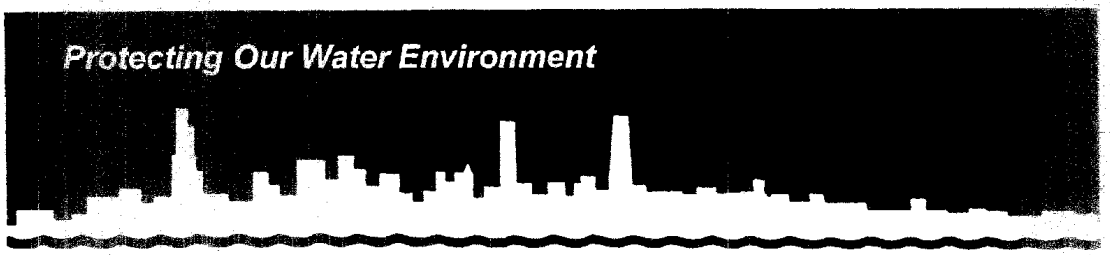

Metropolitan Water Reclamation District of Greater Chicago

RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 03-6

FISH COMMUNITY IN SALT CREEK DURING 1998 AND 1999

February 2003

Metropolitan Water Reclamation District of Greater Chicago
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FISH COMMUNITY IN SALT CREEK DURING 1998 AND 1999

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ACKNOWLEDGMENTS

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DISCLAIMER

Mention of proprietary equipment and chemicals in this report does not constitute endorsement by the Metropolitan Water Reclamation District of Greater Chicago (District).

SUMMARY

During the summer of 1998 and 1999, the fish community was assessed at five stations in Salt Creek extending from the Busse Woods Reservoir Dam to the junction with the Des Plaines River in Cook County. Fish were collected by electrofishing and seining. Community characteristics assessed included species composition, relative abundance, weight, and length.

The results of four fish surveys conducted at five stations in Salt Creek during the summer of 1998 and 1999 are as follows:

1. Twenty-three species of fish were identified.
2. A total of 1,541 fish were collected.
3. The fish community was composed primarily of bluegill sunfish, bluntnose minnows, largemouth bass, pumpkinseed sunfish, spotfin shiners, and green sunfish.
4. The sunfish family were dominant in the upper reaches of Salt Creek, while the lower segments were composed primarily of minnows.
5. A higher percentage of game fish (79-83 percent) were collected from the upper reaches of Salt Creek compared to stations in the lower reaches (12-38 percent).

INTRODUCTION

In 1975, the Research and Development (R&D) Department initiated an annual comprehensive environmental monitoring program to characterize the biological communities in Chicago area shallow water and deep draft waterways. The primary objective of the subject monitoring program is to assess water quality based on the abundance and distribution of the fish and benthic invertebrate communities. Over the years, the monitoring program has served to define biological trends and, where appropriate, to assess the effects of pollution control activities implemented by the District on instream water quality. This report describes the results of fish surveys conducted during 1998 and 1999 in the Salt Creek watershed in Cook County, Illinois. Benthic invertebrates were not monitored during 1998-99.

