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# MINNESOTA DEPARTMENT OF NATURAL RESOURCES DIVISION OF FISH AND WILDLIFE ENVIRONMENT SECTION

# 1974 Progress Report on the Prairie Island Fish Population Study

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Environmental and Governmental Activities Department Northern States Power Company

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ву:

Robin L. Naplin and Joseph L. Geis Aquatic Biologists

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## TABLE OF CONTENTS

	Page
Introduction	573
Scope	573
Study	5 <b>73</b>
General	5 <b>73</b>
Study Area	574
Methods	574
Gear	574
Trap Netting	581
Electro-Fishing	581
Gill Netting	582
Trawling	582
Seining	582
Tagging	583
Scale Samples	583
Ancillary Studies	584
Results and Discussion	585
Trap Netting	585
Electro-Fishing	586
Gill Netting	589
Trawling	590
Seining	591
Analytical Methods-Abundance Index	596
Tagging Study	598

TABLE OF CONTENTS (Continued)

	Page
Scale Samples	607
Analytical Methods - FORTRAN SHAD	607
Length-Frequency Distribution	609
Condition Factor	609
Length-Weight Relationship	609
Body-Scale Relationship	616
Ancillary Studies	616
Temperature Study	616
Intake Bubbler Study	638
Larval Towing	641
Summary of Conclusions	648
Conditions and Observations to be Investigated	652
Literature Cited	653
Appendix A	659
Appendix B	661
Appendix C	675
Appendix D	696
Appendix E	704
Appendix F	711
Appendix G	713

# LIST OF FIGURES

Figure	1		Fish Population Study Sections used in the Vicinity of the Prairie Island Generating	
			Plant	575
Figure	2		Diagram of a River Trap Net Set	576
Figure	3		Diagram of Electro-fishing Apparatus	577
Figure	4	-	Diagram of an Experimental Gill Net Set	578
Figure	5	-	Diagram of Trawl in Operation	579
Figure	6	-	Diagram of a Bag Seine in Operation	580
Figure	7	-	Length-Weight Relationship of Grouped Means for Walleye, 1973	617
Figure	8		Length-Weight Relationship of Grouped Means for Sauger, 1973	618
Figure	9	-	Length-Weight Relationship of Grouped Means for White Bass, 1973	619
Figure	10	-	Length-Weight Relationship of Grouped Means for Smallmouth Bass, 1973	620
Figure	11	-	Length-Weight Relationship of Grouped Means for Freshwater Drum, 1973	621
Figure	12	-	Length-Weight Relationship of Grouped Means for Northern Pike, 1973	622
Figure	13	-	Length-Weight Relationship of Grouped Means for Channel Catfish, 1973	623
Figure	14		Length-Weight Relationship of Grouped Means for Black Crappie, 1973	624
Figure	15		Length-Weight Relationship of Grouped Means for Bluegill, 1973	625
Figure	16		Length-Weight Relationship of Grouped Means for Rock Bass, 1973	626
Figure	17		Length-Weight Relationship of Grouped Means for Carp, 1973	627

# LIST OF FIGURES (Continued)

				Page
Figure	18	-	Length-Weight Relationship of Grouped Means for Shorthead Redhorse, 1973	628
Figure	19	-	Length-Weight Relationship of Grouped Means for Gizzard Shad, 1973	629
Figure	20	-	Percent Deviations from Average Growth for Five Species: Walleye, Sauger, White Bass, Smallmouth Bass, and Freshwater Drum at Prairie Island, 1973	636
Figure	21		Temperatures taken at Sturgeon Lake, Station 1-4 for the Months of April - June (Midnight Readings), 1974	637
Figure	22	-	Diagram of Larval Fish Tows at Prairie Island, 1974	642
Figure	23	-	Mean Number of Larval Fish per 50 Meter Tow from Stations 1, 2, and 3	644
Figure	24	-	Mean Tow Net Catches at Station No. 3 During Successive Periods, May - August, 1974	646
Figure	25		Tow Net Catches at Station No. 3 vs. Wind Direction May 24 - August 12, 1974	650

## LIST OF TABLES

				raye
Table	1	-	Shoreline Seining Catches by Area for 1974	592
Table	2		Shoreline Seining Catches for 1973 and 1974	594
Table	3	-	Total Fish Tagged and Returned, 1974	600
Table	4	-	Movement and Rate of Travel of Tagged Saugers, 1974	602
Table	5	-	Movement and Rate of Travel of Tagged White Bass, 1974	603
Table	6	_	Movement and Rate of Travel of Tagged Walleyes, 1974	605
Table	7	-	Movement and Rate of Travel of Tagged Northern Pike, 1974	606
Table	8	-	Length-Frequency Distribution of Walleye, 1973.	610
Table	9	<del></del>	Length-Frequency Distribution of Sauger, 1973	610
Table	10		Length-Frequency Distribution of White Bass, 1973	611
Table	11	-	Length-Frequency Distribution of Smallmouth Bass, 1973	611
Table	12	-	Length-Frequency Distribution of Drum, 1973	612
Table	13	-	Length-Frequency Distribution of Northern Pike, 1973	612
Table	14	-	Length-Frequency Distribution of Channel Catfish, 1973	613
Table	15	-	Length-Frequency Distribution of Black Crappie, 1973	613
Table	16	-	Length-Frequency Distribution of Bluegill, 1973	613
Table	17	-	Length-Frequency Distribution of Rock Bass,1973	614
Table	18	-	Length-Frequency Distribution of Carp, 1973	614
Table	19	-	Length-Frequency Distribution of Shorthead Redhorse, 1973	615
Table	20	-	Length-Frequency Distribution of Gizzard Shad, 1973	615
Table	21	-	Estimated Body Length at Annulus Formation of Walleye, 1973	630

# LIST OF TABLES (Continued)

				Page
Table	22	-	Increments of Growth of Walleye, 1973	630
Table	23	-	Estimated Body Length at Annulus Formation of Sauger, 1973	631
Table	24	-	Increments of Growth of Sauger	631
Table	25	-	Estimated Body Length at Annulus Formation of White Bass, 1973	<b>63</b> 2
Table	26	_	Increments of Growth of White Bass, 1973	632
Table	27	-	Estimated Body Length at Annulus Formation of Smallmouth Bass, 1973	633
Table	28		Increments of Growth of Smallmouth Bass, 1973	633
Table	29	-	Estimated Body Length at Annulus Formation of Drum, 1973	634
Table	30	-	Increments of Growth of Drum, 1973	634
Table	31		Percentage Deviations of Gr <b>o</b> wth from 1965-1972 Average for Five Species of Fish in the Prairie Island Area	635
Table	32		Summary of Electro-Fishing Catch for Intake Bubbler Study, August 12-16, 1974	639
Table	33		Electro-Fishing Daily Catches of Most Abundant Species for Intake Bubbler Study, August 12-16, 1974	640
Table	34		Summary of Larval Towing for 1974	643
Table	35	-	Wind Direction and Velocity and Means of Catches for Tow Nos. 1, 2, and 3 (For 24 Hours Preceding Each Sampling Date)	647
Table	36	-	Wind Directions and Larval Fish Catches for Tow No. 3, May 24 - August 19, 1974	649

# APPENDIX A

A List	of	Common	an	nd So	cientific	Names	and	Methods of	
Capture	of	Fish	in	the	Prairie	Island	Area	, 1974	659

# APPENDIX B

Summary of Trap Netting in the Prairie Island Vicinity,	661
Summary of Trap Net Catches by Area, Spring	661
Summary of Trap Net Catches by Area, Summer	662
Summary of Trap Net Catches by Area, Fall	66 <b>3</b>
Length-Frequency of Fishes Caught in Trap Nets, Spring	664
Length-Frequency of Fishes Caught in Trap Nets, Summer	667
Length-Frequency of Fishes Caught in Trap Nets, Fall	671

# APPENDIX C

Summary of Electro-Fishing in the Prairie Island Vicinity,	
1974	575
Summary of Day Electro-Fishing Catches by Area, Spring $\epsilon$	575
Summary of Day Electro-Fishing Catches by Area, Summer $ extsf{e}$	576
Summary of Day Electro-Fishing Catches by Area, Fall	577
Day Electro-Fishing Catches from Selected Stations by Area, Fall	578
Night Electro-Fishing Catches from Selected Stations by Area, Fall	5 <b>79</b>
Length-Frequency of Fishes Caught by Day Electro- Fishing, Spring	580
Length-Frequency of Fishes Caught by Day Electro- Fishing, Summer	584
Length-Frequency of Fishes Caught by Day Electro- Fishing, Fall	688

# APPENDIX C (Continued)

	Page
Length-Frequency of Fishes Caught by Night Electro- Fishing, Fall	692
APPENDIX D	
Summary of Gill Netting in the Prairie Island Vicinity, 1974	696
Summary of Gill Net Catches by Area and Season	696
Length-Frequency of Fishes Caught in Gill Nets, Spring	697
Length-Frequency of Fishes Caught in Gill Nets, Fall	700
APPENDIX E	
Commence of Musculing in the Dupinie Televel Minister 1074	702

Summary of Trawling in the Prairie Island Vicinity, 1974	703
Summary of Trawl Catches by Area and Season	703
Length-Frequency of Fishes Caught by Trawling, Spring	704
Length-Frequency of Fishes Caught by Trawling, Summer	706
Length-Frequency of Fishes Caught by Trawling, Fall	708

## APPENDIX F

Length-F	requency	of of	Fishes	Used	for	Scale	Samples	in	the	
Prairie	Island V	7icir	nity, l	974						711

## APPENDIX G

## INTRODUCTION

This study is part of a continuing comprehensive investigation being carried out by various consultants to determine environmental effects of the Prairie Island Nuclear Generating Plant near Red Wing, Minnesota. The purpose of this study is to determine the effects of the plant on fish populations in the Mississippi River and its backwaters near Red Wing, Minnesota.

## Scope

The total study includes a fish population study and a creel survey. This report deals only with the fish population and includes 1973 laboratory work, 1974 field work, and data analysis for both years. The creel survey will be covered in a separate report.

### STUDY

## General

The 1974 field work was carried out in the same manner as in 1973. Sampling stations are described in the 1973 Progress Report. A tagging study was initiated this year to determine fish movements. Fish from previous tagging studies (Krosch, 1969 and Finke, 1964) show movement throughout the area from Taylors Falls, Minnesota to Lansing, Iowa. Additional tagging should give a better understanding of these movements in the area and help determine if there is one interbreeding mobile population, as speculated in the 1973 Progress Report. This was the first year when sampling was done during three separate seasons from June 1 to October 31, 1974, inclusive. June was considered the spring season. The summer season was the period from July 1 through August 31, 1974. The remaining period from September 1, to October 31, 1974, was considered the fall season.

