density (#/100m^3)	17.9	42.9	50.4	16.7
% composition	7.9	14.4	9.8	4.9
Sucker (*Carpiodes*)				
Number	23	28	50	66
Density (#/100m^3)	15.2	19.7	44.2	50.0
% composition	6.2	6.6	9.8	14.6
Sunfish (*Lepomis*)				
Number	0	1	0	0
Density (#/100m^3)	0.0	0.7	0.0	0.0
% composition	0.0	0.2	0.0	0.0

TABLE 4 (CONTINUED)

DATE: June 12 & 13	Unit 1	Unit 2	Unit 4	Unit 5
Crappie (Pomoxis)				
Number	3	2	5	1
Density (#/100m^3)	2.0	1.4	4.4	0.8
% composition	0.8	0.5	1.0	0.2
Sunfish (Centrarchidae)				
Number	1	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	0.0
% composition	0.3	0.0	0.0	0.0
Stizostedion				
Number	0	3	0	0
Density (#/100m^3)	0.0	2.1	0.0	0.0
% composition	0.0	0.7	0.0	0.0
Percid (Percidae)				
Number	2	2	2	2
Density (#/100m^3)	1.3	1.4	1.8	1.5
% composition	0.5	0.5	0.4	0.4
Freshwater drum				
Number	16	7	25	10
Density (#/100m^3)	10.6	4.9	22.1	7.6
% composition	4.2	1.6	4.9	2.2
Unidentifiable				
Number	77	139	84	71
Density (#/100m^3)	51.0	97.8	74.3	53.8
% composition	20.2	32.8	16.4	15.8

TABLE 4 (CONTINUED)

DATE: June 19 & 20	Unit 1	Unit 2	Unit 4	Unit 5
Volume filtered (m^3)	140.4	134.7	110.5	132.3
Egg density (#/100m^3)	3.6	1.5	1.8	3.0
Larval density (#/100m^3)	115.4	161.0	324.8	258.7
Gizzard shad				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.9	0.0
% composition	0.0	0.0	0.3	0.0
Herring (Clupeidae)				
Number	2	5	10	10
Density (#/100m^3)	1.4	3.7	9.0	7.6
% composition	1.2	2.3	2.8	2.9
Carp				
Number	68	84	117	150
Density (#/100m^3)	48.4	62.4	105.9	113.4
% composition	41.9	38.8	32.6	43.8
Emerald shiner				
Number	6	7	5	62
Density (#/100m^3)	4.3	5.2	4.5	46.9
% composition	3.7	3.2	1.4	18.1
Minnow (Cyprinidae)				
Number	17	19	44	57
Density (#/100m^3)	12.1	14.1	39.8	43.1
% composition	10.5	8.8	12.2	16.7
Sucker (*Carpiodes*)				
Number	21	29	37	16
Density (#/100m^3)	15.0	21.5	33.5	12.1
% composition	13.0	13.4	10.3	4.7

TABLE 4 (CONTINUED)

DATE: June 19 & 20	Unit 1	Unit 2	Unit 4	Unit 5
Crappie (Pomoxis)				
Number	0	0	1	1
Density (#/100m^3)	0.0	0.0	0.9	0.8
% composition	0.0	0.0	0.3	0.4
Sunfish (Centrarchidae)				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.9	0.0
% composition	0.0	0.0	0.3	0.0
Stizostedion				
Number	0	1	0	0
Density (#/100m^3)	0.0	0.7	0.0	0.0
% composition	0.0	0.4	0.0	0.0
Percid (Percidae)				
Number	0	0	2	2
Density (#/100m^3)	0.0	0.0	1.8	1.5
% composition	0.0	0.0	0.6	0.6
Freshwater drum				
Number	43	43	69	34
Density (#/100m^3)	30.6	31.9	62.4	25.7
% composition	26.5	19.8	19.2	9.9
Unidentifiable				
Number	5	29	72	10
Density (#/100m^3)	3.6	21.5	65.2	7.6
% composition	3.1	13.4	0.1	2.9

TABLE 4 (CONTINUED)

DATE: June 26 & 27	Unit 1	Unit 2	Unit 4	
Volume filtered (m^3)	138.7	139.4	114.4	
Egg density (#/100m^3)	0.0	0.7	0.0	
Larval density (#/100m^3)	123.3	189.4	307.7	
Unidentified herring (Clupeidae)				
Number	0	4	8	5
Density (#/100m^3)	0.0	2.9	7.0	
% composition	0.0	1.5	2.3	
Unidentified cyprinid (Cyprinidae)				
Number	13	18	73	17
Density (#/100m^3)	9.4	12.9	63.8	
% composition	7.6	6.8	20.7	
Carp				
Number	54	98	128	99
Density	38.9	70.3	111.9	
% composition	31.6	37.1	36.4	
Emerald shiner				
Number	5	5	1	19
Density (#/100m^3)	3.6	3.6	0.9	
% composition	2.9	1.9	0.3	
Unidentified sucker (*Carpiodes*)				
Number	64	80	76	28
Density (#/100m^3)	46.1	57.4	66.4	
% composition	37.4	30.3	21.6	
Redhorse (*Moxostoma*)				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.9	
% composition	0.0	0.0	0.3	
Unidentified Temperate bass (*Morone*)				
Number	1	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	
% composition	0.6	0.0	0.0	

TABLE 4 (Continued)

DATE: June 26 & 27	Unit 1	Unit 2	Unit 4	Unit 5[a]
White bass				
Number	0	0	0	1
Density (#/100m^3)	0.0	0.0	0.0	
% composition	0.0	0.0	0.0	
Unidentified sunfish (Centrarchidae)				
Number	0	0	0	2
Density (#/100m^3)	0.0	0.0	0.0	
% composition	0.0	0.0	0.0	
Unidentified sunfish (*Lepomis*)				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.9	
% composition	0.0	0.0	0.3	
Unidentified percid				
Number	0	0	0	2
Density (#/100m^3)	0.0	0.0	0.0	
% composition	0.0	0.0	0.0	
Unidentified darter (*Etheostoma*)				
Number	0	1	0	0
Density (#/100m^3)	0.0	0.7	0.0	
% composition	0.0	0.4	0.0	
Stizostedion				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.9	
% composition	0.0	0.0	0.3	

TABLE 4 (CONTINUED)

DATE: June 26 & 27	Unit 1	Unit 2	Unit 4	Unit 5[b]
Freshwater drum				
Number	11	13	21	4
Density (#/100m^3)	7.9	9.3	18.4	
% composition	6.4	4.9	6.0	
Unidentifiable				
Number	23	45	42	18
Density	16.6	32.3	36.7	
% composition	13.5	17.0	11.9	

TABLE 5

ICHTHYOPLANKTON ENTRAINMENT DATA
KYGER CREEK STATION
JULY 1978

DATE: July 3 & 4	Unit 1	Unit 2	Unit 4	Unit 5
Volume filtered (m^3)	146.1	141.8	117.7	137.5
Egg density (#/100m^3)	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	140.3	117.1	249.8	136.0
Unidentified herring (*Alosa*)				
Number	5	1	6	2
Density (#/100m^3)	3.4	0.7	5.1	1.5
% composition	2.4	0.6	2.0	1.1
Gizzard shad				
Number	0	4	1	1
Density (#/100m^3)	0.0	2.8	0.8	0.7
% composition	0.0	2.4	0.3	0.5
Unidentified cyprinid (Cyprinidae)				
Number	90	86	141	43
Density (#/100m^3)	61.6	60.6	119.8	31.3
% composition	43.9	51.8	48.0	23.0
Carp				
Number	1	5	6	3
Density (#/100m^3)	0.7	3.5	5.1	2.2
% composition	0.5	3.0	2.0	1.6
Silver chub				
Number	1	1	0	4
Density (#/100m^3)	0.7	0.7	0.0	2.9
% composition	0.5	0.6	0.0	2.1

TABLE 5 (Continued)

DATE: July 3 & 4	Unit 1	Unit 2	Unit 4	Unit 5
Unidentified minnow (*Notropis*)				
Number	0	0	5	0
Density (#/100m^3)	0.0	0.0	4.2	0.0
% composition	0.0	0.0	1.7	0.0
Emerald shiner				
Number	13	5	9	103
Density (#/100m^3)	8.9	3.5	7.6	74.9
% composition	6.3	3.0	3.1	55.1
Unidentified sucker (*Carpiodes*)				
Number	11	7	20	0
Density (#/100m^3)	7.5	4.9	17.0	0.0
% composition	5.4	4.2	6.8	0.0
Unidentified catfish (Ictaluridae)				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.8	0.0
% composition	0.0	0.0	0.3	0.0
Unidentified catfish (*Ictalurus*)				
Number	1	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	0.0
% composition	0.5	0.0	0.0	0.0
Channel catfish				
Number	0	0	0	2
Density (#/100m^3)	0.0	0.0	0.0	1.5
% composition	0.0	0.0	0.0	1.1
Unidentified sunfish (*Pomoxis*)				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.8	0.0
% composition	0.0	0.0	0.3	0.0

TABLE 5 (Continued)

DATE: July 3 & 4	Unit 1	Unit 2	Unit 4	Unit 5
Unidentified percid (Percidae)				
Number	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.8	0.0
% composition	0.0	0.0	0.3	0.0
Yellow perch				
Number	0	1	0	0
Density (#/100m^3)	0.0	0.7	0.0	0.0
% composition	0.0	0.6	0.0	0.0
Freshwater drum				
Number	37	23	58	12
Density (#/100m^3)	25.3	16.2	49.3	8.7
% composition	18.0	13.9	19.7	6.4
Unidentifiable				
Number	46	33	45	17
Density (#/100m^3)	31.5	23.3	38.2	12.4
% composition	22.4	19.9	15.3	9.1

DATE: July 10 & 11	Unit 1	Unit 2	Unit 4	Unit 5
Volume filtered (m^3)	140.2	137.8	112.8	71.6
Egg density (#/100m^3)	0.7	0.0	0.0	5.6
Larval density (#/100m^3)	12.8	22.5	56.7	41.9
Unidentified herring (Clupiedae)				
Number	0	0	2	0
Density (#/100m^3)	0.0	0.0	1.8	0.0
% composition	0.0	0.0	3.1	0.0

TABLE 5 (CONTINUED)