DESCRIPTION OF STUDY AREA

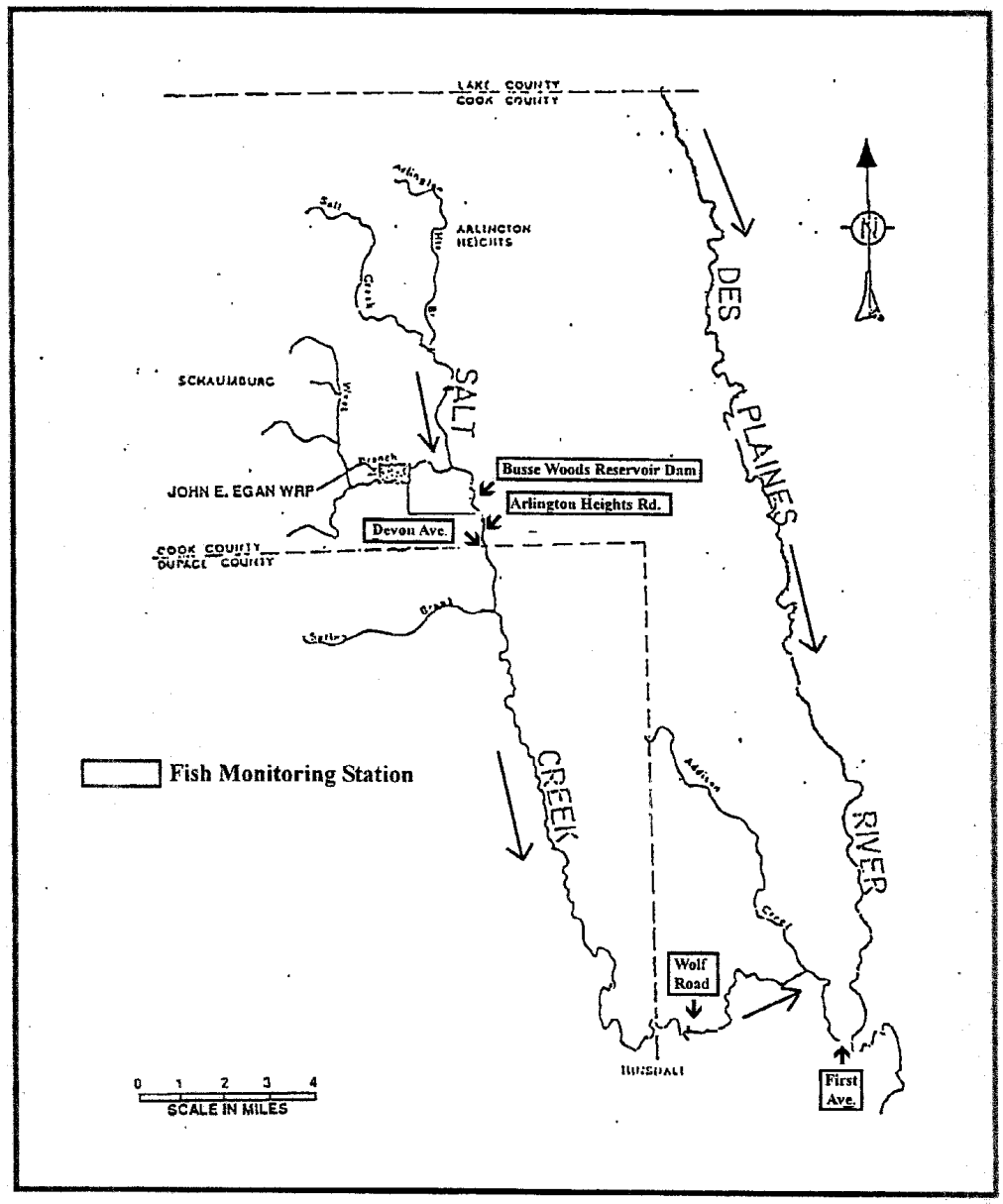
The headwaters of Salt Creek originate with the confluence of several small streams west of Palatine, Illinois (Polls, Lanyon, and Lue-Hing, 1979). Salt Creek is approximately 45 miles in length. The 150 square mile Salt Creek watershed is located in Cook and DuPage Counties. Approximately 60 percent of the Salt Creek watershed (90 square miles) is in Cook County. The remaining 40 percent (60 square miles) is in DuPage County (Ogata, 1975).

Five monitoring stations were established on Salt Creek in Cook County. Three stations (Busse Woods Reservoir Dam, Arlington Heights Road, and Devon Avenue) were located in the upper reaches of Salt Creek (north of DuPage County), and two stations (Wolf Road and First Avenue) were in the lower segments (east of DuPage County). The location and description of the five monitoring stations are shown in Figure 1 and Table 1, respectively.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

FIGURE 1

FISH MONITORING STATIONS ON SALT CREEK



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

DESCRIPTION OF FISH MONITORING STATIONS ON SALT CREEK

Station Name	Location of Monitoring Station
Busse Woods Reservoir Dam	Approximately 100 meters below Busse Woods Reservoir Dam; Immediately above John E. Egan Water Reclamation Plant (WRP) effluent outfall.
Arlington Heights Road	Approximately 5 meters below Arlington Heights Road bridge; Approximately 400 meters below John E. Egan WRP effluent outfall.
Devon Avenue	Approximately 5 meters above Devon Avenue bridge.
Wolf Road	Approximately 200 meters above Wolf Road bridge; Five meters above footbridge.
First Avenue	Approximately 5 meters above First Avenue bridge.

MATERIALS AND METHODS

Electrofishing and Seining

Fish were collected in Salt Creek during the following periods: July 17 through 29, 1998, August 31 through September 9, 1998, July 21 through August 5, 1999, and September 16 through 29, 1999. Fish collection equipment included the following:

1. A direct current (DC) backpack electrofisher was used to collect fish in Salt Creek. The water was electrified with 0.7 to 1.0 amps of current, stunning the fish. In most instances, two 40-meter long backpack electrofisher collections were conducted at each station. A 40-meter reach of the creek was electrified by moving upstream parallel to the bank. Additional personnel followed the electrofisher collecting the stunned fish with dip nets. Following the first collection, a second 40-meter electrofishing survey was conducted on the opposite bank. If the creek was less than five meters wide, electrofishing occurred only once along a 40-meter reach. The total electrofishing time during each 40-meter collection was noted. The total

shocking time for a 40-meter collection in Salt Creek ranged from 13 to 36 minutes.