## Study Area

Areas sampled were the same as described in 1973 and are shown in Figure 1. Each area or section consists of 10 numbered stations beginning with zero at the upstream end of the section and ending with nine at the downstream station in each section. In 1974, more extensive sampling was done than in 1973. More extensive electro-fishing was done in all areas. Two trawling stations were established in North Lake, in addition to those established in 1973. More trap netting was done in the immediate plant area and tailwaters. More gill net sets were made in Sections 0, 1, and 3. Seining was more extensive above and in the immediate plant area.

## METHODS

## Gear

Fish were collected using five kinds of sampling gear: trap net, electro-fisher (boom-shocker), gill net, trawl, and seine in order to monitor the abundance, condition, growth, and age of fish in the vicinity of the Prairie Island Plant. This gear is illustrated in Figures 2-6. A list of the common and scientific names and methods of capture of fish in the Prairie Island area, 1974 is shown in Appendix A.





# FIGURE 2. DIAGRAM OF A TRAP NET SET.



# FIGURE 3. DIAGRAM OF ELECTRO-FISHING APPARATUS









FIGURE 5. DIAGRAM OF TRAWL IN OPERATION.





The trap net and electro-fisher were the most productive gear used. The majority of fish tagged were obtained by electrofishing.

## <u>Trap netting</u>

Trap nets were set at ten stations in each of the sections except Section 2. No trap nets were set in Section 2 because of swift current and frequent barge traffic. Trap nets set in the main channel in Sections 3 and 4 were rolled frequently by the current. This problem was solved by attaching a 10-pound anchor to the center bottom of the front frame, which greatly reduced incidences of net-rolling.

Trap nets were also used in April and May to collect fish for tagging (approximately 550 fish were tagged). All fish netted were measured (total length). Scale samples were collected and individual lengths and weights measurements were recorded during all seasons from the following species: walleye, sauger, white bass, drum, shorthead redhorse, smallmouth bass, gizzard shad, largemouth bass, white crappie, black crappie, and bluegill.

Calculations of catch-per-unit-of-effort were based on a nominal 24-hour set.

## Electro-fishing

The electro-fisher is the same one utilized last year, except that 16-foot instead of 10-foot booms were used. In addition, eight-foot electrodes were also used (see Figure 3). Electrical output was regulated by adjusting engine r.p.m. An output range from 5.5 to 7.0 amperes was found to be most productive and was used for all shocking. At various periods during the 1974 sampling season, night shocking was conducted to compare catch with normal-day shocking. Data were collected during ten hours of active shocking. Catches are expressed as catch-per-hour of shocking.

## Gill netting

Gill netting was carried out in the more calm areas with ten sets in North Lake, ten sets in Sturgeon Lake, and five sets in the immediate plant area.

Nets used were standard 250 x 6-foot experimental gill nets (see Figure 4). Calculations are based on nominal 24-hour set.

## Trawling

Trawling was done in the plant intake and discharge as in 1973. In addition, trawling was done in two stations in North Lake that were relatively free of obstructions. Trawl catches are expressed as catch-per-hour of trawling.

## <u>Seining</u>

Shoreline seining was restricted to areas with water depths of less than six feet. The seine used in 1974 was 1/4 inch knotless nylon, 50 feet long and four feet deep with a 4 x 4 x 4foot bag. This smaller seine was used because most areas seined were too small to effectively operate the 100 x 8-foot seine used in the 1973 sampling. Each haul in 1974 covered approximately 300 square meters. A total of 0.81 hectares were seined above and in the immediate plant area in 1974, as compared with 0.48 hectares in 1973. Species composition and species diversity of seine catches in 1973 and 1974 were compared.

## **Tagging**

A fish tagging program was initiated in April, 1974. Fish were tagged with a tag consisting of a length of yellow vinyl tubing of approximately 1/16-inch diameter with a molded "T" shaped nylon anchor attached to one end. Tags are imprinted with the legend, MINN DNR ST PAUL F\_\_\_\_\_ and serially numbered. Tags are applied to fish with a special gun. A slotted hypodermic needle is inserted into the fish, and the crossbar of the anchor is forced through the needle by a plunger. During application, the upright portion of the anchor protrudes through a longitudinal slot in the needle and bends back parallel to the The qun is then rotated approximately 180° to crossbar. disengage the crossbar from the needle, and the needle is withdrawn, leaving the tag imbedded in the musculature of the fish. A slight pull on the tag causes the crossbar to return to a position perpendicualr to the upright, thus anchoring the tag (Krosch, 1968). This tagging method was used because a minimum of handling is needed to attach a tag, which reduces stress on the fish.

A total of 1,715 fish were tagged in 1974. Species tagged were walleye, sauger, white bass, northern pike, smallmouth bass, largemouth bass, channel catfish, and flathead catfish.

## Scale samples

Scale aging methods were described in the 1973 progress report. Age and growth data from scales collected in 1973 were analyzed using the Iowa FORTRAN SHAD program (Mayhew, 1973). Calculations made by this program are described below in the methods for the shad program. In 1974, 4,334 scale samples were taken from 12 species (walleye, sauger, white bass, smallmouth bass, drum, shorthead redhorse, gizzard shad, black crappie, white crappie, bluegill, and largemouth bass). The 1974 scale samples have been aged twice independently and the analysis of these data will be presented in the 1975 progress report.

## Ancillary studies

Temperatures for Sturgeon Lake were recorded with a Tempscribe recording thermograph placed at Section 1, Station 4. This location had a coarse, gravel-rubble bottom and was thought to be a potential walleye and sauger spawning area. The temperature sensor was placed approximately one foot from the bottom approximately 15 feet offshore. All temperatures reported were for midnight.

A one-week study was conducted from August 12, 1974, through August 16, 1974, to help evaluate the effectiveness the intake bubbler has in keeping fish away from the immediate intake area. Each day for five consecutive days, electro-fishing was done for 30 minutes between the intake bubbler and the skimmer wall. Fish captured were released outside the bubbler at some distance away from the immediate area. Catch is expressed as number of fish per hour, the same as the other electro-fishing data.

Larval fish were sampled on 24 days between May 8, 1974 and August 26, 1974. One tow was made at each location shown in Figure 22. Tows were made with a net with one square meter frontal area and a mesh size of 787 microns. Contents of the net were removed at the end of each run in the same manner as done when sampling plankton. A concentrating cup was used to reduce the amount of water in the sample. Samples were preserved

with ten percent formalin solution and counted at a later date.

## RESULTS AND DISCUSSION

## Trap netting

The summary of trap net catches and length frequencies of fish trap netted are shown in Appendix B.

white bass comprised slightly more than one-fourth of all fish caught. Catches of white bass in 1974 were highest in the spring (10.85 per lift) and fall (15.75 per lift) above the plant area. Average catch of white bass during summer and fall in trap nets was 7.09 fish per lift in 1974 as compared to 3.30 fish per lift in 1973 (Hawkinson, 1974). White bass catches for spring, 1974 for all areas were two to ten times greater than catches on the St Croix from 1966-1970 (Krosch, 1971). Sauger and walleye comprised only about four percent of trap net catches in 1974. The 1974 catch of walleye ranged from 0 to 0.55 fish per lift. This is very similar to catches in 1973 (Hawkinson, 1974). The highest catches (0.40 to 0.55 fish per lift) occurred, as in 1973, in North and Sturgeon Lakes. Sauger catches in 1974 were similar to 1973 catches. The average catch for summer and fall was 1.76 fish per lift in 1973 and 1.60 fish per lift in 1974. Over 21 percent of the trap net catch in 1974 was carp. Fall catches of carp were lower than spring and This reduction in catch was most noticeable summer catches. above the plant and below Lock and Dam 3. Average catches of carp for summer and fall of 1974 were higher (5.95 fish per lift) than in 1973 (3.74 fish per lift).

Catches of freshwater drum in all areas varied throughout the 1974 sampling season. The highest catch of drum (14.80 fish per lift) occurred below Lock and Dam 3 in the spring season. The average catch of freshwater drum for summer and fall of 1974 (4.05 fish per lift) was higher than in 1973 (2.89 fish per lift) (Hawkinson, 1974).

White bass, carp, and drum comprised about 64 percent of all fish caught in all areas for the entire sampling season. Almost six percent (5.8) of the total fish caught in all areas were black crappie.

## Electro-fishing

Electro-fishing results are summarized in Appendix C. Gizzard shad comprised about 23 percent of the total fish shocked for 1974. The total catch of shad was made up from summer and fall catches, as only one shad was caught in the spring season. Summer and fall catches of shad for the plant area were 60.80 and 152.20 fish per hour, respectively. These high catches are mostly made up of young-of-the year (Y/Y)shad.

Bluegill comprised almost 20 percent of total fish shocked. Catches of bluegill were low above the plant in all seasons, and were low in all areas during spring. Summer and fall catches were 80.80 - 110.20 fish per hour below Lock and Dam 3. The highest catch of bluegill (152.20 fish per hour) occurred in the plant area in the fall. Most of the bluegill caught electrofishing in the plant area were found in areas that were recently riprapped.

Carp comprised 17.4 percent of fish shocked in 1974. The catch of carp steadily dropped from spring to fall in the plant area and above. The highest catch of carp (72.40 fish per hour) occurred below Lock and Dam 3 in the fall.

White bass catches in 1974 were similar to those in 1973. The highest catches occurred in Section 4 (44.80 fish per hour) and in the plant area(38.40 fish per hour) during the summer.

Sauger catches during summer and fall of 1974 (3.68 fish per hour) were lower than 1973 catches (7.86 fish per hour). The fall catch of sauger from tailwaters of Lock and Dam 3 in 1974 (3.20 fish per hour) was very low compared to 1973 (27.33 fish per hour).

Walleye catches were about the same in the spring (6.80 fish per hour) and fall (6.00 fish per hour) seasons but only about half as high in the summer (3.60 fish per hour) below Lock and Dam 3. The 1974 average total summer and fall walleye catch (1.88 fish per hour) is higher than the 1.29 fish per hour average in 1973. The 1974 catch was lower than 1973 above and in the plant area, but a total of 41 fish were taken below Lock and Dam 3 in 1974 to raise the average total catch of walleye (Hawkinson, 1974).

Night electro-fishing was done in October to compare with the normal day shocking. Five stations were chosen in each of Sections 0, 1, 3, and 4. All of Section 2 (ten stations) was shocked at night because of very low catches during day shocking. The data obtained during night shocking were compared to day shocking data from the same stations (Appendix C). Shad catches for night shocking were comparatively much lower than day catches. Carp catches were higher for night shocking in the plant area but less than half the day catch below Lock and Dam 3. Day and night catch of carp above Lock and Dam 3 were very similar (Appendix C).

Walleye, sauger, and white bass night catches are considerably higher than day catches. Walleye night catches were 250 to 300 percent higher than day catches. Sauger night catches were from 250 to 1,325 percent that of day catches. White bass night catches were from 275 to 1,335 percent of the respective day catches.