DATE: July 10 & 11	Unit 1	Unit 2	Unit 4	Unit 5
Unidentified cyprinid (Cyprinidae)				
Number	6	15	27	14
Density (#/100m^3)	4.3	10.9	23.9	19.6
% composition	33.3	48.4	42.2	46.7
Silver chub				
Number	0	0	0	1
Density (#/100m^3)	0.0	0.0	0.0	1.4
% composition	0.0	0.0	0.0	3.3
Emerald shiner				
Number	1	1	0	10
Density (#/100m^3)	0.7	0.7	0.0	14.0
% composition	5.6	3.2	0.0	33.3
Unidentified sucker (Catostomidae)				
Number	0	0	3	1
Density (#/100m^3)	0.0	0.0	2.7	1.4
% composition	0.0	0.0	4.7	3.3
White sucker				
Number	1	2	4	2
Density (#/100m^3)	0.7	1.5	3.5	2.8
% composition	5.6	6.5	6.3	6.7
Unidentified catfish (Ictaluridae)				
Number	1	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	0.0
% composition	5.6	0.0	0.0	0.0
Freshwater drum				
Number	0	2	5	0
Density (#/100m^3)	0.0	1.5	4.4	0.0
% composition	0.0	6.5	7.8	0.0

TABLE 5 (Continued)

DATE: July 10 & 11	Unit 1	Unit 2	Unit 4	Unit 5
Unidentifiable				
Number	9	11	23	2
Density (#/100m^3)	6.4	8.0	20.4	2.8
% composition	50.0	35.5	35.9	6.7

DATE: July 17 & 18	Unit 1	Unit 2	Unit 4	Unit 5
Volume filtered (m^3)	147.9	142.3	113.4	129.3
Egg density (#/100m^3)	0.0	0.0	0.9	0.8
Larval density (#/100m^3)	31.8	69.6	132.3	68.8
Unidentified cyprinid (Cyprinidae)				
Number	8	46	43	41
Density (#/100m^3)	5.4	32.3	37.9	31.7
% composition	17.0	46.5	28.7	46.1
Emerald shiner				
Number	1	0	5	7
Density (#/100m^3)	0.7	0.0	4.4	5.4
% composition	2.1	0.0	3.3	7.9
Unidentified sucker (Catostomidae)				
Number	1	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	0.0
% composition	2.1	0.0	0.0	0.0
White sucker				
Number	1	0	3	1
Density (#/100m^3)	0.7	0.0	2.6	0.8
% composition	2.1	0.0	2.0	1.1

TABLE 5 (Continued)

Date: July 17 & 18	Unit 1	Unit 2	Unit 4	Unit 5
Channel catfish				
Number	1	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	0.0
% composition	2.1	0.0	0.0	0.0
Unidentified sunfish (*Lepomis*)				
Number	0	0	2	0
Density (#/100m^3)	0.0	0.0	1.8	0.0
% composition	0.0	0.0	1.3	0.0
Freshwater drum				
Number	21	25	50	19
Density (#/100m^3)	14.2	17.6	44.1	14.7
% composition	44.7	25.3	33.3	21.3
Unidentifiable				
Number	14	28	47	21
Density (#/100m^3)	9.5	19.7	41.4	16.2
% composition	29.8	28.3	31.3	23.6

DATE: July 24 & 25	Unit 1	Unit 2	Unit 4	Unit 5
Volume filtered (m^3)	143.4	141.9	111.0	127.9
Egg density (#/100m^3)	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	26.5	14.8	71.2	19.5
Unidentified herring (*Alosa*)				
Number	1	0	1	0
Density (#/100m^3)	0.7	0.0	0.9	0.0
% composition	2.6	0.0	1.3	0.0

TABLE 5 (Continued)

DATE: July 24 & 25	Unit 1	Unit 2	Unit 4	Unit 5
Unidentified cyprinid				
Number	0	2	3	2
Density (#/100m^3)	0.0	1.4	2.7	1.6
% composition	0.0	9.5	3.8	8.0
Emerald shiner				
Number	0	0	1	1
Density (#/100m^3)	0.0	0.0	0.9	0.8
% composition	0.0	0.0	1.3	4.0
Unidentified sucker (Catostomidae)				
Number	0	0	0	1
Density (#/100m^3)	0.0	0.0	0.0	0.8
% composition	0.0	0.0	0.0	4.0
White sucker				
Number	1	1	8	0
Density	0.7	0.7	7.2	0.0
% composition	2.6	4.8	10.1	0.0
Freshwater drum				
Number	33	16	60	14
Density (#/100m^3)	23.0	11.3	54.1	10.9
% composition	86.8	76.2	75.9	56.0
Unidentifiable				
Number	3	2	6	7
Density (#/100m^3)	2.1	1.4	5.4	5.5
% composition	7.9	9.5	7.6	28.0

TABLE 5 (Continued)

DATE: July 31 & August 1	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Volume filtered (m^3)	146.9	136.2	139.0	114.9	141.6
Egg density (#/100m^3)	0.0	0.0	2.2	0.0	1.4
Larval density (#/100m^3)	10.9	13.2	6.5	17.4	9.9
Unidentified herring (*Alosa*)					
Number	0	0	0	1	1
Density (#/100m^3)	0.0	0.0	0.0	0.9	0.7
% composition	0.0	0.0	0.0	5.0	7.1
Unidentified cyprinid (Cyprinidae)					
Number	1	0	1	3	0
Density (#/100m^3)	0.7	0.0	0.7	2.6	0.0
% composition	6.3	0.0	11.1	15.0	0.0
Carp					
Number	0	0	2	1	0
Density (#/100m^3)	0.0	0.0	1.4	0.9	0.0
% composition	0.0	0.0	22.2	5.0	0.0
Emerald shiner					
Number	6	1	0	1	6
Density (#/100m^3)	4.1	0.7	0.0	0.9	4.2
% composition	37.5	5.3	0.0	5.0	42.9
Unidentified sucker (Catostomidae)					
Number	0	0	1	0	0
Density (#/100m^3)	0.0	0.0	0.7	0.0	0.0
% composition	0.0	0.0	11.1	0.0	0.0
White sucker					
Number	0	10	3	2	1
Density (#/100m^3)	0.0	7.3	2.2	1.7	0.7
% composition	0.0	52.6	33.3	10.0	7.1

TABLE 5 (Continued)

DATE: July 31 & August 1	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Unidentified sunfish (Centrarchidae)					
Number	0	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.0	0.9	0.0
% composition	0.0	0.0	0.0	5.0	0.0
Unidentified sunfish (*Pomoxis*)					
Number	0	0	0	3	0
Density (#/100m^3)	0.0	0.0	0.0	2.6	0.0
% composition	0.0	0.0	0.0	15.0	0.0
Freshwater drum					
Number	9	7	1	8	5
Density (#/100m^3)	6.1	5.1	0.7	7.0	3.5
% composition	56.3	36.8	11.1	40.0	35.7
Unidentifiable					
Number	0	0	1	0	1
Density (#/100m^3)	0.0	0.0	0.7	0.0	0.7
% composition	0.0	0.0	11.1	0.0	7.1

TABLE 6

ICHTHYOPLANKTON ENTRAINMENT DATA
KYGER CREEK STATION
AUGUST 1978

DATE: August 7 & 8	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Volume filtered (m^3)	148.8	142.2	160.5	109.7	142.4
Egg density (#/100m^3)	0.7	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	53.1	40.1	16.2	27.3	23.9
Unidentified herring (Clupeidae)					
Number	0	0	4	0	1
Density (#/100m^3)	0.0	0.0	2.5	0.0	0.7
% composition	0.0	0.0	15.4	0.0	2.9
Unidentified cyprinid (Cyprinidae)					
Number	1	0	0	0	4
Density (#/100m^3)	0.7	0.0	0.0	0.0	2.8
% composition	1.3	0.0	0.0	0.0	11.8
Silver chub					
Number	1	0	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	0.0	0.0
% composition	1.3	0.0	0.0	0.0	0.0
Emerald shiner					
Number	1	0	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	0.0	0.0
% composition	1.3	0.0	0.0	0.0	0.0
Channel catfish					
Number	0	1	0	0	0
Density (#/100m^3)	0.0	0.7	0.0	0.0	0.0
% composition	0.0	1.8	0.0	0.0	0.0

TABLE 6 (Continued)

DATE: August 7 & 8	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Freshwater drum					
Number	75	56	21	30	29
Density (#/100m^3)	50.4	39.4	13.1	27.3	20.4
% composition	94.9	98.2	80.8	100.0	85.3
Unidentifiable					
Number	1	0	1	0	0
Density (#/100m^3)	0.7	0.0	0.6	0.0	0.0
% composition	1.3	0.0	3.8	0.0	0.0

DATE: August 14 & 15	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Volume filtered (m^3)	134.0	131.0	125.7	99.6	124.6
Egg density (#/100m^3)	0.0	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	4.5	4.6	1.6	8.0	11.2
Unidentified cyprinid (Cyprinidae)					
Number	1	0	1	0	2
Density (#/100m^3)	0.7	0.0	0.8	0.0	1.6
% composition	16.7	0.0	50.0	0.0	14.3
Emerald shiner					
Number	1	0	0	1	9
Density (#/100m^3)	0.7	0.0	0.0	1.0	7.2
% composition	16.7	0.0	0.0	12.5	64.3

TABLE 6 (Continued)

DATE: August 14 & 15	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Quillback					
Number	0	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.0	1.0	0.0
% composition	0.0	0.0	0.0	12.5	0.0
Channel catfish					
Number	2	0	0	1	0
Density (#/100m^3)	1.5	0.0	0.0	1.0	0.0
% composition	33.3	0.0	0.0	12.5	0.0
Unidentified sunfish (*Pomoxis*)					
Number	0	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.0	1.0	0.0
% composition	0.0	0.0	0.0	12.5	0.0
Freshwater drum					
Number	2	6	1	3	3
Density (#/100m^3)	1.5	4.6	0.8	3.0	2.4
% composition	33.3	100.0	50.0	37.5	21.4
Unidentifiable					
Number	0	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.0	1.0	0.0
% composition	0.0	0.0	0.0	12.5	0.0

DATE: August 21 & 22	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Volume filtered (m^3)	143.3	140.9	131.5	109.3	128.6
Egg density (#/100m^3)	0.0	0.7	0.8	0.0	0.0
Larval density (#/100m^3)	1.4	0.7	10.6	11.0	6.2

TABLE 6 (Continued)