2. A 25-foot bag seine with 3/16-inch mesh was also used to collect fish. Staff pulled the seine for 40-meters traveling upstream parallel to the bank. In most instances, a separate 40-meter seine collection occurred along each bank.

The total area monitored varied with the width of the creek. For example, a location 20-meters wide sampled with two 40-meter electrofisher collections and two 40-meter seine collections would equate to a monitoring area of 800 square meters.

Fish Processing

In the field, large fish (greater than 150 mm) were identified to species, weighed to the nearest gram or nearest 0.1 gram (depending on size), measured for standard and total length to the nearest millimeter, and examined for the incidence of disease, parasites, or other anomalies. Following processing, the large fish were returned live to the creek. Small fish (less than 150 mm in length) were preserved in 10 percent (v/v) formalin and returned to the laboratory for further analysis. Small fish were processed in a similar manner as the large fish, except that they were weighed to the nearest 0.01 gram.

RESULTS AND DISCUSSION

During the 1998 and 1999 surveys, 23 species of fish were collected from the five monitoring stations on Salt Creek (Table 2). A combined total of 1,541 fish were collected from all locations during the two-year study (Table 3). The relative abundance, species composition, weight, and length measurements of fish collected at each of the five monitoring stations are presented in Appendix Tables AI-1 through AIV-5.

Overall, six species, accounted for 80 percent of the fish community in Salt Creek during the 1998 and 1999 surveys. The six species included bluegill sunfish (20 percent), bluntnose minnows (18 percent), largemouth bass (14 percent), pumpkinseed sunfish (10 percent), spotfin shiners (9 percent), and green sunfish (9 percent). Sunfish were dominant in the upper reaches of Salt Creek while the minnow family composed most of the catch in the lower segments (Table 3).

Game fish collected from Salt Creek included northern pike, yellow bullhead, green sunfish, pumpkinseed sunfish, orangespotted sunfish, bluegill sunfish, smallmouth bass, largemouth bass, black crappie, and hybrid sunfish. The highest percentage of game fish were collected in the upper reaches of Salt Creek compared to stations monitored further downstream (Table 3).

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

COMMON AND SCIENTIFIC NAMES OF FISH COLLECTED FROM SALT CREEK DURING 1998 AND 1999

Common Name[1]	Scientific Name[1]
PIKE FAMILY	ESOCIDAE
Northern pike	*Esox lucius*
MINNOW FAMILY	CYPRINIDAE
Goldfish	*Carassius auratus*
Common carp	*Cyprinus carpio*
Carp x Goldfish hybrid	*Cyprinus carpio x Carassius auratus*
Golden shiner	*Notemigonus crysoleucas*
Spotfin shiner	*Cyprinella spiloptera*
Pugnose minnow	*Opsopoeodus emiliae*
Sand shiner	*Notropis stramineus*
Bluntnose minnow	*Pimephales notatus*
Fathead minnow	*Pimephales promelas*
Creek chub	*Semotilus atromaculatus*
SUCKER FAMILY	CATOSTOMIDAE
White sucker	*Catostomus commersoni*
CATFISH FAMILY	ICTALURIDAE
Yellow bullhead	*Ameiurus natalis*
KILLIFISH FAMILY	CYPRINODONTIDAE
Blackstripe topminnow	*Fundulus notatus*
SILVERSIDES FAMILY	ATHERINIDAE
Brook silversides	*Labidesthes sicculus*
SUNFISH FAMILY	CENTRARCHIDAE
Green sunfish	*Lepomis cyanellus*
Pumpkinseed	*Lepomis gibbosus*
Orangespotted sunfish	*Lepomis humilis*
Bluegill	*Lepomis macrochirus*
Smallmouth bass	*Micropterus dolomieu*

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

COMMON AND SCIENTIFIC NAMES OF FISH COLLECTED FROM SALT CREEK DURING 1998 AND 1999

Common Name[1]	Scientific Name[1]
SUNFISH FAMILY (Continued)	CENTRARCHIDAE
Largemouth bass	*Micropterus salmoides*
Black crappie	*Pomoxis nigromaculatus*
Green sunfish x Pumpkinseed sunfish hybrid	*L. cyanellus x L. gibbosus*
Green sunfish x Bluegill hybrid	*L. cyanellus x L. macrochirus*
PERCH FAMILY	PERCIDAE
Johnny darter	*Etheostoma nigrum*
Blackside darter	*Percina maculata*

[1]Common and scientific names from Robins, 1991.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

FISH COMMUNITY CHARACTERISTICS FOR MONITORING STATIONS ON SALT CREEK, 1998 AND 1999

Monitoring Station	Total Number of Species	Total Number of Fish	Total Weight (Kg)	Green Sunfish (%)	Game Fish (%)	Dominant Species (%)
Busse Woods Reservoir	13	596	5.52	5	79	Bluegill (29%); pumpkinseed sunfish (24%); largemouth bass (16%); blackstripe topminnow (10%)
Arlington Heights Road	10	240	4.42	14	83	Bluegill (31%); largemouth bass (27%); green sunfish (14%)
Devon Avenue	10	117	0.74	21	80	Largemouth bass (30%); green sunfish (21%); bluegill (12%); orangespotted sunfish (12%)
Wolf Road	14	240	4.98	15	38	Bluntnose minnow (29%); green sunfish (15%); bluegill (13%); creek chub (10%); spotfin shiner (10%)
First Avenue	17	348	4.23	4	12	Bluntnose minnow (49%); spotfin shiner (24%)

A discussion of selected characteristics of the fish community assessed at five monitoring stations in Salt Creek during 1998 and 1999 follows.