Bluegill night catches were 32 and 17 percent lower than day catches in the plant area and below Lock and Dam 3, respectively. The day catches of bluegill were 136.80 fish per hour in the plant area and 110.00 fish per hour below Lock and Dam 3. Many of the bluegills shocked did not float to the surface until the shocking boat had passed. It is much harder to see these fish at night when they do come to the surface behind the boat.

Smallmouth bass night catches (2.40 fish per hour) were 50 percent lower than day catches (4.80 fish per hour) in the plant area. Only three smallmouth bass were caught night shocking above the plant compared to 34 during day shocking. No smallmouth bass were caught night shocking below Lock and Dam 3.

In general, night electro-fishing catches for walleye, sauger, and white bass were at least two times higher than day catches. This must be considered in future electro-fishing operations.

## <u>Gill netting</u>

Results of 1974 gill netting are shown in Appendix D. Walleye, sauger, channel catfish, and shad gill net catches in fall, 1974, decreased from 1973 catches. White bass, northern pike, black crappie, and carp catches in fall, 1974 increased from 1973 catches (Hawkinson, 1974). Fall walleye catches decreased from 2.37 fish per lift in 1973 to 1.56 fish per lift on 1974. Sauger catches decreased from 7.32 fish per lift in 1973 to 6.84 fish per lift in fall, 1974. Fall, 1974 channel catfish gill net catches (0.96 fish per lift) were 73 percent of 1973 catches (1.32 fish per lift). Fall shad catches in 1974 were 28.76 fish per lift for a decrease of 31 percent from 1973 catches (41.84 fish per lift). Fall white bass catches in 1974 (11.76 fish per lift) were higher than in 1973 (5.47 fish per lift). Fall northern pike catches in 1974 (0.92 fish per lift) were somewhat higher than 1973 catches (0.79 fish per lift). More black crappies were gill netted in fall, 1974, (1.36 fish per lift) than in 1973 (0.21 fish per lift). Fall, 1974 catches of carp (4.88 fish per lift) were about five times greater than 1973 catches (0.95 fish per lift).

Spring and fall, 1974 catches of northern pike were identical (0.92 fish per lift). Carp catches decreased somewhat from spring (5.96 fish per lift) to fall (4.88 fish per lift). Walleye catches were twice as high in fall (1.56 fish per lift) as in spring (0.76 fish per lift). Fall catches of sauger (6.84 fish per lift) increased from spring catches (4.20 fish per lift). The most significant differences in catches between spring and fall occurred for white bass. Fall catches of white bass (11.7 fish per lift) were almost five and one-half times higher than the spring catches (2.16 fish per lift).

## Trawling

The results of 1974 trawling are shown in Appendix E. Drum comprised 46 percent of all fish caught by trawling in 1974. Most of the drum were young-of-the-year (Y/Y). Gizzard shad were almost 18 percent of the total trawl catch. The third highest number of fish caught by trawling (196) were white crappie, which comprised 13 percent of the total catch.

Highest catches of drum, channel catfish, walleye and sauger, and white bass occurred in the spring and summer sampling seasons. High numbers of shad (114), white bass (55), and white crappie (66) caused the 1974 catch per hour for North Lake to be very high for summer.

## Seining

Results of 1974 shoreline seining by areas are shown in Table 1. A comparison of seine catches between 1973 and 1974 is shown in Table 2. The total number of fish caught in shoreline seining in 1973 was 4,105 and 2,105 in 1974 (Table 2). The number of species seined both years was 35. Catches for both years were compared by use of a diversity index. Diversity indices are additional tools for measuring the quality of the environment and the effect of induced stress on the structure of a community. Their use is based on the generally observed phenomenon that relatively undisturbed environments support communities having large numbers of species with no individual species present in overwhelming abundance. A low index (less than 1.0) will show dominance (90 percent or more) by one or two species, and a high index (greater than 3.5) indicates a diverse population with one or two species comprising less than 47 percent of the total catch. Values for most rivers in Minnesota range from 2.0 to 3.0 for the diversity index (Peterson, personal communication).

The two components of species diversity are: a) richness of species, and b) distribution of individuals among the species. The formula used for calculating the mean diversity  $(\overline{d})$  is:

 $\bar{d} = \frac{c}{N} (N \log_{10} N - \sum n_i \log_{10} n_i)$ 

where C = 3.321928 (converts base 10 logs to base 2 logs); N = total number of individuals; and ni = total number of individuals in the  $i\frac{th}{t}$  species (Weber, 1973). The calculated mean diversity ( $\overline{d}$ ) for 1973 was 2.32 and for 1974, 3.47. Both these values indicate a diverse population, not being dominated by one or two species. The lower diversity index for 1973 is a result of large numbers of Y/Y white bass (1,523) and Y/Y gizzard shad (1,729) in the catch. These two species had a very strong year class in 1973 as compared to 1974 (Table 2). Shiners and minnows (11 species) comprised over 53 percent of the total 1974 seine catch.

							Tailwat	ers of	Total	
	Above Plant		Plant		Area		Lock and Dam 3			
	No. of	%		No. of	%		No. of	%	No. of	%
Species	Fish	Total		Fish	Total		Fish	Total	Fish	Total
Shortnose gar	-	-		3	1.2		1	0.1	4	0.2
Gizzard shad (YY)	162	15.8		17	7.0		150	18.0	329	15.6
Gizzard shad (Other)	2	0.2		-	_		-	-	2	0.1
Bigmouth buffalo				-	-	1.2	1	0.1	1	0.1
Smallmouth buffalo	l	0.1		2	0.8		-	···	3	0.1
Carpsucker (YY)	3	0.3		6	2.5		-	-	9	0.4
Carpsucker (Other)	11	1.1		5	2.1		2	0.2	18	0.9
Shorthead redhorse	4	0.4		1	0.4		· 2 ·	0.2	7	0.3
Carp (YY)		· •		-	, <b>-</b>	•	2	0.2	2	0.1
Carp (Other)	4	0.4		2	0.8		- 4	0.5	10	0.5
Silver chub	100	9.7		17	7.0		40	4.8	157	7.5
Notropis species	479	46.6		56	23.0		499	59.8	1034	49.2
Common shiner	8	0.8		1	0.4		_	_	9	0.4
Emerald shiner	181	17.6	-	15	6.2		264	31.6	460	21.9
Roseyface shiner	85	8.3	× .	5	2.1		172	20.6	262	12.5
Spotfin shiner	26	2.5		3	1.2		-	<b>_</b>	29	1.4
River shiner	2	0.2		-	· `		-		2	0.1
Spottail shiner	171	16.6		30	12.3		63	7.6	264	12.5
Mimic shiner	-	-	· .	1	0.4		-	-	1	0.1
Blacknose shiner	6	0.6		1	0.4	din e			7	0.3
Other minnows	32	3.1		47	19.3		7	0.8	86	4.1
Brassy minnow	-	· _			-		1	0.1	1	0.1
Bullhead minnow	25	2.4	÷ 4	28	11.5		6	0.7	59	2.8
Bluntnose minnow	7	0.7		19	7.8		_	-	26	1.2
Channel catfish	8	0.8		1	0.4	· · · ·	-	-	9	0.4
Yellow bullhead	_		÷	î <b>–</b> -			1	0.1	í	0.1
Northern pike	1	0.1		<b>-</b> .	-		1	0.1	2	0.1
Trout perch	1	0.1			-	-	_		ī	0.1
White bass (YY)	137	13.3		24	9.9		69	8.3	230	10.9
White bass (other)	9	0.9	· .	12	4.9		5	0.6	26	1.2

# Table 1 - Shoreline seining catches by area for 1974

				Tailwaters of								
	Above Plant		Plant Area		Lock and Dam 3		Total					
	No. of	%	No. of	%	No. of	%	No. of	%				
Species	Fish	Total	Fish	Total	Fish	Total	Fish	Total				
Yellow perch	3	0.3	-	-	1	0.1	4	0.2				
Sauger (YY)	7	0.7	2	0.8	-	-	· 9	0.4				
Sauger (Other)	2	0.2	2	0.8	4	0.5	8	0.4				
Log perch	3	0.3	4	1.7	7	0.8	14	0.7				
Johnny darter	2	0.2	5	2.1	1	0.1	· · 8 ····	0.4				
Smallmouth bass	3	0.3	-	<b>_</b>	-	-	3	0.1				
Green sunfish	-	-	4	1.7	-	-	4	0.2				
Bluegill (YY)	10	1.0	9	3.7	-		19	0.9				
Bluegill (Other)	-	-	1	0.4	6	0.7	7	0.3				
Rock bass	1	0.1	2	0.8	-	-	3	0.1				
White crappie (YY)	5	0.5	1	0.4	3	0.4	9	0.4				
White crappie (Other)	1	0.1	2	0.8	3	0.4	6	0.3				
Black crappie (YY)	14	1.4	4	1.7	12	1.4	30	1.4				
Black crappie (Other)	1	0.1	3	1.2	3	0.4	7	0.3				
Drum (YY)	19	1.9	11	4.5	. 9	1.1	39	1.9				
Drum (Other)	2	0.2	, <b>-</b>	-	2	0.3	- 4	0.2				
Total	10 <b>27</b>		243		835		2105					