DATE: August 21 & 22	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Emerald shiner					
Number	0	0	0	1	0
Density (#/100m^3)	0.0	0.0	0.0	0.9	0.0
% composition	0.0	0.0	0.0	8.3	0.0
Channel catfish					
Number	1	0	0	0	0
Density (#/100m^3)	0.7	0.0	0.0	0.0	0.0
% composition	50.0	0.0	0.0	0.0	0.0
Unidentified sunfish (Centrarchidae)					
Number	0	0	10	7	0
Density (#/100m^3	0.0	0.0	7.6	6.4	0.0
% composition	0.0	0.0	71.4	58.3	0.0
Freshwater drum					
Number	1	1	3	3	2
Density (#/100m^3)	0.7	0.7	2.3	2.7	1.6
% composition	50.0	100.0	21.4	25.0	25.0
Unidentifiable					
Number	0	0	1	1	6
Density (#/100m^3)	0.0	0.0	0.8	0.9	4.7
% composition	0.0	0.0	7.1	8.3	75.0

DATE: August 28 & 29	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5
Volume filtered (m^3)	149.2	140.4	133.0	104.1	129.3
Egg density (#/100m^3)	0.0	0.0	0.0	0.0	0.0
Larval density (#/100m^3)	2.0	2.1	1.5	1.0	0.0

TABLE 6 (Continued)

DATE: August 28 & 29	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Totals
Carp						
Number	0	0	0	1	0	
Density (#/100m^3)	0.0	0.0	0.0	1.0	0.0	
% composition	0.0	0.0	0.0	100.0	0.0	
Unidentified sunfish (*Lepomis*)						
Number	1	0	0	0	0	
Density (#/100m^3)	0.7	0.0	0.0	0.0	0.0	
% composition	33.3	0.0	0.0	0.0	0.0	
Freshwater drum						
Number	2	3	1	0	0	
Density (#/100m^3)	1.3	2.1	0.8	0.0	0.0	
% composition	66.7	100.0	50.0	0.0	0.0	
Unidentifiable						
Number	0	0	1	0	0	
Density (#/100m^3)	0.0	0.0	0.8	0.0	0.0	
% composition	0.0	0.0	50.0	0.0	0.0	

APPENDIX D

KYGER CREEK STATION INTAKE WATER VELOCITY STUDIES

INTRODUCTION

In conjunction with the Kyger Creek Station impingement and entrainment studies, intake water velocity (speed only) measurements were to have been made in front of the traveling screens once per month. During the first six months of the study, minor problems continually occurred which hindered collection of accurate and complete velocity data. Debris within the intake bays, poor operating condition of trash rakes and associated equipment and availability and scheduling of screen operators were some of the problems. Because these problems were expected to continue, discussions were held with appropriate AEP project personnel in an attempt to resolve them. As a result of these discussions, it was decided to discontinue taking velocity measurements inside the intake structure and to perform a one time study in the river out in front of the intake structure. The one time study would be performed to collect data on current speed and direction, bathymetry and, in general terms, describe the bottom sediment composition. In addition, velocity readings would be made inside each intake, if conditions permitted. The Kyger Creek river velocity study was performed on July 12, 1979.

METHODS

River Current Speed and Direction

Current speed and direction measurements were made with a Hydro-Products Model 451 Current Speed Readout Module and Model 460 Underwater Sensor (Figure 1). This is a precision balanced high impact polystyrene Savonious rotor system. The rotor rotates at a rate of 83.5 revolutions per knot with an accuracy of $\pm 3\%$.

The sensor, within its protective cage, was adapted so that the unit could slide up and down a cable used to maintain vertical positioning in the water column. A 170 lb weight was attached to the cable and lowered to the bottom to maintain a vertical position.

Direction measurements were made with a Hydro-Products Model 465A Direction Sensor. This sensor, within its protective cage, was attached to the speed sensor as shown in Figure 1. Current direction was measured in degrees relative to magnetic north.

Three transects were established in the river out in front of the Kyger Creek Station intake. One transect was established along the face of the intake structure and the others

20 and 40 m away from and parallel to the intake structure. Velocity (ft/sec) and direction (degrees) readings were taken along each transect at the surface and 1 m intervals to the bottom.

Bathemetry

Depth measurements were taken using a sounding line (measuring tape attached to a weight) or a Heath-Kit Fish Spotter and Depth Finder Model MI-29. Measurements were taken along the three transects established for measuring current speed and direction and at other selected points to adequately describe the bottom contour.

Sediments

Bottom sediment samples were collected at selected locations using a Ponar grab sampler. In the field, substrate types were noted e.g., gravel, sand, clay, etc. Each sample was then placed in a container and returned to the laboratory for further analysis.

In the laboratory, particle size estimates were made using a modified sieve procedure. Water was added to the sediment samples and vigorously agitated. A 500 ml aliquot was taken and processed through a series of U.S.A. Standard Testing

Sieves. A visual estimate of the substrate retained in each sieve was then made and the results reported as percent composition.

In-Plant Current Speed

Velocity measurements within the intake structure were made concurrent with the river measurements. A Marsh McBirney Model 201 Flow Meter was used. This is a electromagnetic meter with an accuracy of ±2%. The sensor was lowered into an intake bay using a manual support device which slides down the trash Rake Guides or it was attached to the plant trash rakes which were lowered through the water column.

The manual support was lowered through the water column with the velocity sensor fixed in a particular position, for example, facing the river, to measure the currents coming into the plant or facing the traveling screens, to determine if there were currents away from the screens. The sensor could be positioned across the manual support so that readings could be obtained at any position across the width of the bay (traveling screen).

The plant trash rakes were also used as a place of attachment for the velocity sensor. Use of trash rakes required the assistance of plant personnel. During the initial stages of the impingement/entrainment studies, the sensor was allowed to move freely while seeking the true current direction. The disadvantage to this procedure was that current direction was not known. Later, the sensor was fixed facing the river or the traveling screens to measure the magnitude of that component.

RESULTS

River Current Speed and Direction

The results of the current speed and direction survey are graphically shown in Figures 2 through 7 and are also tabulated in Table 1. If no velocity readings are shown in the figures and table, it can be assumed that bottom was reached.

Bathemetry

The bottom contour out in front of the Kyger Creek Station intake is shown in Figure 8.

Sediments

The results of field observations and laboratory analyses of the grab samples taken at the Kyger Creek Station are presented in Table 2 and shown in Figure 9.

In-Plant Current Speed

All in-plant data collected during the impingement/entrainment surveys and during the one time current speed and direction survey are presented in Table 3.

TABLE 1

VELOCITY (ft/sec) AND DIRECTION (DEGREES) READINGS TAKEN ALONG THE FACE OF THE KYGER CREEK INTAKE STRUCTURE AND ALONG TRANSECTS ESTABLISHED AT 20 AND 40 METERS OUT FROM THE FACE. READINGS WERE TAKEN AT POINTS CORRESPONDING TO THE MIDDLE BAY OF EACH UNIT AND AT ONE METER INTERVALS TO THE BOTTOM

	Face of Intake Structure									
Unit:	1		2		3		4		5	
Depth	ft/sec	degrees	ft/sec	degrees	ft/sec	degrees	ft/sec	degrees	ft/sec	degrees
Surface	0.27	320	0.60	325	0.69	320	1.23	360	0.63	270
1 meter	0.40	320	0.59	325	0.76	310	1.21	360	0.49	255
2 meter	0.48	312	0.62	315	0.84	300	1.11	348	0.34	238
3 meter	0.68	310	0.68	318	0.84	300	1.17	312	0.68	258
4 meter	0.74	305	0.52	338	0.71	318	1.54	328	0.78	240
5 meter					0.86	322	1.60	325		
	20 Meter Transect									
Surface	0.74	310	1.28	300	1.60	280	1.69	270		
1 meter	0.96	290	1.15	300	1.55	280				
2 meter	1.12	285	1.02	305						
3 meter	1.11	285								
4 meter	1.00	280								
	40 Meter Transect									
Surface	1.54	315	1.37	290	1.45	280	1.66	275		
1 meter	1.45	305	1.40	285	1.40	275	1.69	270		
2 meter	1.49	300								
3 meter	1.27	300								
4 meter	0.93	300								

TABLE 2

DESCRIPTION OF BOTTOM SEDIMENTS IN FRONT OF THE KYGER CREEK STATION INTAKE STRUCTURE. SAMPLES COLLECTED ON JULY 12, 1979

Station	Estimated Percent Composition U.S.A. Standard Sieve Mesh Size # 5	10	18	35	60	120	230	Sediment Color	Wentworth Grade Classification
A5	No Sample (bottom debris)								
A8	95	1	1	1	1	1	<1	Brown	Pebble
A14	<1	<1	5	5	40	40	10	Brown	Medium and Fine Sand
B8 (a)	<1	<1	5	10	20	35	30	Red Brown	Fine to Very Fine Sand
C8 (b)	20	10	10	10	10	20	20	Brown	Pebble and Fine to Very Fine Sand

(a) oil present
(b) organic material (leaves) present

TABLE 3

VELOCITY (fps) READINGS TAKEN AT THE KYGER CREEK STATION INTAKE
DURING 1978 AND 1979

April 27, 1978 Ohio River El 542 MSL

1MCV[a]			1NCV			2SCV			2MCV			2NCV		
Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	0.5	0.4-0.5	0.3	0.4	0.3-0.5	0.3	0.4	0.3-0.5	0.3	0.4	0.3-0.5	0.3	0.1	0 -0.2
2.7	0.7	0.6-0.8	2.7	0.6	0.5-0.7	2.7	0.3	0.2-0.4	2.7	0.3	0.2-0.5	2.7	0.3	0.2-0.4
5.2	0.4	0.3-0.4	5.2	1.8	1.5-2.0	5.2	0.7	0.6-0.8	4.6	1.0	0.9-1.1	5.2	1.8	1.7-1.9

3SCV			3MCV			3NCV			4SCV			4MCV		
Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	0.4	0.3-0.5	0.3	0.4	0.4-0.4	0.3	0.2	0.2-0.2	0.3	0.4	0.4-0.4	0.3	0.3	0.3-0.3
2.7	0.4	0.3-0.4	2.7	2.6	2.6-2.6	2.7	0.5	0.5-0.5	1.5	0.7	0.7-0.7	2.7	1.4	1.4-1.4
4.6	1.4	1.0-1.5	4.7	1.1	1.1-1.1							5.5	0.1	0.1-0.1
5.2	0.4	0.4-0.5												

4NCV			5SCV			5MCV		
Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	0.3	0.3-0.3	0.3	0.7	0.3-1.0	0.3	0.4	0.3-0.5
2.7	1.5	1.0-1.6	2.4	0.7	0.5-0.9	2.7	1.2	1.1-1.4
4.9	0.4	0.4-0.4				3.8	1.3	1.2-1.4
5.0	0	0 0						

(a) 1MCV - First number designates unit
First letter designates unit bay S (south) M (middle) N (north)
Second letter designates location within bay where readings were taken S (south) C (center) N (north)
Third letter designates direction sensor was facing to make readings R (river) P (plant) V (velocity at true current direction)

(b) BZ - Below zero reading on scale.