Busse Woods Reservoir Dam

During 1998-1999, 13 fish species were collected from Salt Creek just below the Busse Woods Reservoir Dam (Table 3). Bluegills (29 percent), pumpkinseed sunfish (24 percent), largemouth bass (16 percent), and blackstripe topminnows (10 percent) were the predominant species, and accounted for 79 percent of the total catch of 596 fish. Seven game fish species also accounted for 79 percent of the catch, including bluegill, pumpkinseed sunfish, largemouth bass, yellow bullhead, green sunfish, orangespotted sunfish, green sunfish x bluegill hybrid sunfish, and black crappie. The total weight of fish collected below the Busse Woods Reservoir Dam during 1998 and 1999 was 5.52 kilograms.

Arlington Heights Road

During 1998-1999, 10 fish species were collected from Salt Creek at Arlington Heights Road (Table 3). Bluegills (31 percent), largemouth bass (27 percent), and green sunfish (14 percent) were the predominant species, and accounted for 72 percent of the total catch of 240 fish. Six game fish species, plus one hybrid, accounted for 83 percent of the catch,

including bluegill, largemouth bass, green sunfish, yellow bullhead, pumpkinseed sunfish, orangespotted sunfish, and pumpkinseed x bluegill sunfish. The total weight of fish collected at Arlington Heights Road during 1998 and 1999 was 4.42 kilograms.

Devon Avenue

During 1998-1999, 10 fish species were collected from Salt Creek at Devon Avenue (Table 3). Largemouth bass (30 percent), green sunfish (21 percent), bluegills (12 percent), and orangespotted sunfish (12 percent) were the predominant species, and accounted for 75 percent of the total catch of 117 fish. Six game fish species, plus one hybrid, accounted for 79 percent of the catch, including bluegill, largemouth bass, green sunfish, orangespotted sunfish, yellow bullhead, pumpkinseed sunfish, and pumpkinseed x bluegill sunfish hybrid. The total weight of fish collected at Devon Avenue during 1998 and 1999 was 0.74 kilograms.

Wolf Road

During 1998-1999, 14 fish species were collected from Salt Creek at Wolf Road (Table 3). Bluntnose minnows (29 percent), bluegills (13 percent), green sunfish (15 percent), creek chubs (10 percent), and spotfin shiners (10 percent) were the predominant species, and accounted for 77 percent of

the total catch of 240 fish. Seven game fish species accounted for 38 percent of the catch, including bluegill, green sunfish, yellow bullhead, pumpkinseed sunfish, orangespotted sunfish, smallmouth bass, and largemouth bass. The total weight of fish collected at Wolf Road during 1998 and 1999 was 4.98 kilograms.

First Avenue

During 1998-1999, 17 fish species were collected from Salt Creek at First Avenue (Table 3). Bluntnose minnows (49 percent) and spotfin shiners (24 percent) were the predominant species, and accounted for 73 percent of the total catch of 348 fish. Seven game fish species accounted for 12 percent of the catch, including northern pike, yellow bullhead, green sunfish, orangespotted sunfish, bluegill, smallmouth bass, and largemouth bass. The total weight of fish collected at First Avenue during 1998 and 1999 was 4.23 kilograms.

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2. Ogata, K. M., Drainage Areas for Illinois Streams, United States Geological Survey, Water-Resources Investigations 13-75, United States Geological Survey, Water Resources Division, Champaign, Illinois, 1975.

3. Robins, C. R., Common and Scientific Names of Fishes from the United States and Canada, Special Publication 20, American Fisheries Society, Bethesda, Maryland, 183 pp., 1991.