# Table 1 - Shoreline seining catches by area for 1974 (Cont.)

	19	973		1974		
	No. of	%		No. of	&	
<b>Species</b>	Fish	Total	a and a state of the	Fish	Total	
Ob a subscience of the second		ma		<b>h</b> .	0.20	
Snorthose gar	2			4	0.20	
Mooneye	2	Tr		7.00	15 (0	
Gizzard shad (II)	1729	42.10		329	15.60	
Gizzard shad (Other)	_			2	0.10	
Bigmouth buffalo	1	Tr*		1	0.10	
Smallmouth buffalo	3	0.10		3	0.10	
Carpsucker (YY)	98	2.40		9	0.40	
Carpsucker (Other)				18	0.90	
Silver redhorse	5	0.10				
Shorthead redhorse	7	0,20		7	0.30	
Carp (YY)	4	0.10		2	0.10	
Carp (Other)	1	$\mathbf{Tr}^*$	· ·	10	0.50	
Silver chub	30	0.70	,	157	7.50	
Notropis app.	336	8.20		1034	49.20	
Common shiner				9	0.40	
Emerold shiner	171	4,20		460	21.90	
Docufoco chinor	79	1.90		262	12.50	
Snotfin shinen	1	ጥ <sub>ዀ</sub> ቅ		20	1 40	
Diver chinen	z	ົ້າດ		->	0.10	
arvel Surrel	82	2 00		264	12 50	
Spottall Sainer	02	2.00		204	0.10	
Mimic Sniner	•				0.10	
blacknose sniner	70	0.00		86	4 10	
Other minnows	27	0.90		00	<b>4°T</b> O	
Hornyhead chub	15	0.40		-	0.10	
Brassy minnow	<b>i</b> .	0.70		T.	0.10	
Silvery minnow	4	0.10	· .	. 50	a 9a	
Bullhead minnow	7	0.20		59	2.80	
Bluntnose minnow	11	0.30		26	1.20	
Channel catfish				9	0.40	
Yellow bullhead				1	0.10	
Tadpole madtom	4	0,10				
Northern pike	2	Tr*	1	2	0.10	
Trout perch	53	1.30		1	0.10	
White bass (YY)	1523	37.10		230	10.90	
White bass (Other)				26	1.20	
Yellow perch	28	0.70		4	0.20	
Sauger (YY)	26	0.60		9	0.40	
Sauger (Other)				8	0.40	
Walleve	1	$Tr^*$		_		
Walleve & Sauger	22	0,50				
Log nerch	47	1.10		14	0.70	
Johnny derter	', 1	ሞምቋ		Ŕ	0.40	
Smallmanth hage	2	ሞም		7	0.10	
Amaan cunfich Amaan cunfich	<u>ר</u> ז	፝ ፝ዀ፝፝፝፝፝፝		Ĺ	0.20	
BINGWIJJ (AA) Algen onniton	זר	0 Z0		10	0 00	
Dineatly (VtPa-) Dineatly (V1)	ار طر				0.30	
Dragitt (Aruel)	<u> </u>	0 10		( 7		
ROCK DABS		0.10		2	0.10	
wnite crappie (II)	TO TO	0.20		· 9	0.40	
white crappie (Other)				6	0.30	
	19	73	1974			
---	----------------	------------	--------------------------	--	--	
Species	No. of Fish	& Total	No. of % Fish Total			
Black crappie (YY) Black crappie (Other)	12	0.30	30 1.40 7 0.30			
Drum (YY) Drum (Other)	100	2.40	<b>39</b> 1.90 4 0.20			
Total	4105	99.60	2105 100.00			

Table 2 - Shoreline seining catches for 1973 and 1974 (Cont.)

Tr = Trace < 0.10%

The 1974 catch shows a greater richness of species and a greater distribution of individuals among the different species than in 1973.

### Analytical Methods - Abundance Index

Analyzing data collected from all types of gear presents problems. A discussion of these problems and a possible solution to them is presented below.

- (1) Within limits, catch is proportional to effort.
- (2) Also, within limits, catch/unit of effort is proportional to population.
- (3) Each type of sampling gear has a certain efficiency for the various species of fish.
- (4) Corollary to (3), each species of fish has a different vulnerability to each type of gear.
- (5) There are seasonal variations of fish activity and behavior that affect (2), (3), and (4).

Hile (1962) devised a method of handling commercial fishery data from the Great Lakes in which catches from each type of gear, change in the amount of effort of each type of gear, and other factors were used to calculate an "Abundance Index", which was intended to indicate (among other things) the abundance of each species each year in comparison to their abundance during a base period.

The procedure used is as follows: The catch per unit of effort (CPE) was determined for each type of gear during a base period. For year "n", an expected catch (E) is calculated by multiplying the actual amount of effort expended during that year for each type of gear by the base period CPE of that gear. The expected catch is, therefore, the catch that would have been made if the CPE had remained the same as during the base period. Expected catches from each type of gear are added to determine the total expected catch. The Abundance Index (Ab) is then determined by dividing the total observed catch (that was actually made) by the total expected catch. Data are collected and analyzed separately for each species of fish in the catch and for each of several statistical districts. The Abundance Index is thus automatically weighted for changing amounts of effort and for differing efficiency of each gear.

As used for the Great Lakes commercial fishing data, this method has proven to have several serious shortcomings, which, I believe, do not effect its use for analyzing data from fish sampling. A "base period" should be a period when fish populations and fishing effort are fairly stable. In the case of at least some of the Great Lakes fishery data (Hile, 1962), fishing effort was increasing and populations were declining during the base period. It has been observed in many overexploited fisheries that as the fish population declines, the inefficient operators leave the fishery (thus reducing the amount of effort and the expected catch), while the remaining fishermen adopt more efficient methods of exploiting the remaining stock of fish (Hile, 1962). With this situation, the Abundance Index remains high or even increases, while the actual abundance of fish may be declining drastically. In many cases, the base period was prior to (and sometimes many years prior to) the study period, and hence the comparison with the base period was an extrapolation, which is riskier than interpolation.

Although this analysis has been questioned for commercial fishing data, it is felt that it has a great deal of value for analyzing sampling data from fish studies, such as the Prairie Island study. On this study, a station sampling method is used - i.e., the netting and other sampling is done at the same location each time. As much as possible, netting is done at the same time each year. Where there are two or more sampling periods with one sort of gear, each sampling period is considered separately. This procedure tends to eliminate the effects of location and season on the catch. Several sampling methods are used to ensure that each species is sampled efficiently by at least one gear.

It is believed that this sampling program eliminates the objections to Hile's Abundance mentioned previously. In the case of the present study, the base period is the entire length of the study and catch data from each year will be compared with the average of all years. Because sampling effort and locations are held constant, gear efficiency should not change.

There are some shortcomings to this method of analysis, but these are the same difficulties of small sample size and nonrandom distribution of fish that present problems with other analyses. Analysis of data from several sampling methods is difficult and can be described by the often used simile of "comparing apples and oranges."

If catch trends for the several sorts of gear were the same, no problem would exist, but this frequently is not the case. For example, spring trap net catches of a species may show a fairly consistent increase, summer trap net catches show an equally consistent decrease, gill net catches tend to remain the same, and electro-fishing catches increase for the first half of the period and then steadily decrease. The general trend of all these catches is very difficult to determine by the usual The Abundance Index calculation, however, will make methods. it relatively easy to determine what trend, if any, exists. Data from each sampling station are tabulated separately, and can be readily combined to determine catch trends for groups of stations. This method will be used in the future to compare catches.

#### Tagging Study

The Prairie Island tagging study was initiated on April 9, 1974. Between April 9 and May 17, 1974, 1,111 fish were tagged. An additional 604 fish were tagged between August 27 and October 16, 1974, for a season total of 1,715. About two-thirds of the fish tagged during each period were obtained by electrofishing, with the other one-third being captured with trap nets.

To date, 92 (5.4%) of 1,715 tags have been returned. Table 3 shows total tags returned for each species, percent tag return for each species, and percent of total returns comprised by each species. Krosch (1967) reported a 3.6 percent return rate from white bass from one and one-half years of tagging on Lake St. Croix. Finke (1964) reported a 4.9 percent return rate in one year from white bass tagged in the tailwaters of Lock and Dam 3. These return rates are comparable to the 3.3 percent rate of white bass in the present study. The return rates of 9.0 percent and 3.3 percent from saugers and walleyes, respectively, are lower than the 17.3 percent and 14.5 percent returns from saugers and walleyes, respectively, in one and one-half years of tagging in Lake St. Croix reported by Krosch (1967). Return rates in all studies represent minimum rather than absolute returns, because all of these studies relied on fishermen to voluntarily return the tags and all fishermen may not have reported tagged fish. Krosch worked out of a resort on the St. Croix that fishermen frequent. This helped publicize his study and could have enhanced tag returns.

The longest upstream movement in the Prairie Island study was 108.23 kilometers (km) (67.25 miles) by a white bass. The fish was tagged below Lock and Dam 3 on April 23, 1974, and was caught 82 days later (July 14, 1974) north of the Taylors Fall's Highway Bridge; an average movement of 1.32 km (0.82 miles) per day. The longest downstream movement, 136.31 km (84.7 miles), was made by a channel catfish tagged April 18, 1974, in Sturgeon Lake and caught 142 days later (September 7, 1974) below Lock and Dam 6 at Trempealeau, Wisconsin. This fish negotiated five dams in the process and traveled an average of 0.97 km (0.60 miles) per day. Finke (1964) reported tag returns ranging

Species	Tagged Above L&D 3	Tagged Below L&D 3	Total Tagged	Total Tag Returned	% Tag Return	% of Return
Walleye	<b>9</b> 0	120	210	7	3.3	7.6
Sauger	73	479	552	50	9.0	54.3
White bass	375	348	723	24	3.3	26.1
Northern pike	101	11	112	6	5.3	6.5
Channel catfish	44	13	57	2	3.5	2.2
Flathead catfish	6	1	7	Ο	0	0
Smallmouth bass	27	18	45	2	4.4	2.2
Largemouth bass	1	8	9 .	1	11.1	1.1
TOTAL	717	<b>99</b> 8	1715	92	5.4	100

Table 3 - Total fish tagged and returned, 1974

from the St. Croix River to Lansing, Iowa.

Sauger, white bass, walleye, and northern pike comprised 82 percent of the fish tagged, that is 1,408 of 1,715 tags. These same four species comprised 94.5 percent of the tag returns.

Table 4 summarizes data on the movement of sauger tagged in 1974. Of 49 saugers returned, 22 were caught downstream from the location where tagged, 18 were caught in the same general area as tagged, and 9 were caught upstream from the location tagged. The 31 sauger that moved an appreciable distance from the location tagged traveled an average of 35.97 km (22.35 miles). The range for individual fish was 12.47 km (7.75 miles) to 70.41 km (43.75 miles). Days to recapture average 54.4 days and ranged from 2 to 257 days. Fish that did not move from the tagging location had the shortest time to recapture with an average of 26.9 days. Fish that moved upstream averaged 50.6 days to recapture, and fish that moved downstream had the longest average time to recapture (78.5 days).

The 49 sauger moved an average of 0.42 km (0.26 miles) per day. Distance traveled ranged from zero for fish caught in the same general location tagged to 4.75 km (2.95 miles) per day for the fastest travelers. The 49 sauger displayed a net downstream movement of 11.88 km (7.38 miles) per fish.

Table 5 summarizes the movement of white bass tagged in 1974. Of the 24 white bass recaptured, 11 had moved downstream, and 6 showed no appreciable movement. The average distance traveled by white bass was considerably greater than for saugers; 51.10 km (31.75 miles) by white bass compared to 35.97 km (22.35 miles) by sauger.

The average time to recapture for white bass that moved downstream (92.27 days) was almost three times the average period to recapture for fish caught in the same general area as tagged or fish that had moved upstream; 33.67 and 32.29 days, respectively.