TABLE 3 (Continued)

May 24, 1978 Ohio River El 540 MSL

2MCR Depth m	2MCR Velocity x̄	2MCR Velocity Range	3SCR Depth m	3SCR Velocity x̄	3SCR Velocity Range	3MCR Depth m	3MCR Velocity x̄	3MCR Velocity Range	3NCR Depth m	3NCR Velocity x̄	3NCR Velocity Range	4MCR Depth m	4MCR Velocity x̄	4MCR Velocity Range
0.3	0.3	0.2-0.4	0.3	0	BZ[b] -0	0.3	0.1	BZ -0.2	0.3	0.2	0.1-0.2	0.3	0.3	0.1-0.3
1.2	0.2	0.1-0.4	1.2	0	BZ -0	1.2	0	BZ -0.1	1.2	1.2	1.0-1.5	1.2	0.2	0.1-0.2
2.1	0.3	0.2-0.4	2.1	0.2	0.1-0.3	2.1	1.4	1.3-1.5	2.1	0.2	0.2-0.3	2.1	2.0	1.9-2.0
3.0	0.9	0.6-1.0	3.0	2.0	1.5-2.4	3.0	3.0	2.9-3.1	3.0	0.1	0.1-0.2	3.0	1.5	1.4-1.6
4.0	1.0	1.0-1.1	4.0	1.4	1.3-1.5	3.7	1.3	1.3-1.4				4.0	0.3	BZ -0.4
4.9	0.9	0.9-1.0	4.9	0.1	0.1-0.2							4.9	0	BZ -0.1
5.5	1.0	0.8-1.1										5.2	0.5	0.5-0.6

*Readings Taken Outside of Intake Structure Along Skimmer Wall

2MCR Depth m	2MCR Velocity x̄	2MCR Velocity Range	3SCR Depth m	3SCR Velocity x̄	3SCR Velocity Range	3MCR Depth m	3MCR Velocity x̄	3MCR Velocity Range	3NCR Depth m	3NCR Velocity x̄	3NCR Velocity Range	4MCR Depth m	4MCR Velocity x̄	4MCR Velocity Range
2.1	0	0 - 0	2.1	0	0 - 0	2.1	0.5	0.4-0.5	2.1	0	0 - 0	2.1	-	-
2.4	0.2	0.1-0.3	2.4	0.4	0.3-0.4	2.4	0.4	0.4-0.4	2.4	0.2	0.2-0.3	2.4	-	-
2.7	0.6	0.5-0.7	2.7	0.5	0.3-0.7	2.7	0.5	0.5-0.6	2.7	0.3	0.2-0.4	2.7	0	0 - 0
3.0	0.5	0.3-0.7	3.0	0.5	0.4-0.5	3.0	0.7	0.7-0.8	3.0	0.4	0.3-0.4	3.0	0.5	0.4-0.7
3.4	0.5	0.3-0.7	3.4	0.8	0.6-0.9	3.4	1.0	0.8-1.0	3.4	0.5	0.5-0.6	3.4	0.6	0.5-0.7
3.7	0.6	0.5-0.9	3.7	0.6	0.5-0.7	3.7	1.0	0.9-1.0	3.7	0.6	0.5-0.7	3.7	0.7	0.4-0.8
4.0	1.2	1.1-1.3	4.0	0.7	0.7-0.8	4.0	1.3	1.2-1.4	4.0	0.9	0.4-1.1	4.0	0.9	0.7-1.0
4.3	1.0	0.9-1.0	4.3	1.1	1.0-1.1	4.3	1.3	1.3-1.3	4.3	1.0	1.0-1.1	4.3	1.2	1.0-1.3
4.6	1.4	1.4-1.4	4.6	0.9	0.8-0.9	4.6	2.0	1.9-2.0	4.6	1.8	1.6-2.4	4.6	2.6	2.6-2.6
4.9	1.5	1.4-1.5	4.9	0.9	0.8-1.0	4.9	2.1	2.0-2.1	4.9	2.4	2.4-2.5	4.9	2.5	2.4-2.6
5.2	1.5	1.5-1.6	5.2	0.8	0.6-0.8	5.2	2.0	1.9-2.0	5.2	1.5	1.3-2.2	5.2	2.5	2.3-2.5
5.5	1.4	1.4-1.5	5.5	0.6	0.6-0.7	5.5	2.0	1.9-2.0	5.5	1.0	0.5-1.2	5.5	2.4	2.2-2.4
5.8	1.5	1.5-1.6	5.8	0.7	0.7-0.8	5.8	1.8	1.7-1.8	5.8	2.7	2.6-2.7	5.8	2.3	1.1-2.4
6.1	0.9	0.7-1.1	6.1	0.6	0.4-0.7	6.1	1.7	1.7-1.7	6.1	3.0	2.9-3.0	6.1	2.8	2.7-2.8
6.4	0.4	0.3-0.4	6.4	0	0 - 0	6.4	0.5	0.3-0.7	6.4	0.1	0 -0.1	6.4	1.5	0.7-1.5

TABLE 3 (Continued)

June 28, 1978 Ohio River El 538 MSL

1MCR			2MCR			2MCP			4MCR			4MCP			5BCR		
Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	0.2	0.1-0.4	0.3	0.2	0.1-0.3	0.3	0	BZ -0.1	0.3	0.2	0.1-0.4	0.3	BZ	-	0.3	BZ	-
1.2	0.2	BZ -0.4	1.2	0.2	0.1-0.3	1.2	BZ	-	1.2	0.2	0.1-0.3	1.2	BZ	-	1.2	BZ	-
2.1	0.8	0.6-0.9	2.1	0.4	0.3-0.5	2.1	BZ	-	2.1	0.2	0 -0.2	2.1	BZ	-	2.1	0.7	0.4-1.1
3.0	1.0	0.8-1.2	3.0	1.0	0.9-1.1	3.0	BZ	-	3.0	0.6	0.4-0.6	3.0	BZ	-	2.7	0.8	0.7-1.0
4.0	1.1	1.0-1.2	4.0	1.3	1.2-1.4	4.0	BZ	-	4.0	0.3	0.3-0.4	4.0	BZ	-			
4.9	0.6	0.5-0.8	4.9	1.1	1.0-1.2	4.9	BZ	-	4.9	1.1	1.0-1.2	4.9	BZ	-			
5.8	0.1	0 -0.1	5.5	0.6	0.5-0.6	5.5	BZ	-									

July 25, 1978 Ohio River El 539 MSL

2SSP			2SSP			2SCR			2SCP			2SNR			2SNP		
Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	BZ	-	0.3	BZ	-	0.3	0.3	0.2-0.4	0.3	0	0 -0.1	0.3	0.4	0.3-0.4	0.3	BZ	-
1.2	0.1	0 -0.2	1.2	BZ	-	1.2	0.2	0.2-0.3	1.2	BZ	-	1.2	0.6	0.5-0.7	1.2	BZ	-
2.1	0.7	0.6-0.7	2.1	BZ	-	2.1	0.9	0.8-0.9	2.1	BZ	-	2.1	0.5	0.5-0.6	2.1	BZ	-
3.0	0.9	0.8-1.0	3.0	BZ	-	3.0	1.4	1.3-1.5	3.0	BZ	-	3.0	1.5	1.4-1.5	3.0	BZ	-
4.0	1.0	1.0-1.1	4.0	BZ	-	4.0	1.2	1.1-1.3	4.0	BZ	-	4.0	1.3	1.3-1.4	4.0	BZ	-

2MSR			2MSP			2MCR			2MCP			2MNR			2MNP		
Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	0	0 -0.1	0.3	BZ	-	0.3	0.2	0 -0.4	0.3	BZ	-	0.3	0.5	0.4-0.6	0.3	BZ	-
1.2	0.3	0.2-0.4	1.2	BZ	-	1.2	0.2	0.2-0.3	1.2	BZ	-	1.2	0.4	0.2-0.5	1.2	BZ	-
2.1	0.5	0.4-0.6	2.1	BZ	-	2.1	0.7	0.6-0.8	2.1	BZ	-	2.1	0.7	0.6-0.8	2.1	BZ	-
3.0	0.8	0.7-0.9	3.0	BZ	-	3.0	1.3	1.2-1.4	3.0	BZ	-	3.0	1.3	1.2-1.3	3.0	BZ	-

TABLE 3 (Continued)

August 16, 1978 Ohio River El 538 MSL

3SSR Depth m	Velocity x̄	Velocity Range	3SCR Depth m	Velocity x̄	Velocity Range	3SNR Depth m	Velocity x̄	Velocity Range	3SNR Depth m	Velocity x̄	Velocity Range	3MSP Depth m	Velocity x̄	Velocity Range
0.3	0.2	0.2-0.3	0.3	0.1	0 -0.1	0.3	0.1	0.1-0.2	0.3	0.5	0.5-0.6	0.3	BZ	-
1.2	0.3	0.3-0.4	1.2	0.1	0 -0.1	1.2	0.7	0.7-0.8	1.2	1.2	1.1-1.3	1.2	BZ	-
2.1	1.8	1.8-1.9	2.1	1.1	1.1-1.2	2.1	1.0	0.9-1.0	2.1	1.8	1.7-1.9	2.1	BZ	-
3.4	1.5	1.4-1.6	3.4	1.3	1.3-1.4	3.4	1.0	1.0-1.1	3.4	2.2	2.1.2.2	3.4	BZ	-