APPENDIX AI

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED FROM SALT CREEK DURING JULY 17 THROUGH JULY 29, 1998

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-1

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED BELOW BUSSE WOODS RESERVOIR DAM ON SALT CREEK, JULY 29, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	29	15.9	385.8	13.3	7.9	30.6	91	78	121
Green sunfish	23	12.6	328.7	14.3	5.5	26.4	92	68	121
Largemouth bass	42	23.1	130.8	3.1	1.6	5.6	63	51	80
Orangespotted sunfish	7	3.8	56.0	8.0	4.8	10.9	77	67	84
Pumpkinseed	78	42.9	1,203.1	15.4	8.4	27.5	93	77	113
Yellow bullhead	3	1.6	136.4	45.5	15.3	73.9	146	108	174
Total	182	100.0	2,240.8						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-2

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT ARLINGTON HEIGHTS ROAD ON SALT CREEK, JULY 28, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	15	17.6	292.7	19.5	4.8	47.5	100	67	134
Bluntnose minnow	7	8.2	33.0	4.7	3.6	5.6	75	70	79
Green sunfish	14	16.5	170.4	12.2	4.2	21.1	85	63	104
Largemouth bass	37	43.5	93.8	2.5	1.2	4.7	60	47	75
Pumpkinseed	1	1.2	19.4	19.4	19.4	19.4	100	100	100
Spotfin shiner	10	11.8	64.4	6.4	2.5	9.2	83	65	96
Yellow bullhead	1	1.2	7.4	7.4	7.4	7.4	85	85	85
Total	85	100.0	681.1						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-3

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT DEVON AVENUE ON SALT CREEK, JULY 23, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Blackstripe topminnow	2	8.7	5.3	2.7	2.5	2.9	64	62	66
Bluegill	3	13.0	92.0	30.7	21.7	47.2	114	103	132
Bluntnose minnow	2	8.7	7.7	3.8	0.2	7.5	57	29	84
Brook silversides	6	26.1	1.4	0.2	0.1	0.4	36	28	45
Green sunfish	2	8.7	35.9	18.0	5.8	30.1	91	68	114
Largemouth bass	5	21.7	15.4	3.1	1.8	4.9	64	53	72
Orangespotted sunfish	1	4.3	8.5	8.5	8.5	8.5	77	77	77
Pumpkinseed	2	8.7	31.4	15.7	11.7	19.7	92	86	98
Total	23	100.0	197.6						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-4

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT WOLF ROAD ON SALT CREEK, JULY 21, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	5	7.0	254.3	50.9	30.7	79.8	133	116	149
Bluntnose minnow	22	31.0	52.1	2.4	0.4	4.7	60	35	74
Creek chub	15	21.1	401.5	26.8	0.8	56.5	115	40	160
Goldfish	2	2.8	95.9	47.9	5.2	90.7	115	63	167
Green sunfish	8	11.3	148.5	18.6	5.6	44.0	92	68	123
Largemouth bass	3	4.2	8.9	3.0	2.2	3.6	63	58	67
Sand shiner	8	11.3	31.8	4.0	0.6	6.2	70	40	84
Spotfin shiner	7	9.9	60.5	8.7	3.1	10.8	89	65	97
Yellow bullhead	1	1.4	19.7	19.7	19.7	19.7	114	114	114
Total	71	100.0	1,073.1						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AI-5

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT FIRST AVENUE ON SALT CREEK, JULY 17, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	5	5.2	38.6	7.7	3.7	18.0	74	63	102
Bluntnose minnow	66	68.8	75.4	1.1	0.1	5.2	48	25	77
Creek chub	4	4.2	2.1	0.5	0.3	0.9	36	30	42
Fathead minnow	1	1.0	0.4	0.4	0.4	0.4	36	36	36
Goldfish	1	1.0	300.0	300.0	300.0	300.0	235	235	235
Johnny darter	1	1.0	0.3	0.3	0.3	0.3	32	32	32
Largemouth bass	2	2.1	2.9	1.5	0.8	2.1	51	43	59
Orangespotted sunfish	1	1.0	2.5	2.5	2.5	2.5	53	53	53
Sand shiner	2	2.1	4.1	2.0	1.0	3.0	59	49	68
Smallmouth bass	1	1.0	29.6	29.6	29.6	29.6	136	136	136
Spotfin shiner	10	10.4	17.5	1.8	0.6	3.7	54	40	70
White sucker	1	1.0	29.5	29.5	29.5	29.5	141	141	141
Yellow bullhead	1	1.0	167.7	167.7	167.7	167.7	230	230	230
Total	96	100.0	670.6						

APPENDIX AII

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED FROM SALT CREEK DURING AUGUST 31 THROUGH SEPTEMBER 9, 1998

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AII-1

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED BELOW BUSSE WOODS RESERVOIR DAM ON SALT CREEK, SEPTEMBER 9, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Black crappie	1	0.9	36.9	36.9	36.9	36.9	136	136	136
Bluegill	20	18.5	471.9	23.6	1.3	88.3	101	44	158
Bluegill x green sunfish	1	0.9	48.0	48.0	48.0	48.0	133	133	133
Bluntnose minnow	6	5.6	23.2	3.9	2.7	4.8	72	65	75
Brook silversides	25	23.1	45.5	1.8	1.2	2.3	71	60	76
Largemouth bass	28	25.9	133.6	4.8	2.1	8.2	72	60	87
Orangespotted sunfish	2	1.9	13.4	6.7	6.4	7.0	73	73	73
Pumpkinseed	23	21.3	534.7	23.3	12.5	45.4	104	88	124
White sucker	1	0.9	149.9	149.9	149.9	149.9	244	244	244
Yellow bullhead	1	0.9	116.7	116.7	116.7	116.7	202	202	202
Total	108	100.0	1,573.8						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AII-2