	Number of Fish <u>Tagg</u> ed	Number of Fish Recaptured	% Recaptured	Number of Fish Traveled	Average Distance Traveled (Range-km.)	<b>Avera</b> ge Days to Recapture (Range)	Average Distance Traveled Per Day (Range-km.)
TAGGED ABOVE L & D 3*	73	6	8.2	4	33.60 (16.50-59.14)	67.8 (16-162)	0 <b>.</b> 34 (0-0.92)
MOVEMENT: Upstream		2	2.7	2	17.51 (16.50-18.51)	104.5 (47-162)	0.16 (0.11-0.43)
Stationary		2	2.7		-	29 (16-42)	-
Downstream		2	2.7	2	49.70 (40.23-59.14)	70 (44 96)	0.71 (0.61-0.92)
TAGGED BELOW L & D 3	479	42	8.7	27	36.31 (12.47-70.41)	53.8 (2-257)	0.43 (0-4.75)
MOVEMENT: Upstream		7	1.4	7	33.17 (23.74-50.29)	35 <b>.</b> 1 (5 <del>.</del> 79)	0.95 (0.61-4.75)
Stationary		16	3.1	-	-	26.7 (2-178)	-
Downstream		20	4.1	20	37.50 (12.47-70.41)	79 <b>.</b> 4 (24-257)	0.47 (0.16-2.12)
TOTAL TAGGED	552	49 <b>+</b> 1**	9.0	31	35.97 (12.47-70.41)	54•4 (2-257)	0.42 (0-4.75)
MOVEMENT Upstream		9	1.6	9	29.68 (16.50-50.28)	50.6 (5-162)	0.58 (0.11-4.75)
Stationary		18	3.0	-	-	26.9 (2-178)	-
Downstream *Lock and Dam 3		22	3.9	22	38.61 (12.47-70.41)	78.5 (24-257)	0.50 (0.16-2.12)

\*\*1 Sauger, No Data

	Number of Fish Tagged	Number of Fish Recaptured	% Recaptured	Number of Fish Traveled	Average Distance Traveled (Range-km.)	Average Days to Recapture (Range)	Average Distance Traveled Per Day (Range-km.)
TAGGED ABOVE L & D 3*	375	4	1.1	4	44.51 (0.64-64.37)	60 (2 <b>-</b> 125)	0.74 (0.32-5.15)
MOVEMENT: Upstream		2	0.5	2	28.69 (0.64-56.73)	6.5 (2 <b>-</b> 11)	4.41 (0.32-5.15)
Downstream		2	0.5	2	60.35 (56.33-64.37)	113.5 (102-125)	0.53 (0.51-0.55)
TAGGED BELOW L & D 3	348	20	5.7	14	52.75 (23.74-108.23)	60.45 (3-144)	0.61 (0-6.49)
MOVEMENT .							· · · · · ·
Upstream		5	1.4	5	67.35 (23.74-108.23)	42.6 (8-82)	1.58 (0.32-6.29)
Stationary		6	1.7	-		34•67 (3-144)	-
Downstream		. 9	2.5	9	44.93 (28.57-68.80)	87.56 (40-136)	0.51 (0.27-1.17)
TOTAL TAGGED	723	24	3.3	18	51.06 (0.64-108.23)	60.38 (2-144)	0.63 (0-6.49)
MOVEMENT:							
Upstream		7	0.9	7	56.31 (0.64-108.23)	32.29 (2-82)	1.74 (0.32-6.49)
Stationary		6	0.8	-	-	34.67 (3-144)	• • • • • • • • • • • • • • • • • • •
Downstream		11	1.5	11	7.73 (28.57-68.80)	92.27 (40-136)	0.51 (0.27-1.17)

Table 5 - Movement and rate of travel of tagged white bass, 1974

\*Lock and Dam 3

White bass that moved upstream traveled the greatest average distance per day. White bass tagged above Lock and Dam 3 moved upstream 4.41 km (2.74 miles) per day. White bass tagged below Lock and Dam 3 moved upstream 1.58 km (0.98 miles) per day. Average distance travelled upstream by white bass tagged and recaptured was 1.74 km (1.08 miles) per day.

The 24 white bass displayed a net downstream movement of 5.46 km (3.39 miles) per fish. This is a little less than half the average net downstream movement by sauger; 11.88 km (7.38 miles) per fish.

Data on the movement of tagged walleye are summarized in Table 6. All walleyes returned had moved upstream or downstream from the location tagged.

Average distance traveled by all walleye was 43.68 km (27.14 miles) and ranged from 1.61 to 78.86 km (1 to 49 miles).

Average distance traveled per day by the seven walleye was 0.71 km (0.44 miles), with a range of 0.03 to 3.43 km (0.02 to 2.13 miles) per day. Walleye were the only species that displayed a net upstream movement; 2.88 km (1.79 miles) per fish for the seven walleye returned.

Table 7 summarizes data on the movement of northern pike tagged in 1974. No returns were received from fish tagged below Lock and Dam 3, probably due to the small number tagged (11 fish). Northern pike traveled the shortest average distance of the four main species; 15.93 km (9.90 miles) with a range of 1.21 to 41.04 km (0.75 to 25.5 miles). Northern pike also traveled the shortest average distance per day, 0.19 km (0.12 miles) per day. Northern pike displayed a net downstream movement of 9.53 km (5.92 miles) per fish.

The greatest average distance traveled per day for any one fish was 6.49 km (4.03 miles) per day for a white bass, which

	Number of Fish Tagged	Number of Fish Recaptured	% Recaptured	Number of Fish Traveled	Average Distance Traveled (Range-km•)	Average Days to Recapture (Range)	Average Distance Traveled Per Day (Range-km.)
TAGGED ABOVE L & D 3*	90	2	2.2	2	28.78 (4.83-52.71)	128 (64-192)	0.24 (0.03-0.82)
MOVEMENT: Upstream		1	1.1	1	52.71	64 (64)	0.82
Downstream		1	1.1	1	4.83	192 (192)	0.03
TAGGED BELOW L & D 3	120	5	4.1	5	49.65 (1.61-78.86)	6 (23-44)	1.38 (1.05-3.43)
Upstream		3	2.5	3	36.74 (1.61-61.56)	38.7 (33-44)	0.95 (0.05-1.87)
Downstream		2	1.6	2	69.01 (59.14-78.86)	32 (23-41)	2.16 (1.45-3.43)
TOTAL TAGGED	210	7	3.3	7	43.68 (1.61-78.86)	67.3 (23-192)	0.71 (0.03-3.43)
Upstream		4	1.9	4	40.73 (1.61-61.56)	45 (33-64)	0.90 (0.05-1.87)
Downstream		3	1.4	3	47.60 (4.83-78.86)	85.3 (23-192)	0.56 (0.03-3.43)

Table 6 - Movement and rate of travel of tagged walleye, 1974

\*Lock and Dam 3

	Number of Fish Tagged	Number of Fish Recaptured	% Recaptured	Number of Fish Traveled	Average Distance Traveled (Range-km.)	Average Days to Recapture (Range)	Average Distance Traveled Per Day (Range-km.)
TAGGED ABOVE L & D 3*	101	6	6.0	5	15•93 (1•21-41•04)	71 (1-234)	0.19 (0.02-0.74)
MOVEMENT:							
Upstream		3	3.0	3	3.75 (1.21-8.85)	28 (1-71)	0.13 (0.02-0.74)
Stationary		1	1.0	1	-	1 (1)	
Downstream		2	2.0	2	34.20 (27.36-41.04)	170.5 (107-234)	0.19 (0.11-0.39)
TAGGED BELOW L & D 3	11	0	-	-	-	<b>-</b> .	<b></b>
TOTAL TAGGED	112	6	5•4	5	15.93 (1.21-41.04)	71 (1-234)	0.19 (0.02-0.74)
MOVEMENT:						•	
Upstream		3	2.7	3	3.75 (1.21-8.85)	28 (1 <b>-</b> 71)	0.13 (0.02-0.74)
Stationary		1	0.9	-	-	1 (1)	-
Downstream		2	1.8	2	34•20 (27•36-41•04)	170.5 (107-234)	0.19 (0.11-0.39)
		••••••••••••••••••••••••••••••••••••••	<u> </u>		······································		······································

Table 7 - Movement and rate of travel of tagged northern pike, 1974

\*Lock and Dam 3

was tagged April 25, 1974 below Lock and Dam 3 and caught eight days later at the railroad bridge near Hudson, Wisconsin, 51.90 km (32.25 miles) upstream.

Walleyes moved the longest average distance, 0.71 km (0.44 miles) per day, of the four main species. White bass were next at 0.63 km (0.39 miles) per day, then saugers at 0.42 km (0.26 miles) per day, and finally northern pike at 0.19 km (0.12 miles) per day.

Of the 92 total returns, 12 were caught by anglers less than 10 days after being tagged. Two were caught within two days after being tagged.

Of 86 returns from the four main species, 61 had moved an appreciable distance when recaptured; 38 moved downstream from the area tagged; and 23 moved upstream. Twenty five fish were caught in the same general area where tagged.

## SCALE SAMPLES

The length-frequency distributions of fishes used for scale samples in the Prairie Island vicinity in 1974 are shown in Appendix F.

The summer and fall, 1973 scale analyses provide much data for age and growth statistics. To aid in the calculations for age and growth, the Iowa FORTRAN SHAD Program was used (Mayhew, 1973).

#### Analytical Methods - FORTRAN SHAD

This program was written and revised in Iowa to aid their fisheries biologists with the tedious computations of mathematical equations associated with age and growth statistics. FORTRAN SHAD is a complete age and growth program and contains routines for length-weight regression, body condition factors, body-scale regression, length-frequency distribution, and back calculation of body length at the end of each year of life. The program provides routines for single and multiple regression analysis, analysis of variance, plotting, and obtaining frequency distribution.

Limitations of parameters were a maximum of 400 fish in the sample, maximum age of nine-year old fish, and a maximum of 30 length intervals. Metric values were used for data collected in this study. Class intervals for obtaining frequency distribution of the total length (TL) was 15 and 25mm. If any fish in a sample exceeds 500mm, the frequency interval was set at the higher value, otherwise the interval was 15mm. The body condition factor (K) and means for TL (mm) weight (gm) and scale radius (mm) were printed for each size interval.

The condition factor, K, for the  $i^{th}$  class interval is a truncated integer

$$K = (1/L_1)^3 (W_1) \times 10^4$$

where L is equal to total length and W is equal to the weight.

For zero frequency the condition factor is not computed. The length-weight relationship for grouped means is expressed as a logrithmic regression equation

$$\log_{10}W_{i} = \beta_{0} + \beta_{1} (\log_{10}L_{i})$$

where  $\hat{\beta}_0$  is the Y intercept,  $\hat{\beta}_1$  is the slope of the regression line plotted by the computer using the raw data -- i.e., the actual lengths and weights taken from the collected fish (Mayhew, 1973).

The body-scale relationship and the back calculation of body length (TL) at the end of each year of life were derived using the Dahl-Lea direct proportion method.

$$L_{ij} - \hat{\beta}_{o} = \frac{\bar{S}_{ij}}{S_{i}} (L_{j} - \bar{S}_{j}) \quad i, j, \dots, \text{NAGE}$$

Where  $L_{ij}$  is the estimated body length at age i, annulus j,  $\widehat{B}_{0}$  is the x-intercept,  $\overline{S}_{ij}$  is the mean scale radius at age i, annulus j,  $\overline{S}_{i}$  is the mean scale radius at age i,  $L_{j}$  is the body length at annulus j,  $\overline{S}_{i}$  is the mean scale radius at annulus j, NAGE is the known age (Mayhew, 1973).