3MCR Depth m	Velocity x̄	Velocity Range	3MCP Depth m	Velocity x̄	Velocity Range	3MNR Depth m	Velocity x̄	Velocity Range	3MNP Depth m	Velocity x̄	Velocity Range	3NSR Depth m	Velocity x	Velocity Range
0.3	0.4	0.3-0.5	0.3	0.1	0 -0.1	0.3	0.4	0.3-0.5	0.3	BZ	-	0.3	0.2	0.1-0.3
1.2	0.7	0.6-0.8	1.2	BZ	-	1.2	0.4	0.3-0.5	1.2	BZ	-	1.2	0.3	0.2-0.3
2.1	2.1	1.8-2.3	2.1	BZ	-	2.1	2.5	2.4-2.6	2.1	BZ	-	2.1	0.5	0.4-0.6
3.4	1.4	1.3-1.5	3.4	BZ	-	3.4	2.1	2.0-2.2	3.4	BZ	-	3.4	1.3	1.2-1.4

3NSP Depth m	Velocity x̄	Velocity Range	3NCR Depth m	Velocity x̄	Velocity Range	3NCP Depth m	Velocity x̄	Velocity Range	3NNR Depth m	Velocity x̄	Velocity Range	3NNP Depth m	Velocity x̄	Velocity Range
0.3	0.1	0 -0.2	0.3	BZ	-	0.3	0.3	0.2-0.4	0.3	0	0 - 0	0.3	BZ	-
1.2	BZ	-	1.2	0	BZ -0.1	1.2	0.3	0.2-0.4	1.2	0.3	0.2-0.4	1.2	BZ	-
2.1	BZ	-	2.1	0.4	0.3-0.5	2.1	BZ	-	2.1	0.4	0.2-0.5	3.4	BZ	-
3.4	BZ	-	3.4	2.0	1.7-2.1	3.4	BZ	-	3.4	2.8	2.7-3.0	3.4	BZ	-

September 13, 1978 Ohio River El 539 MSL

1MSR Depth m	Velocity x̄	Velocity Range	1MSP Depth m	Velocity x̄	Velocity Range	1MCR Depth m	Velocity x̄	Velocity Range	1MCP Depth m	Velocity x̄	Velocity Range	1MNR Depth m	Velocity x̄	Velocity Range	1MNP Depth m	Velocity x̄	Velocity Range
0.3	0.4	0.3-0.4	0.3	BZ	-	0.3	BZ	-	0.3	BZ	-	0.3	0.6	0.4-0.7	0.3	BZ	-
1.2	0.5	0.4-0.6	1.2	BZ	-	1.2	0	0 - 0	1.2	BZ	-	1.2	0.6	0.5-0.7	1.2	BZ	-
2.1	1.2	1.1-1.3	2.1	BZ	-	2.1	1.4	1.2-1.5	2.1	BZ	-	2.1	1.3	1.2-1.5	2.1	BZ	-
3.4	1.5	1.4-1.6	3.4	BZ	-	3.4	1.2	1.1-1.4	3.4	BZ	-	3.4	1.7	1.7-1.7	3.4	BZ	-
4.0	1.4	1.3-1.6	4.0	BZ	-	4.0	1.5	1.2-1.6	4.0	BZ	-	4.0	1.4	1.3-1.5	4.0	BZ	-

TABLE 3 (Continued)

1NSR			1NSP			1NCR			1NCP			1HNR			1NNP		
Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	0.1	0.1-0.1	0.3	BZ	-	0.3	BZ	-	0.3	BZ	-	0.3	0.1	0.1-0.1	0.3	BZ	-
1.2	0.2	0 -0.3	1.2	BZ	-	1.2	0.3	0.1-0.4	1.2	BZ	-	1.2	0.2	0.1-0.3	1.2	BZ	-
2.1	0.2	0.2-0.3	2.1	BZ	-	2.1	0.9	0.7-1.0	2.1	BZ	-	2.1	0.5	0.5-0.5	2.1	BZ	-
3.4	1.5	1.2-1.6	3.4	BZ	-	3.4	1.4	1.2-1.5	3.4	BZ	-	3.4	2.0	1.9-2.2	3.4	BZ	-
4.0	2.0	2.0-2.0	4.0	BZ	-	4.0	1.0	0.9-1.2	4.0	BZ	-	4.0	2.2	2.1-2.2	4.0	BZ	-
5.2	1.3	1.2-1.5				5.2	1.4	1.3-1.4	5.2	BZ	-	5.2	0.4	0.3-0.6	5.2	BZ	-

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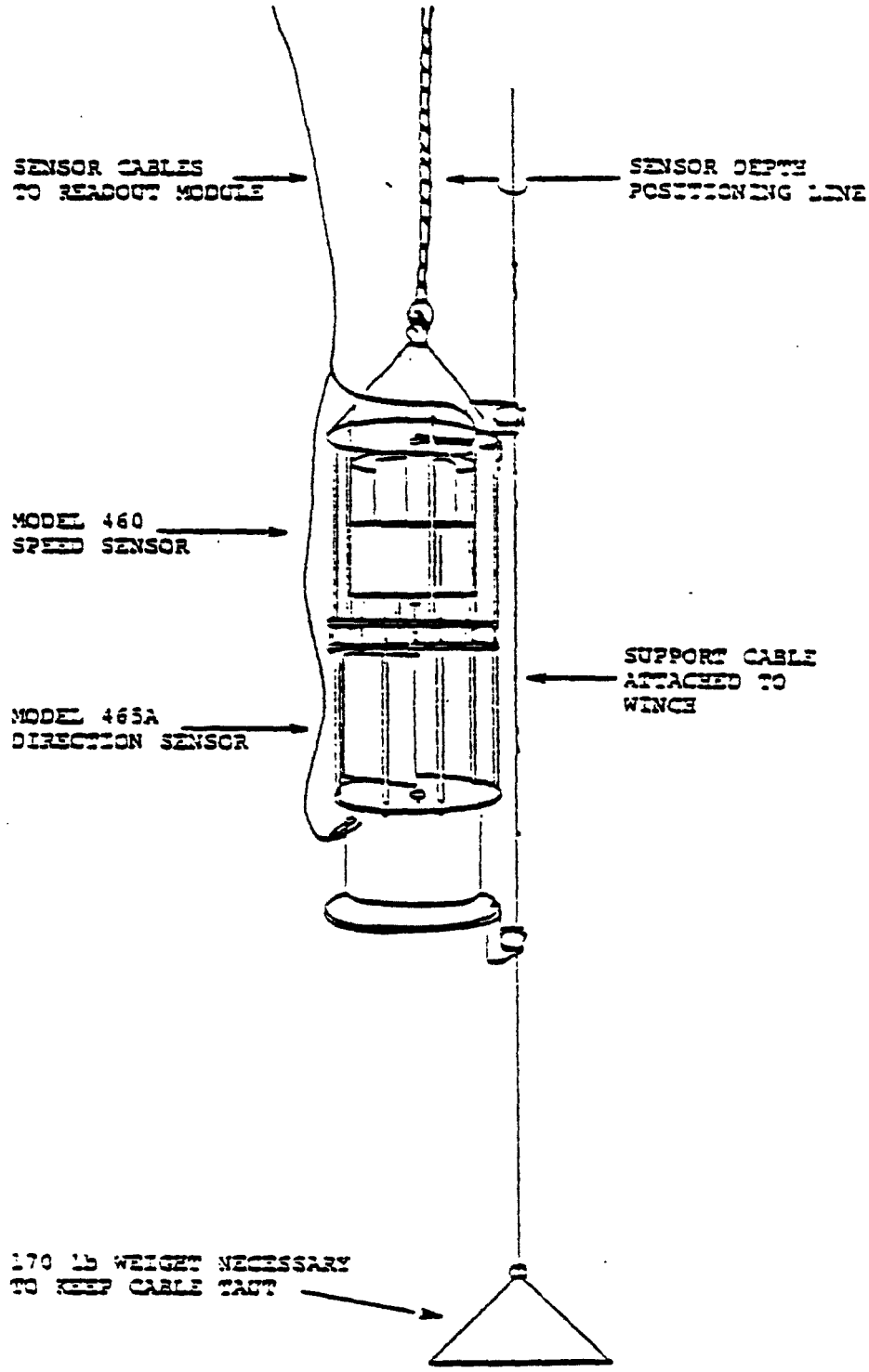
1MCR			1MCP			2MCR			2MCP			3MCR		
Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	1.4	1.4-1.5	0.3	BZ	-	0.3	0.3	0.2-0.4	0.3	BZ	-	0.3	BZ	-
1.0	0.6	0.4-0.6	1.0	BZ	-	1.0	0.5	0.4-0.6	1.0	BZ	-	1.0	0.6	0.6-0.7
2.0	0.5	0.4-0.6	2.0	BZ	-	2.0	1.2	1.2-1.3	2.0	BZ	-	1.5	1.5	1.5-1.6
3.0	1.5	1.4-1.6	3.0	BZ	-	3.0	1.8	1.7-1.8	3.0	BZ	-			
3.4	1.3	1.2-1.3	3.4	BZ	-	4.0	1.8	1.8-1.8	4.0	BZ	-			
						4.3	1.7	1.7-1.7	4.3	BZ	-			

3MCP			4MCR			4MCP			5MCR			5MCP		
Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity		Depth	Velocity	
m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range	m	$\bar{x}$	Range
0.3	0.2	0.2-0.3	0.3	0.3	0.3-0.3	0.3	BZ	-	0.3	0.6	0.6-0.6	0.3	BZ	-
1.0	BZ	-	1.0	0.3	0.3-0.4	1.0	BZ	-	1.0	2.2	2.2-2.2	1.0	BZ	-
1.5	BZ	-	2.0	0.8	0.6-0.9	2.0	BZ	-	2.0	1.9	1.9-1.9	2.0	BZ	-
			3.0	1.2	1.2-1.3	3.0	BZ	-	3.0	1.7	1.7-1.7	3.0	BZ	-