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT ARLINGTON HEIGHTS ROAD ON SALT CREEK, SEPTEMBER 4, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	15	24.6	75.9	5.1	0.6	30.0	56	35	118
Bluntnose minnow	12	19.7	36.4	3.0	0.9	5.4	65	46	78
Green sunfish	8	13.1	117.9	14.7	6.2	28.7	92	69	117
Largemouth bass	18	29.5	77.8	4.3	1.6	9.0	69	53	90
Pumpkinseed	1	1.6	24.7	24.7	24.7	24.7	106	106	106
Yellow bullhead	7	11.5	30.9	4.4	2.1	6.9	70	54	82
Total	61	100.0	363.6						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AII-3

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT DEVON AVENUE ON SALT CREEK, AUGUST 31, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	3	7.1	13.3	4.4	1.0	11.0	58	40	90
Bluntnose minnow	4	9.5	5.8	1.5	0.4	2.3	53	36	64
Green sunfish	3	7.1	19.9	6.6	0.9	10.5	66	35	82
Largemouth bass	27	64.3	109.2	4.0	1.6	8.6	69	52	94
Orangespotted sunfish	4	9.5	41.3	10.3	7.9	13.6	84	79	89
Pumpkinseed	1	2.4	19.5	19.5	19.5	19.5	100	100	100
Total	42	100.0	209.0						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AII-4

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT WOLF ROAD ON SALT CREEK, SEPTEMBER 2, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	3	5.5	72.0	24.0	12.0	42.0	106	87	131
Bluntnose minnow	26	47.3	53.9	2.1	0.2	7.3	56	30	86
Creek chub	5	9.1	78.1	15.6	3.5	28.7	104	69	134
Fathead minnow	4	7.3	2.0	0.5	0.4	0.6	38	36	40
Goldfish	1	1.8	14.7	14.7	14.7	14.7	91	91	91
Green sunfish	5	9.1	80.0	16.0	10.0	22.0	93	82	103
Largemouth bass	2	3.6	12.1	6.1	4.1	8.0	79	70	88
Sand shiner	2	3.6	4.9	2.4	0.3	4.6	55	31	78
Smallmouth bass	1	1.8	220.0	220.0	220.0	220.0	259	259	259
Spotfin shiner	3	5.5	9.4	3.1	2.7	3.5	68	65	70
White sucker	1	1.8	490.0	490.0	490.0	490.0	363	363	363
Yellow bullhead	2	3.6	750.0	375.0	270.0	480.0	281	256	305
Total	55	100.0	1,787.2						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AII-5

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT FIRST AVENUE ON SALT CREEK, SEPTEMBER 1, 1998

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	4	8.2	6.1	1.5	0.6	2.6	45	33	56
Bluntnose minnow	26	53.1	36.5	1.4	0.2	4.2	53	30	74
Creek chub	1	2.0	1.5	1.5	1.5	1.5	52	52	52
Fathead minnow	1	2.0	0.8	0.8	0.8	0.8	41	41	41
Goldfish	1	2.0	470.0	470.0	470.0	470.0	275	275	275
Green sunfish	1	2.0	1.0	1.0	1.0	1.0	38	38	38
Largemouth bass	1	2.0	4.4	4.4	4.4	4.4	74	74	74
Northern pike	1	2.0	53.1	53.1	53.1	53.1	213	213	213
Pugnose minnow	1	2.0	0.8	0.8	0.8	0.8	44	44	44
Sand shiner	2	4.1	2.6	1.3	1.1	1.5	52	48	55
Smallmouth bass	1	2.0	26.8	26.8	26.8	26.8	132	132	132
Spotfin shiner	8	16.3	14.9	1.9	1.0	3.3	56	47	67
White sucker	1	2.0	240.0	240.0	240.0	240.0	301	301	301
Total	49	100.0	858.3						

APPENDIX AIII

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED FROM SALT CREEK DURING JULY 21 THROUGH AUGUST 5, 1999

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-1

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED BELOW BUSSE WOODS RESERVOIR DAM ON SALT CREEK, AUGUST 5, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Blackstripe topminnow	11	12.2	31.2	2.8	2.3	4.4	65	60	74
Bluegill	38	42.2	136.1	3.6	1.0	38.2	54	40	126
Green sunfish	5	5.6	119.1	23.8	11.0	46.9	104	84	130
Green sunfish x bluegill	5	5.6	68.1	13.6	10.5	16.9	86	79	91
Largemouth bass	16	17.8	46.3	2.9	1.0	5.0	63	48	78
Orangespotted sunfish	4	4.4	92.7	23.2	2.9	60.0	77	54	101
Pumpkinseed	11	12.2	62.3	5.7	2.0	35.7	57	47	118
Total	90	100.0	555.8						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-2