From this, increments of growth from year to year for each age class of fish is computed. Percent deviation of growth year to year can be calculated (Hile, 1941).

#### Length-Frequency Distribution

Length-frequency distributions of thirteen species of fish collected in 1973 are shown in Tables 8-20. Length groups for each species are set up as stated previously. The tables also show the average or mean length and weight for each length group. Condition factors (K) are also shown in these tables.

#### Condition Factor

The condition factor "K" is an expression of the relative "plumpness" or "leanness" of a fish, as expressed earlier.

If the value of "K" increases for longer fish, this indicates that the weight increases proportionately more than the cube of the length; and conversely, as "K" declines for longer fish, it indicates that the weight increases proportionately less than the cube of the length.

An important use of condition factors is for making comparisons of the relative well being of fish at different times (Rounsefell and Everhart, 1953).

#### Length-Weight Relationship

Relationship between length and weight of fish is approximately a cubic relationship, i.e., if the length doubles, the weight

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
264.0 - 289.0 $289.0 - 314.0$ $314.0 - 339.0$ $339.0 - 364.0$ $364.0 - 389.0$ $389.0 - 414.0$ $414.0 - 439.0$ $439.0 - 464.0$ $464.0 - 489.0$ $489.0 - 514.0$ $514.0 - 539.0$	2 0 10 7 3 4 9 9 9 9 7 3	272.50 0.0 329.20 353.29 383.33 409.00 428.33 450.33 477.22 497.57 518.33	200.00 0.0 358.50 440.71 545.00 680.00 825.00 916.67 1103.89 1295.00 1341.67	0.99 0.0 1.00 1.00 0.97 0.99 1.05 1.00 1.02 1.05 0.96
539.0 - 564.0 564.0 - 589.0 589.0 - 614.0 614.0 - 639.0 639.0 - 664.0	1 1 7 2 1	561.00 588.00 603.14 624.50 645.00	1820.00 1840.00 2025.00 2280.00 2805.00	0.91 0.92 0.94 1.05

Table 8 - Length-frequency distribution of walleye, 1973

Table 9 - Length-frequency distribution of sauger, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
212.0 - 237.0	1	212.00	<b>8</b> 0.00	0.84
262.0 - 287.0	25	274.60	184.60	0.89
287.0 - 312.0	32	<b>299.</b> 31	248.28	0 <b>.9</b> 3
312.0 - 337.0	36	323.39	316.53	0.94
337.0 - 362.0	45	352.44	408.11	0 <b>.9</b> 3
362.0 - 387.0	33	375-27	505.61	0.96
387.0 - 412.0	33	401.48	641.21	0.99
412.0 - 437.0	17	421.71	<b>755.</b> 00	1.01
437.0 - 462.0	17	450.71	912.94	1.00
462.0 - 487.0	19	473.84	10 <b>49.</b> 74	0 <b>.99</b>
487.0 - 512.0	10	496.70	1186.50	0.97
512.0 - 537.0	2	528.00	1425.00	0.97

Table 10 - Length-frequency distribution of white bass, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
201.0 - 216.0	6	206.67	126.67	1.43
216.0 - 231.0	7	222.29	150.71	1.37
231.0 - 246.0	2	238.50	192.50	1.42
246.0 - 261.0	2	257.50	237.50	1.39
261.0 - 276.0	5	269.40	291.00	1.49
276.0 - 291.0	5	283.40	333.00	1.46
291.0 - 306.0	21	299.00	384.76	1.44
306.0 - 321.0	37	315.30	451.89	1.44
321.0 - 336.0	54	329.39	523.98	1.47
336.0 - 351.0	50	344.56	595.20	1.46
351.0 - 366.0	44	358.98	661.36	1.43
366.0 - 381.0	20	372.90	702.50	1.35
381.0 - 396.0	15	386.73	740.00	1.28
396.0 - 411.0	ĺ	411.0	1200.00	1.73
411.0 - 426.0	2	414.50	977.50	1.37
426.0 - 456.0	0	0.0	0.0	0,0
456.0 - 471.0	1	465.00	620.0	0.62

Table 11 - Length-frequency distribution of smallmouth bass, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
166.0 - 181.0	2	1 <b>69.</b> 00	77.50	1.61
1 <b>81.</b> 0 - 1 <b>96.</b> 0	5	18 <b>9.2</b> 0	112.00	1.65
1 <b>96.</b> 0 - 211.0	6	205.67	135.83	1.56
211.0 - 226.0	7	220.43	159.29	1.49
226.0 - 241.0	3	232.00	183.33	1.47
241.0 - 256.0	4	250.25	256.25	1.64
256.0 - 271.0	6	267.17	300.83	1.58
271.0 - 286.0	5	280,20	340.00	1.55
<b>286.</b> 0 - 301.0	3	295.00	416.67	1.62
301.0 - 316.0	6	308.33	489.17	1.67
316.0 - 331.0	8	322.50	545.63	1.63
331.0 - 346.0	4	340.25	658.75	1.67
346.0 - 361.0	l	349.00	730.00	1.72
361.0 - 376.0	3	370.00	780.00	1.54
376.0 - 391.0	1	380.00	640.00	1.17

Table 12 - Length-frequency distribution of drum, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
177.0 - 202.0	2	180.50	70.00	1.19
202.0 - 227.0	5	217.40	121.00	1.18
227.0 - 252.0	29	243.76	185.52	1.28
252.0 - 277.0	44	266.68	235.11	1.24
277.0 - 302.0	26	288.88	293.65	1.22
302.0 - 327.0	22	316.14	379.31	1.20
327.0 - 352.0	16	340.06	485.63	1.23
352.0 - 377.0	10	<b>363.</b> 60	601.00	1.25
377.0 - 402.0	5	385.00	767.00	1.34
402.0 - 427.0	7	412.86	867.14	1.23
427.0 - 452.0	3	433.00	1088.33	1.34
452.0 - 477.0	2	469.00	1597.50	1.55
477.0 - 502.0	е ст. <b>1</b> . се ст.	481.00	1400.00	1.26
502.0 - 527.0	1	515.00	1840.00	1.35

Table 13 - Length-frequency distribution of northern pike, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
1 <b>99.0 - 224.</b> 0	l	1 <b>99.</b> 00	200.00	2.54
224.0 - 399.0	0	0.0	0.0	0.0
399.0 - 424.0	2	420.00	460.00	0.62
424.0 - 449.0	4	433.50	486.25	0.60
449.0 - 474.0	2	461.00	675.00	0.69
474.0 - 499.0	5	491.00	734.00	0.62
499.0 - 524.0	11	513.18	945.00	0.70
524.0 - 549.0	8	537.13	1006.25	0.65
549.0 - 574.0	8	556.63	1157.50	0.67
574.0 - 599.0	7	584.00	1447.86	0.73
599.0 - 624.0	6	614.50	1453.33	0.63
624.0 - 649.0	2	634.00	1435.00	0.56
649.0 - 674.0	3	659.67	1773.33	0.62
674.0 - 699.0	4	687.75	1953.75	0.60
699.0 - 724.0	1	714.00	2295.00	0.63
724.0 - 749.0	1	745.00	2840.00	0.69
749.0 - 774.0	0	0.0	0.0	0.0
774.0 - 799.0	1	<b>79</b> 0.0	3180.00	0.64
799.0 - 824.0	1	821.00	4240.00	0.77
824.0 - 849.0	· · · 1	833.00	3705.00	0.64
849.0 - 874.0	0	0.0	0,0	0.0
874.0 <b>- 899.</b> 0	3	886.00	4813.33	0.69
899.0 - 924.0	1	915.00	4300.00	0.56
924.0 - 949.0	1	937.00	5400.00	0.66
949.0 - 974.0	1	960.00	7000.00	0.79
974.0 - 999.0	0	0.0	0.0	0.0
999.0 -1024.0	1	1010.00	7180.00	0.70

Table 14 - Length-frequency distribution of channel catfish, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
282.0 - 307.0	l	296.00	200.00	0 <b>.77</b>
307.0 - 332.0	2	326.50	270.00	0.78
332.0 - 357.0	2	335.50	320.00	0.85
357.0 - 382.0	2	370.00	385.00	0.76
382.0 - 407.0	3	400.67	511.67	0.80
407.0 - 432.0	3	424.00	741.67	0 <b>.97</b>
432.0 - 457.0	2	442.00	492.50	0.57
457.0 - 482.0	6	471.50	981.67	0.94
482.0 - 507.0	2	488.00	852.50	0.73
507.0 - 532.0	1	515,00	1380.00	1.01
532.0 - 557.0	2	542.50	1400.00	0.88
557.0 - 582.0	6	<b>566.5</b> 0	1624.17	0.89
582.0 - 607.0	1	583.00	1980.00	1.00

Table 15 - Length-frequency distribution of black crappie, 1973

		AVERAGE	AVERAGE	CONDITION
LENGTH GROUPS	NO. OF FISH	LENGTH	WEIGHT	FACTOR (K)
120.0 - 135.0	6	126.50	42.00	2.07
135.0 - 150.0	13	144.38	55.38	1.84
150.0 - 165.0	14	158.43	63.93	1.61
165.0 - 180.0	5	168.60	73.00	1.52
180.0 - 195.0	l	191.00	80.00	1.15
195.0 - 210.0	2	205.50	137.50	1.58
210.0 - 225.0	4	220.75	178.75	1.66
225.0 - 240.0	4	229.00	203.75	1.70
240.0 - 255.0	5	248.00	275.00	1.80
255.0 - 270.0	11	261.18	311.82	1.75
270.0 - 285.0	7	273.29	347.14	1.70
285.0 - 300.0	5	293.40	416.00	1.65
300.0 - 315.0	0	0.0	0.0	0.0
315.0 - 330.0	1	317.00	560.00	1.76
550.0 - 545.0	U D	0.0	0.0	0.0
<b>345.0 - 360.0</b>	2	555.00	512.50	1.15

Table 16 - Length-frequency distribution of bluegill, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
100.0 - 115.0	18	108.28	30.28	2.39
115.0 - 130.0	33	123.09	44.55	2.39
130.0 - 145.0	12	136.33	60,00	2.37
145.0 - 160.0	4	151.50	96,25	2.77
160.0 - 175.0	7	169.14	135.71	2.80
175.0 - 190.0	5	183.80	178.00	2.87
190.0 - 205.0	5	200.40	221.00	2.75
205.0 - 220.0	1	211.00	305.00	3.25

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
<b>99.0 - 114.</b> 0	10	10 <b>6.9</b> 0	32.50	2.66
114.0 - 129.0	7	122.71	46.43	2.51
129.0 - 144.0	15	135.80	60.67	2.42
144.0 - 159.0	8	150.88	76.88	2.24
159.0 - 174.0	12	166.00	110.00	2.40
174.0 - 189.0	10	181.30	143.00	2.40
189.0 - 204.0	6	195.50	175.00	2.34
204.0 - 219.0	2	210.00	215.00	2.32
219.0 - 234.0	l	223.00	<b>29</b> 0.00	2.62
234.0 - 249.0	2	237.50	280.00	2.09