FIGURE 1

HYDRO PRODUCTS SYSTEM ARRANGEMENT



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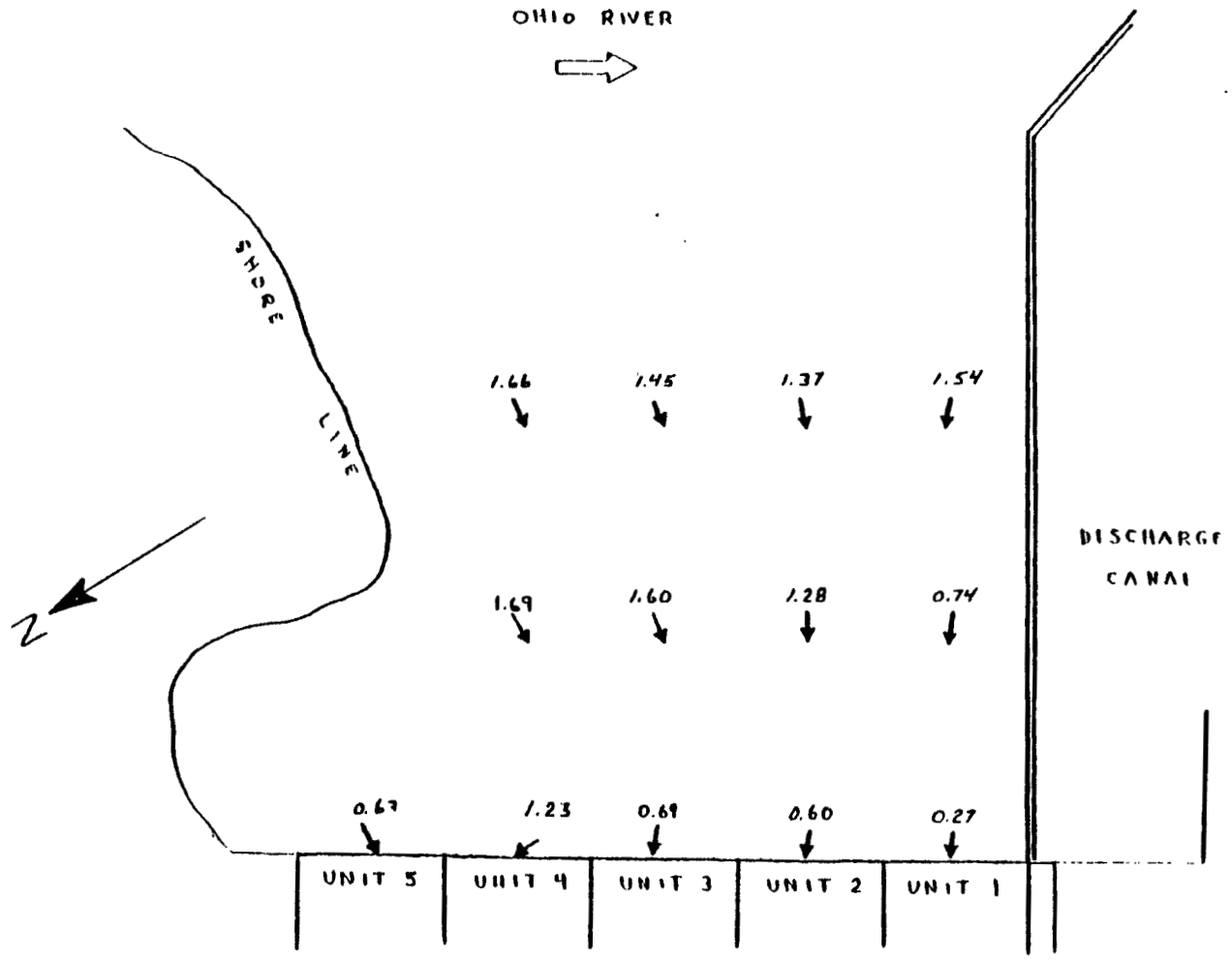

FIGURE 2

VELOCITY (ft/sec) AND DIRECTION OF CURRENTS IN FRONT OF THE KYGER CREEK STATION INTAKE STRUCTURE SURFACE READINGS

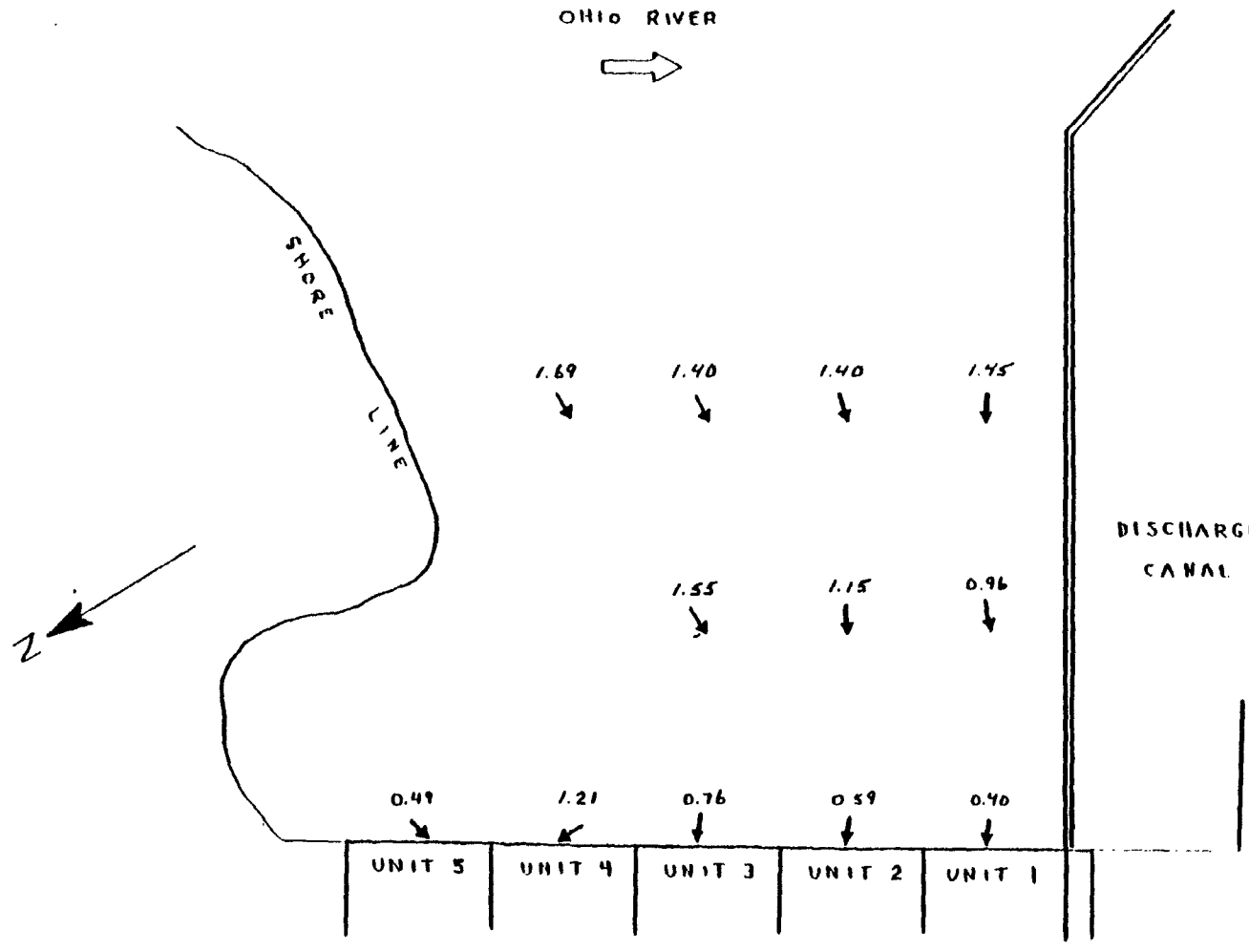

FIGURE 3

VELOCITY (ft/sec) AND DIRECTION OF CURRENTS IN FRONT OF THE KYGER CREEK STATION INTAKE STRUCTURE ONE METER DEPTH READINGS

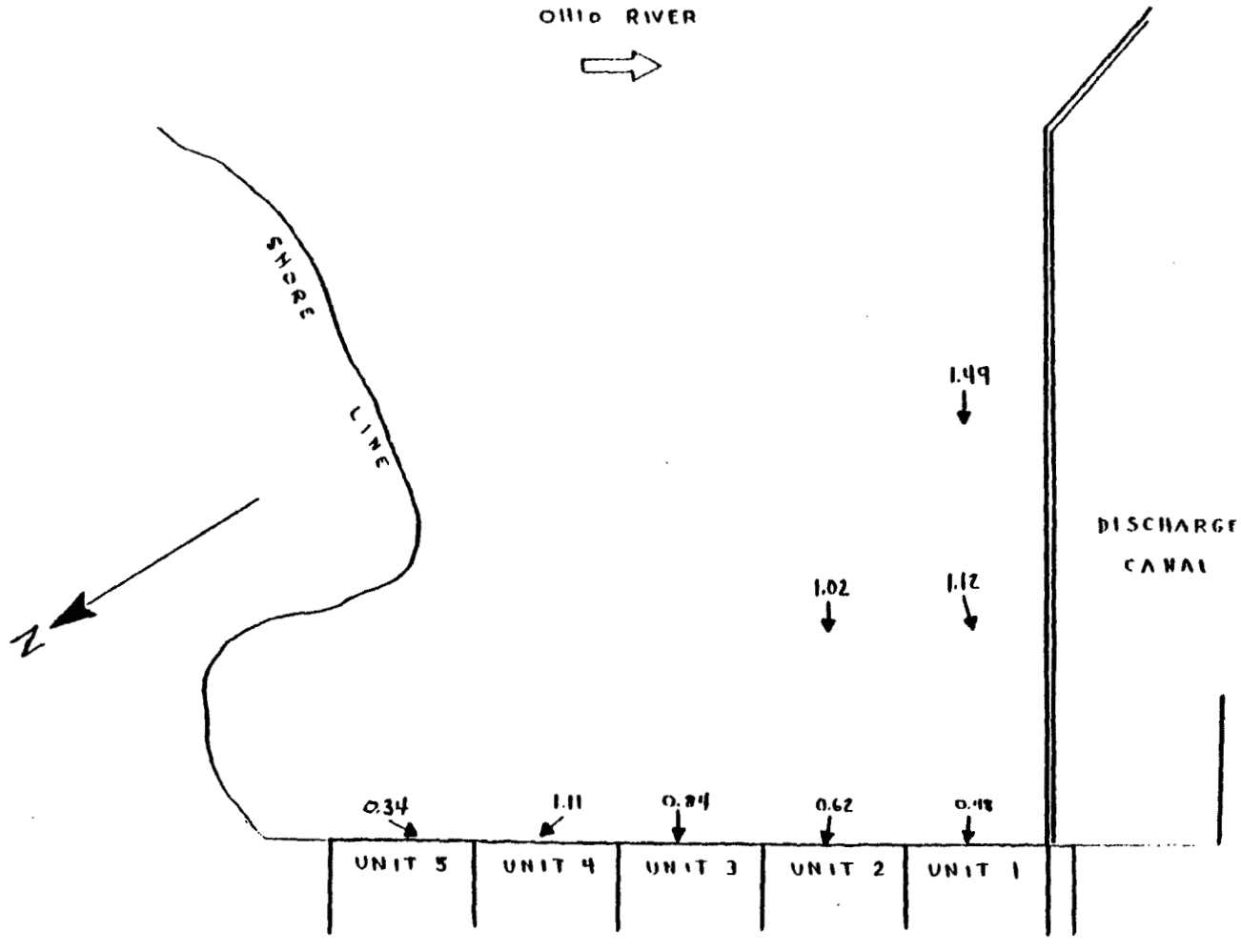

FIGURE 4

VELOCITY (ft/sec) AND DIRECTION OF CURRENTS IN FRONT OF THE KYGER CREEK STATION INTAKE STRUCTURE TWO METER DEPTH READINGS