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT ARLINGTON HEIGHTS ROAD ON SALT CREEK, JULY 29, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Blackstripe topminnow	2	4.1	4.4	2.2	1.5	2.9	59	52	66
Bluegill	16	32.7	145.4	9.1	0.3	45.6	69	25	134
Bluegill x pumpkinseed	1	2.0	7.6	7.6	7.6	7.6	75	75	75
Carp	1	2.0	2,094.0	2,094.0	2,094.0	2,094.0	514	514	514
Green sunfish	9	18.4	169.3	18.8	4.0	34.9	98	60	124
Largemouth bass	4	8.2	16.6	4.2	2.5	6.3	69	59	82
Orangespotted sunfish	1	2.0	8.1	8.1	8.1	8.1	73	73	73
Pumpkinseed	3	6.1	99.3	33.1	29.1	39.7	113	108	119
Spotfin shiner	8	16.3	53.3	6.7	3.5	10.4	84	67	97
Yellow bullhead	4	8.2	79.0	19.8	0.2	29.7	130	125	135
Total	49	100.0	2677.0						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-3

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT DEVON AVENUE ON SALT CREEK, AUGUST 3, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Blackstripe topminnow	1	3.3	2.6	2.6	2.6	2.6	64	64	64
Bluegill	2	6.7	39.1	19.6	0.6	38.5	80	34	126
Green sunfish	17	56.7	139.2	8.2	0.8	38.4	69	35	128
Largemouth bass	2	6.7	6.3	3.2	1.4	4.9	63	51	75
Orangespotted sunfish	6	20.0	42.5	7.1	2.4	11.4	72	55	83
Yellow bullhead	2	6.7	42.1	21.0	0.7	41.4	92	34	150
Total	30	100.0	271.7						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-4

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT WOLF ROAD ON SALT CREEK, JULY 22 AND JULY 27, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	7	11.3	232.1	33.2	0.5	71.0	107	32	150
Bluntnose minnow	6	9.7	17.8	3.0	0.2	5.4	62	25	77
Creek chub	3	4.8	42.8	14.3	1.3	39.3	84	48	145
Goldfish	3	4.8	24.7	8.2	6.0	11.3	75	66	83
Green sunfish	17	27.4	378.3	22.3	1.4	41.7	98	41	127
Largemouth bass	3	4.8	43.1	14.4	4.4	34.2	93	67	144
Orangespotted sunfish	3	4.8	93.9	31.3	15.1	40.8	116	93	127
Sand shiner	8	12.9	28.4	3.5	1.8	5.1	69	56	79
Spotfin shiner	10	16.1	66.1	6.6	2.9	14.7	81	63	111
Yellow bullhead	2	3.2	1.4	0.7	0.7	0.7	37	35	38
Total	62	100.0	928.6						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIII-5

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT FIRST AVENUE ON SALT CREEK, JULY 21, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluntnose minnow	58	51.3	43.4	0.8	0.1	6.4	37	24	85
Carp x goldfish	1	0.9	1,591.0	1,591.0	1,591.0	1,591.0	433	433	433
Creek chub	2	1.8	1.6	0.8	0.5	1.1	41	36	46
Fathead minnow	4	3.5	2.3	0.6	0.4	0.7	38	34	41
Goldfish	3	2.7	479.2	159.7	1.4	474.0	127	44	279
Green sunfish	5	4.4	63.4	12.7	0.3	25.8	76	25	101
Johnny darter	1	0.9	0.3	0.3	0.3	0.3	31	31	31
Largemouth bass	6	5.3	18.1	3.0	0.9	5.5	58	40	74
Sand shiner	8	7.1	6.0	0.8	0.4	1.9	43	36	60
Spotfin shiner	16	14.2	26.5	1.7	0.9	2.8	52	43	63
White sucker	7	6.2	9.6	1.4	1.0	2.1	48	44	57
Yellow bullhead	2	1.8	231.3	115.6	0.3	231.0	128	26	230
Total	113	100.0	2,472.6						