Table 17 - Length-frequency distribution of rock bass, 1973

Table 18 - Length-frequency distribution of carp, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
101.0 - 126.0	2	105.00	25.00	2.16
126.0 - 151.0	5	137.80	46.00	1.76
151.0 - 176.0	2	163.50	70.00	1.60
176.0 - 201.0	2	194.00	112.50	1.54
201.0 - 276.0	• • O	0.0	0.0	0.0
276.0 - 301.0	· , 4	291.25	405.00	1.64
301.0 <b>- 326.</b> 0	7	314.57	430.71	1.38
<b>326.</b> 0 - <b>351.</b> 0	14	337.93	515.36	1.34
351.0 - 376.0	14	364.07	612.14	1.27
376.0 - 401.0	15	386.13	704.80	1.22
401.0 - 426.0	10	415.40	905.50	1.26
426.0 - 451.0	10	437.10	1112.00	1.33
451.0 - 476.0	19	465.58	1259.21	1.25
<b>476.</b> 0 - 501.0	8	4 <b>9</b> 0.88	1616.88	1.37
501.0 <b>- 526.</b> 0	7	517.86	1915.71	1.38
526.0 - 551.0	11	537.27	1985.45	1,28
<b>551.0 - 576.</b> 0	3	559.67	2010.00	1.15
<b>576.</b> 0 - <b>6</b> 01.0	10	586.80	<b>2866.</b> 00	1.42
<b>601.0 - 626.</b> 0	5 .	618.80	3180.00	1.34
626.0 - 651.0	3	633.67	3800.00	1.49
<b>651.0 - 676.</b> 0	0	0.0	0,0	0.0
676.0 - 701.0	2	684.00	<b>3780.0</b> 0	1.18

Table 19 - Length-frequency distribution of shorthead redhorse, 1973

 $\mathbb{C}_{n} \geq \mathbb{N}$ 

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
134.0 - 159.0 $159.0 - 184.0$ $184.0 - 209.0$ $209.0 - 234.0$ $234.0 - 259.0$ $259.0 - 284.0$ $284.0 - 309.0$ $309.0 - 334.0$ $334.0 - 359.0$ $359.0 - 384.0$ $384.0 - 409.0$ $409.0 - 434.0$ $434.0 - 459.0$ $459.0 - 484.0$ $484.0 - 509.0$	1 0 1 4 3 7 3 13 11 15 21 23 22 11	134.00 0.0 200.00 219.00 242.25 274.67 299.14 314.67 347.00 367.09 400.20 421.95 446.61 471.05 495.09	35.00 0.0 85.00 120.00 153.75 220.00 288.57 346.67 476.92 556.36 737.33 850.71 977.39 1142.95 1247.73	1.45 0.0 1.06 1.14 1.08 1.06 1.08 1.11 1.14 1.12 1.15 1.13 1.10 1.09 1.03
559.0 - 584.0	0 1	582.00	2110.00	1.07

Table 20 - Length-frequency distribution of gizzard shad, 1973

LENGTH GROUPS	NO. OF FISH	AVERAGE LENGTH	AVERAGE WEIGHT	CONDITION FACTOR (K)
LENGTH GROUPS 150.0 - 165.0 165.0 - 180.0 180.0 - 195.0 195.0 - 240.0 240.0 - 255.0 255.0 - 270.0 270.0 - 285.0 285.0 - 300.0 300.0 - 315.0 315.0 - 330.0 345.0 - 360.0 360.0 - 375.0 375.0 - 390.0	<u>NO. OF FISH</u> 4 2 0 1 1 4 5 5 5 3 0 1 1 2	LENGTH 159.25 172.00 0.0 244.00 259.00 273.75 294.00 307.40 318.33 0.0 359.00 365.00 386.50	WEIGHT 45.00 55.00 0.0 0.0 170.00 180.00 232.50 296.00 344.00 370.00 0.0 555.00 650.00 697.50	FACTOR (K) 1.11 1.08 0.0 0.0 1.17 1.04 1.13 1.16 1.18 1.15 0.0 1.20 1.34 1.21
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	4 5 4 2 0 1	398.50 413.60 428.00 436.50 0.0 486.00	905.00 886.00 1028.00 1090.00 0.0 700.00	1.43 1.25 1.31 1.30 0.0 0.61

would be expected to increase by a factor of eight. If the bodily proportions of fish remained constant throughout life, a cubic relationship would hold true. Since this is not the case, and body proportions do change, it follows that the weight does not vary exactly with the cube of length (Krosch, 1969).

Length-weight relationships for 13 species of fish are shown in Figures 7-19. Grouped mean values are shown as solid points and calculated values are shown as solid points within circles.

#### Body-Scale Relationship

The Dahl-Lea direct proportion method was used by the computer to obtain back calculation of body length at the end of each year's growth and increments of growth. Estimated body lengths and increments of growth for five species of fish (walleye, sauger, white bass, smallmouth bass, and drum) are shown in Tables 21-30. Hile (1941) used a method to compare growth from year to year. This same method was used to compare growth of five species of fish from 1965-1972. Percent deviations from 1965-1972 average growth for these five species are shown in Table 31 and Figure 20.

Walleye and sauger deviations for 1969 and 1970 are almost directly opposite. White bass and drum growths from 1969 to 1970 were almost constant. Walleye, sauger, white bass, and smallmouth bass had an increase in growth between 1971 and 1972.

#### ANCILLARY STUDIES

#### Temperature Study

Temperatures at Station 4, Sturgeon Lake for April-June, 1974, are shown in Figure 21. Electro-fishing was conducted during April and May. Ripe walleye males were caught on April 15 below Lock and Dam 3 and on April 16 in Sturgeon Lake. Ripe walleye females were caught on April 17 below Lock and Dam 3 and on April 19 in Sturgeon Lake. The temperature at Station 4 on April 18





TOTAL LENGTH IN MILLIMETERS



FIGURE IO. LENGTH-WEIGHT RELATIONSHIP OF GROUPED MEANS FOR SMALLMOUTH BASS, 1973.

1,000

WEIGHT IN GRAMS



• =GROUPED MEAN VALUES Log\_W=-4.8767+ 3.03II ( Log\_L)

O NUMBER OF FISH

5)



## TOTAL LENGTH IN MILLIMETERS



FIGURE II. LENGTH-WEIGHT RELATIONSHIP OF GROUPED MEANS FOR FRESHWATER DRUM, 1973.

# FIGURE 12. LENGTH-WEIGHT RELATIONSHIP OF GROUPED MEANS FOR NORTHERN PIKE, 1973





## TOTAL LENGTH IN MILLIMETERS

# FIGURE 14. LENGTH-WEIGHT RELATIONSHIP OF GROUPED MEANS FOR BLACK CRAPPIE, 1973

1000

WEIGHT IN GRAMS

100

● =Calculated value
 ● =Grouped mean value
 ○ =Number of fish
 log<sub>10</sub> w = -4.476 + 2.8694(log<sub>10</sub>L)

10

TOTAL LENGTH IN MILLIMETERS

400

(1)

4

2

5

4

(5

(3)

6

100

(2)

# FIGURE 15. LENGTH-WEIGHT RELATIONSHIP OF GROUPED MEANS FOR BLUEGILL, 1973.



TOTAL LENGTH IN MILLIMETERS





TOTAL LENGTH IN MILLIMETERS

FIGURE 17. LENGTH-WEIGHT RELATIONSHIP OF GROUPED MEANS FOR CARP, 1973.



TOTAL LENGTH IN MILLIMETERS

# FIGURE 18. LENGTH-WEIGHT RELATIONSHIP OF GROUPED MEANS FOR SHORTHEAD READHORSE, 1973.

10,000

1,000

WEIGHT IN GRAMS

10 10



1,000

r. v. .

# FIGURE 19. LENGTH-WEIGHT RELATIONSHIP OF GROUPED MEANS FOR GIZZARD SHAD, 1973.



TOTAL LENGTH IN MILLIMETERS

Year	Number			NUMBER OF ANNULI				
Class	<u>of Fish</u>	I	II	III	IV	V	VI	VII
1972	18	95.32						
1971	30	120 <b>.97</b>	232.14					
1 <b>97</b> 0	123	116.56	233.07	305.38				
1969	71	116.39	236.04	302.06	348.25			
1 <b>96</b> 8	22	108.72	235.20	304.51	348.29	373.27		
1967	5	101.60	195.56	273.31	314.57	342.00	362.13	
1966 GRAND AVERAGE	2	105 <b>.9</b> 8	236.57	299.22	326.40	343.76	359.61	375-47
LENGTH		109.36	228.10	<b>296.9</b> 0	334.38	353.01	360.87	375•47

Table 26 - Increments of growth of white bass, 1973

Year	Number	YEAR OF GROWTH						
Class	of Fish	1	2	3	4	5	6	7
1972	18	95.33						
1971	30	120.98	111.17					
1 <b>97</b> 0	123	116.56	116.51	72.31				
1969	71	116.39	119.65	66.02	46.19			
1968	22	108.72	126.47	69.31	43.78	24.98		
1967	5	101.60	93.96	77.75	41.27	27.43	20.13	
1966	2	105 <b>.98</b>	130.59	62.65	27.18	17.36	15.85	15.85
GRAND								
AVERAGE								
LENGTH		109.36	116.39	69.61	<b>39.6</b> 0	23.26	17.99	15.85
Year	Number							
-------------------	----------	------------------------	------------------	------------------	--------			
Class	of Fish	I	II	III	IV			
1972 1971	16 22	<b>64.5</b> 0 59.70	163.81					
1970 1969	22 4	65.72 60.56	156.35 143.02	249.62 224.23	282.51			
AVERAGE LENGTH		62.62	154.39	236.92	282.51			

Table 27 - Estimated body length of smallmouth bass at annulus formation, 1973 sample

Table 28 - Increments of growth of smallmouth bass, 1973

Year	Number				
Class	of Fish	l	2	3	4
1972 1971 1970 1969	16 22 22 4	64.50 59.70 65.72 60.56	104.11 90.63 82.45	93.26 81.21	58.28
GRAND AVERAGE LENGTH		62.62	92.40	87.24	58.28

Year	Number	-		NUM	BER OF ANNU	LI		-
Class	<u>of Fish</u>	I	II	111	IV	v	VI	VII
1972 1971 1970 1969 1968 1967 1966	4 32 65 33 27 9 3	67.48 97.61 88.06 85.28 81.08 88.27 73.38	200.76 187.56 186.38 180.52 183.09 196.09	250.71 252.24 238.94 251.54 263.87	301.81 294.67 314.01 318.80	333.36 362.62 371.17	<b>395.6</b> 5 422.00	454.86
GRAND AVERAGE LENGTH		83.02	189.07	251.46	307.33	355•72	408.83	454.86