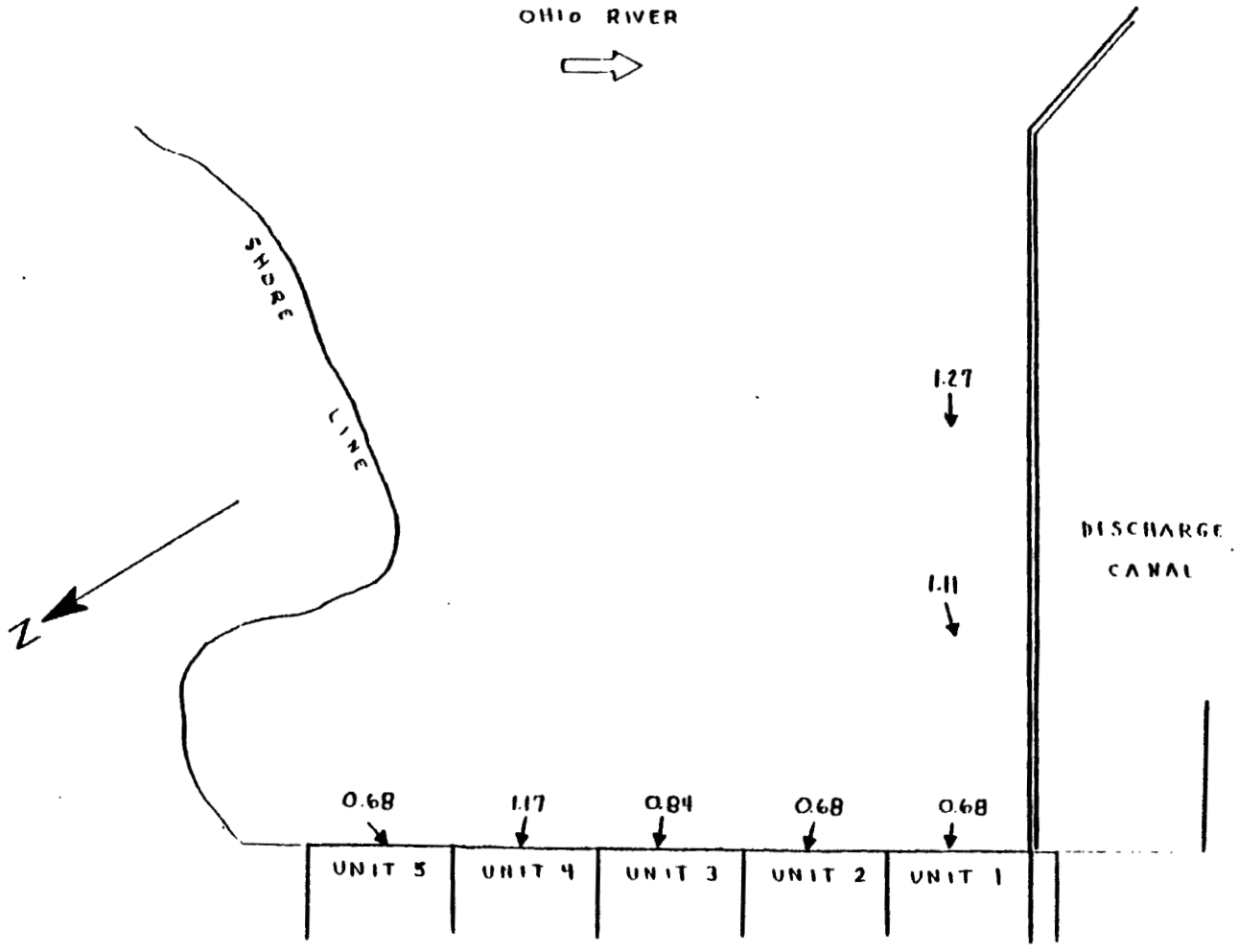

FIGURE 5

VELOCITY (ft/sec) AND DIRECTION OF CURRENTS IN FRONT OF THE KYGER CREEK STATION INTAKE STRUCTURE THREE METER DEPTH READINGS

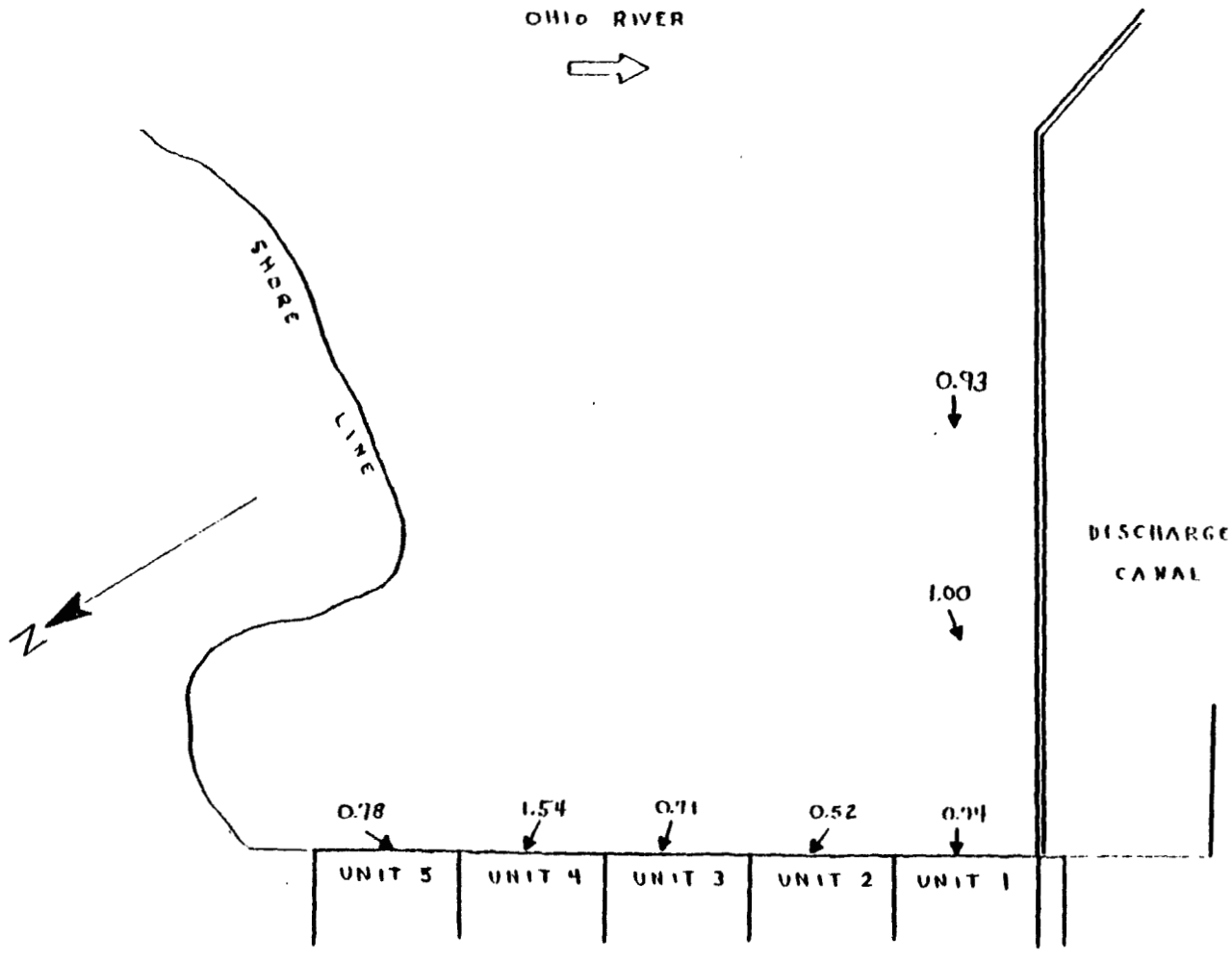

FIGURE 6

VELOCITY (ft/sec) AND DIRECTION OF CURRENTS IN FRONT OF THE KYGER CREEK STATION INTAKE STRUCTURE FOUR METER DEPTH READINGS