APPENDIX AIV

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED FROM SALT CREEK DURING SEPTEMBER 16 THROUGH SEPTEMBER 29, 1999

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-1

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED BELOW BUSSE WOODS RESERVOIR DAM ON SALT CREEK, SEPTEMBER 29, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Black crappie	1	0.5	22.7	22.7	22.7	22.7	123	123	123
Blackstripe topminnow	50	23.1	56.2	1.1	0.2	3.9	48	28	73
Bluegill	85	39.4	448.4	5.3	0.8	24.0	65	37	112
Bluntnose minnow	4	1.9	5.2	1.3	0.8	1.6	53	47	57
Brook silversides	9	4.2	14.8	1.9	1.5	2.2	72	67	78
Golden shiner	6	2.8	68.4	11.4	5.6	32.1	99	83	150
Largemouth bass	7	3.2	39.5	5.6	3.9	8.6	78	73	90
Orangespotted sunfish	10	4.6	58.5	5.9	2.0	19.9	68	51	105
Pumpkinseed	29	13.4	140.3	4.8	2.4	25.8	62	50	112
Spotfin shiner	12	5.6	11.5	1.0	0.7	1.2	48	44	52
White sucker	1	0.5	270.0	270.0	270.0	270.0	293	293	293
Yellow bullhead	2	0.9	10.3	5.2	3.9	6.4	79	73	85
Total	216	100.0	1,145.7						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-2

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT ARLINGTON HEIGHTS ROAD ON SALT CREEK, SEPTEMBER 22, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Blackstripe topminnow	1	2.3	0.9	0.9	0.9	0.9	47	47	47
Bluegill	28	63.6	515.2	18.4	0.9	96.6	86	40	169
Green sunfish	3	6.8	37.9	12.6	3.4	20.6	86	60	106
Largemouth bass	5	11.4	89.5	17.9	3.1	70.1	95	67	177
Orangespotted sunfish	1	2.3	5.2	5.2	5.2	5.2	71	71	71
Spotfin shiner	1	2.3	1.9	1.9	1.9	1.9	62	62	62
Yellow bullhead	5	11.4	49.9	10.0	2.3	34.8	82	58	143
Total	44	100.0	700.5						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-3

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT DEVON AVENUE ON SALT CREEK, SEPTEMBER 21, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Blackstripe topminnow	7	30.4	8.9	1.3	0.2	3.8	47	30	73
Bluegill	6	26.1	11.5	1.9	1.4	2.7	49	44	58
Bluntnose minnow	1	4.3	0.6	0.6	0.6	0.6	46	46	46
Green sunfish	2	8.7	16.1	8.1	6.9	9.2	80	79	80
Largemouth bass	1	4.3	5.7	5.7	5.7	5.7	78	78	78
Orangespotted sunfish	3	13.0	17.3	5.8	5.5	6.0	72	71	73
Pumpkinseed	1	4.3	2.7	2.7	2.7	2.7	52	52	52
Pumpkinseed x bluegill	1	4.3	1.3	1.3	1.3	1.3	44	44	44
Spotfin shiner	1	4.3	0.6	0.6	0.6	0.6	42	42	42
Total	23	100.0	64.7						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-4

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT WOLF ROAD ON SALT CREEK, SEPTEMBER 17, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Bluegill	16	30.8	520.5	32.5	0.8	90.0	104	34	158
Bluntnose minnow	15	28.8	19.1	1.3	0.4	6.2	46	33	81
Creek chub	2	3.8	133.6	66.8	43.7	89.9	177	160	194
Green sunfish	6	11.5	64.9	10.8	1.2	27.5	72	38	116
Largemouth bass	1	1.9	16.4	16.4	16.4	16.4	110	110	110
Pumpkinseed	2	3.8	3.6	1.8	1.8	1.8	46	46	46
Spotfin shiner	4	7.7	25.2	6.3	3.6	7.3	82	67	87
White sucker	2	3.8	395.3	197.6	55.3	340.0	238	162	314
Yellow bullhead	4	7.7	11.2	2.8	1.6	3.6	54	46	60
Total	52	100.0	1189.6						

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE AIV-5

RELATIVE ABUNDANCE, SPECIES COMPOSITION, WEIGHT, AND LENGTH OF FISH COLLECTED AT FIRST AVENUE ON SALT CREEK, SEPTEMBER 16, 1999

Fish Species	Relative Abundance (number)	Species Composition (percent)	Collection Weight (grams)	Body Weight (grams)			Total Length (mm)		
				Mean	Minimum	Maximum	Mean	Minimum	Maximum
Blackside darter	1	1.1	3.0	3.0	3.0	3.0	65	65	65
Bluegill	5	5.6	11.0	2.2	1.2	3.9	52	45	62
Bluntnose minnow	19	21.1	24.3	1.3	0.2	5.4	47	26	78
Creek chub	1	1.1	2.0	2.0	2.0	2.0	56	56	56
Green sunfish	6	6.7	16.9	2.8	0.9	5.3	53	38	66
Largemouth bass	1	1.1	37.4	37.4	37.4	37.4	142	142	142
Sand shiner	7	7.8	7.6	1.1	0.6	1.8	48	40	55
Spotfin shiner	50	55.6	128.9	2.6	0.3	10.1	60	31	95
Total	90	100.0	231.1						