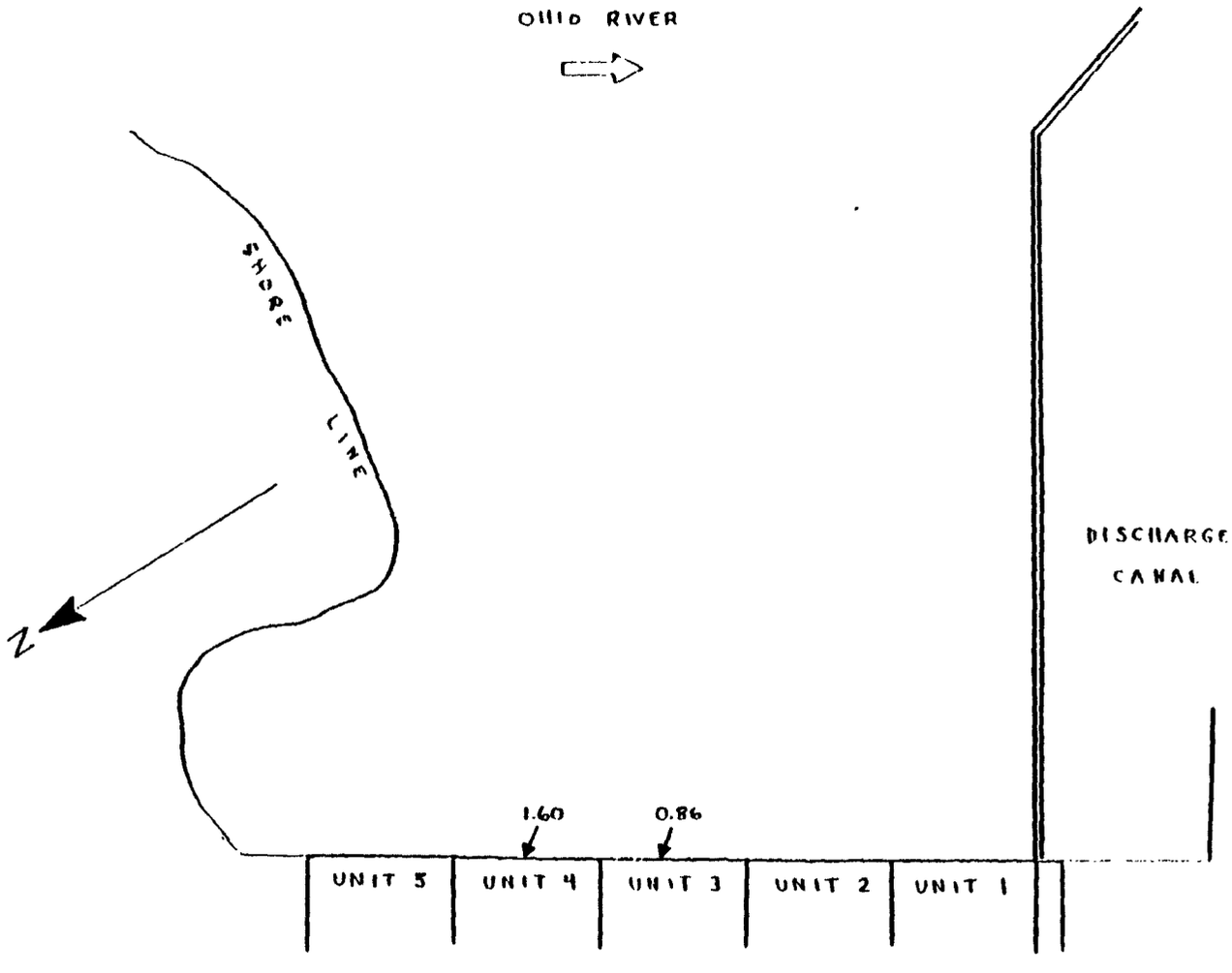

FIGURE 7

VELOCITY (ft/sec) AND DIRECTION OF CURRENTS IN FRONT OF THE KYGER CREEK STATION INTAKE STRUCTURE
FIVE METER DEPTH READINGS

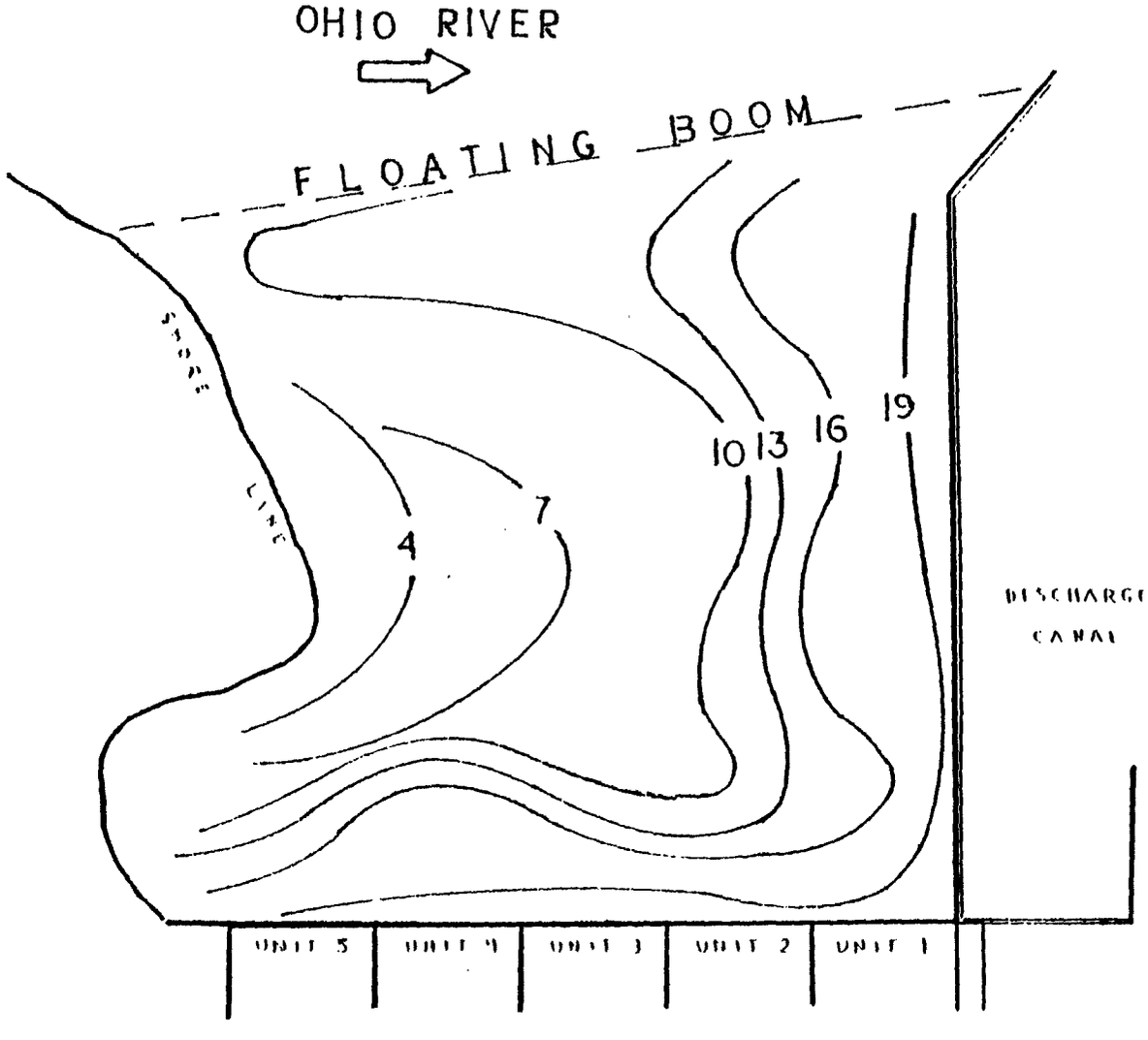

FIGURE 8

BOTTOM ISOPLETHS (FT) IN FRONT OF THE
KYGER CREEK STATION INTAKE STRUCTURE JULY 12, 1979

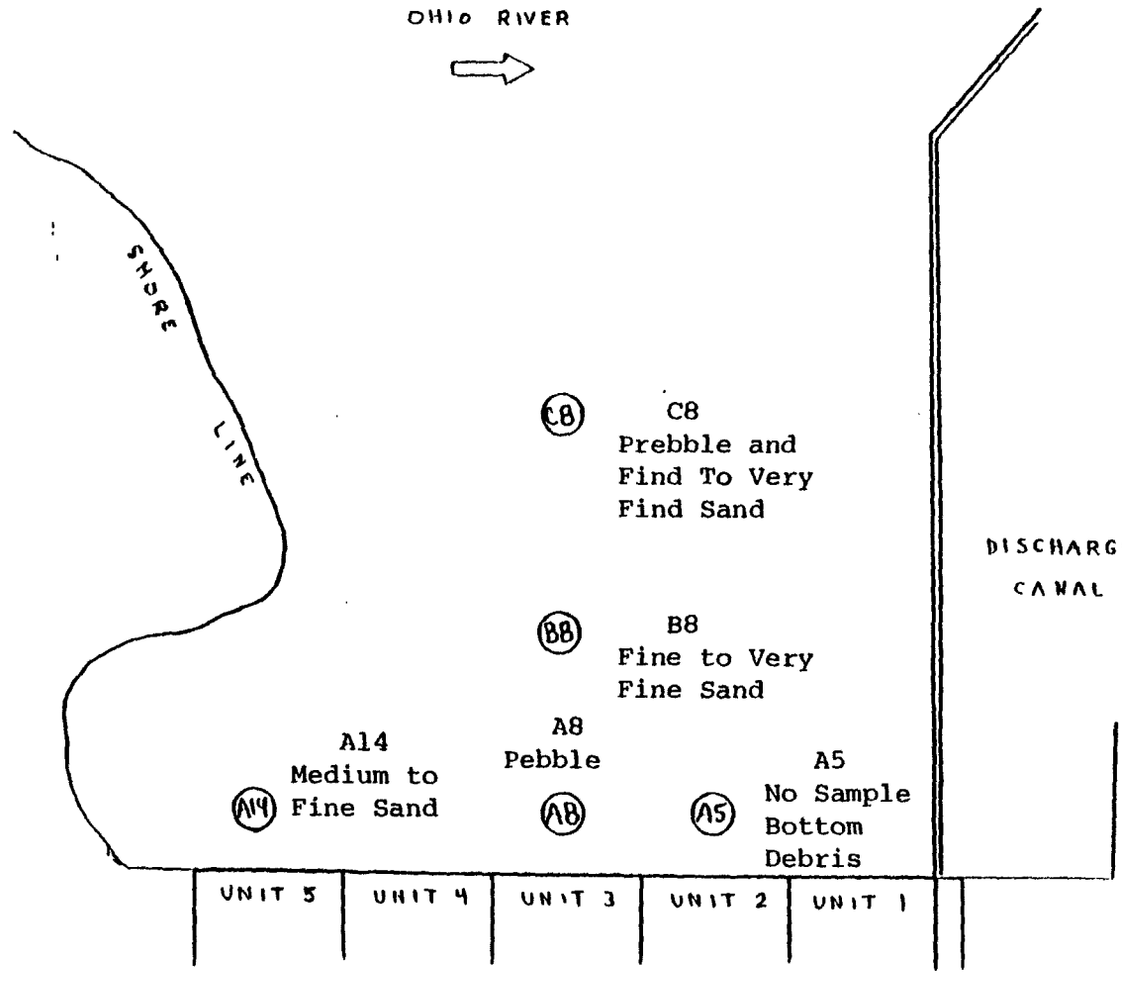

FIGURE 9

LOCATION AND DISCRIPTION OF BOTTOM SEDIMENTS IN FRONT OF THE KYGER CREEK STATION INTAKE STRUCTURE. SAMPLES COLLECTED ON JULY 12, 1979