Table 30 - Increments of growth of drum, 1973

Year	Number			YE	AR OF GROWI	H		
Class	of Fish	1	2	3	4	5	6	7
1972	4	67.48						
1971	32	97.61	103.15					
1 <b>97</b> 0	65	88.06	<b>99.</b> 50	63.15				
1969	33	85.28	101.10	65.86	49.57			
1968	27	81.08	99.44	58.42	55.74	38.69		
1967	9	88.27	94.81	68.46	62.47	48.61	33.03	
1 <b>96</b> 6 GRAND	3	73.38	122.71	67.77	54.94	52.37	50.83	32.86
AVERAGE								
LENGTH		83.02	103.45	64.73	55.68	46.55	41.93	32.86

	Perc	ent Dev	iation F	rom Avera	age Growt	h In Cal	endar Y	ear
Species	1965	1966	1967	1968	1969	1970	1971	1972
White bass	<b>673</b> )	-	10.46	22.16	4.22	3.71	6.16	8.06
Sauger	-	-6.38	-17.36	-10.98	-1.16	10.51	4.05	8.54
Walleye	-0.70	-1.99	-0.42	-4.40	6.77	-5.25	-1.13	6.45
Smallmouth bass	-	-	-	-	-	-16.34	-6.88	6.88
Drum	-	-	26.16	0.51	3.72	3.34	1.64	-9.19

Table 31 - Percentage deviations of growth from 1965-1972 average for five species of fish in the Prairie Island area





was  $2.8^{\circ}C$   $(37^{\circ}F)$ . This was somewhat below a statewide range of  $5.6^{\circ}C$   $(42^{\circ}F) - 11.1^{\circ}C$   $(52^{\circ}F)$  for 1974 (Daley, personal communication, 1975). On April 30, temperatures in Sturgeon Lake reached the upper range of  $11.1^{\circ}C$ . These temperatures and dates are very close to those when the Section of Fisheries was stripping walleye below Lock and Dam 3. Ripe female walleye were stripped from April 17 to April 26, 1974 below Lock and Dam 3 (Sternberg, personal communication, 1975).

Ripe sauger males were found at Station 4 on April 24 and ripe females were found on May 1, 1974. The temperature ranged from  $7^{\circ}$ C to 11° from April 24 - May 16. This is within the range for spawning saugers (Scott and Crossman, 1973, Carufel, 1963, and Priegel, 1969). Ripe female sauger were found on April 25, 1974 below Lock and Dam 3. Based on this information, it appears that walleye and sauger may spawn in Sturgeon Lake along the north shore.

#### Intake Bubbler Study

The summary of electro-fishing catch for the intake bubbler study August 12-16, 1974 is shown in Table 32. Length-frequency of fishes caught electro-fishing for the intake bubbler study are shown in Appendix G. Daily catches of the most abundant species are shown in Table 33.

The greatest percentage (38.26%) of the total catch for the bubbler study was white bass. Carp (14.78%) were the second most abundant species caught. Other abundant species caught were: rock bass (12.93%), gizzard shad (11.64%), bluegill (6.83%), green sunfish (3.69%), drum (2.77%), and black crappie (2.21%). All other species caught (Table 32) comprised 6.89 percent of the total catch.

## Table 32 - Summary of electro-fishing catch for intake bubbler study, August 12-16, 1974

Species	Total (wk.)	% To <b>ta</b> l
Shortnose gar	l	0.18
Longnose gar	l	0.18
Gizzard shad	63	11.64
Shorthead redhorse	6	1.10
Carp	80	14.78
Silver chub	4	0.73
Emerald shiner	2	0.63
Roseyface shiner	۰ ٦	0.18
Bullhead minnow	1	0.18
Channel catfish	5	0 <b>.92</b>
Flathead catfish	1	0.18
White bass	207	38.26
Sauger	2	0.63
Walleye	5	0.92
Smallmouth bass	4	0.73
Largemouth bass	3	0,55
Green sunfish	20	3.69
Bluegill	37	6.83
Rock bass	<b>7</b> 0	12.93
White crappie	l	0.18
Black crappie	12	2.21
Drum	_15	2.77
	541	100.0

Date	8/	´12	8/	<i>'</i> 13	8/	′1 <b>4</b>	8/	′1 <b>5</b>	8/	′16
Species	Number Caught	% of Daily Catch								
Gizzard shad	16	16.16	16	13.55	4	3.38	19	18.0 <b>9</b>	8	7.92
Carp	21	21.21	22	18.64	23	19.49	7	6.66	7	6.93
White bass	18	18.18	34	28.81	57	48.30	43	40 <b>.95</b>	55	54.45
Green sunfish	3	3.03	3	2.54	3	2.54	7	6.66	4	3.96
Bluegill	12	12.12	9	7.62	4	3.38	7	6.66	5	4.95
Rock bass	1 <b>7</b>	17.17	20	16.94	16	13.55	11	10.47	6	5.94
Black crappie	5	5.05	<b>.</b>	0	2	1.69	3	2.85	2	1.98
Drum	2	2.02	3	2.54	1	0.85	5	4.76	4	3.96
Other	5	5.05	11	9.32	8	6.78	3	2.85	10	<b>9.9</b> 0
Total	99	100	118	100	118	100	105	100	101	100
Total Catch Per Hour	19	8.0	236	•0	236	.0	21	0.0	20	2.0

Table	33	-	Electro-fishin	g daily	catches	of	most	abundant	species	for	intake	bubbler
			study, August	12-16, 3	1974							

The total number of fish caught each day remained about the same (around 100). The number of white bass caught increased through the week. The number of white bass caught on Friday (55) was three times greater than the catch on the preceding Monday (18). Carp numbers remained constant the first three days (21-23) but dropped to seven for Thursday and Friday. Catches of the remaining abundant species (Table 33) fluctuated during the sampling period.

All of the gizzard shad and most of the white bass caught were young-of-the-year (Y/Y). Most of the carp caught were adults, 30-65 cm. Most sizes of rock bass and bluegill were represented in the sample (Appendix F).

Most of the carp were caught near the bubbler. The carp may have been attracted to the bubbler because of suspended matter caused by the bubble screen. The abundance of rock bass, bluegill, and black crappie in the area between the bubbler and skimmer wall could possibly be due to the increase of good habit. Riprap appears to be very good habitat for centrarchid fish. The above information indicates the intake bubbler was not effective in keeping fish away from the immediate intake area.

#### Larval Towing

Tows were made in the Prairie Island area in order to catch larval fish. Four sampling stations are shown in Figure 22. Catches of larval fish are recorded in Table 34. This section attempts to determine (a) the time when maximum numbers of larval fish are present, and (b) effects of wind upon catches of larval fish.

Logarithms of numbers of ichthyoplankton per 50 meters of tow were plotted against calendar days (Figure 23) in an attempt to illustrate seasonal variations and to isolate extreme values. A line of central tendency was fitted by inspection.



FIGURE 22. DIAGRAM OF LARVAL FISH TOWS AT PRAIRIE

	Tow No	. 1 Catch	Tow N	o. 2 Catch	Tow No	. 3 Catch	Tow No	. 4 Catch
Date	Total Number	Number per 50M*Tow	To <b>ta</b> l Number	Number per 50M*Tow	Total Number	Number per 50M*Tow	Total Number	Number per 50M*Tow
5- 8-74	0	0.00	• 7	1.40	18	18.00	4	0.80
5-10-74	15	3 <b>.7</b> 5	22	4.40	0	0.00	92	18.40
5-24-74	ĩ	0.25	31	6.20	1	1.00	3	0.60
6- 4-74	22	5.50	2	0.40	48	48.00	. ĺ	0.80
6-10-74	126	31.50	334	<b>66.8</b> 0	44	44.00	7	1.40
6-17-74	61	15.25	36	7.20	21	21.00	5	1.00
6-24-74	<b>6</b> 0	15.00	67	13.40	30	30,00	í	0.20
6-28-74	140	35.00	125	25.00	12	12.00	9	1.80
7- 2-74	115	28.75	55	11.00		3.00	5	1.00
7- 5-74	34	8,50	500	100.00	5	5,00	3	0.60
7- 8-74	400	100.00	1024	204.80	140	140.00	34	6.80
7-15-74	1009	252.25	314	62.80	84	84.00	34	6.80
7-19-74	1746	436.50	6900	1380.00	211	211.00	182	36.40
7-22-74	1762	440.50	1800	360.00	278	278.00	61	12.20
7-26-74	470	117.50	62	12.40	608	608.00	16	3.20
7-29-74	2257	564.25	342	68.40	127	127.00	37	7.40
8-2-74	103	25.75	-	-	1155	1155.00	-	-
8- 5-74	250	62.50	<b>28</b> 0	56.00	354	354.00	12	2.40
8- 9-74	193	48,25	70	14.00	18	18.00	6	1.20
8-12-74	342	85.50	179	35,80	19	19.00	7	1.40
8-16-74	31	7.75	18	3.60	18	18.00	4	0.80
8-19-74	$\tilde{41}$	10,25	24	4.80		8,00	3	0.60
8-23-74	14	3,50	3	0.60	5	5.00	13	2.60
8-26-74	1	0.25	1	0.20	-	-	ĩ	0.20
TOTAL	9,193	-	12,196	-	3,207	-	543	-
NUMBER						· .		
OF TOWS	24		23		23		23	
AVERAGE CATCH PER								
50M TOW		95.76		106.05		139.43		4.72
*Motor								

## Table 34 - Summary of larval towing for 1974



644 FIGURE 2

FIGURE 23. MEAN NUMBER OF LARVAL FISH PER 50 M. TOW FROM STATIONS 1,2, AND 3. Numbers of ichthyoplankton caught peaked during the last two weeks of July and the first week of August, 1974 (Figure 24). Means were calculated for catches during two-week blocks of time throughout the sampling period using data from Tow 3. These means again show that catches peaked during late July and early August.

Stations 2 and 4 had lower catches of larval fish than the other two stations. Tows at Stations 2 and 4 were made perpendicular to the current.

Wind direction and velocity are recorded continuously at the Prairie Island Generating Plant. These records were compared with catches of larval fish to determine whether or not there was any relationship between wind and catch rates. Two methods of comparison were used.

In the first method the line of central tendency in Figure 23 was used to point out extremely high or low catch values. The date for each extreme value was noted. Average wind direction and velocity were determined for the 24-hour period preceding each tow. When comparing this wind data for the days when high or low catches were made, no relationship was evident.

The following abnormally high values from the means for 1, 2, and 3 taken from Table 35.

Date	Wind Direction	Wind Velocity (mph)
6-4-74	S	10-60
6-10-74	NNW	20-40
		(7 pm on 6-9 until 10 am on 6-10)
	NE	20
		(9  am - 7  pm  on 6-9-74)
7-8-74	SE	20
7-19-74	W	0-5
8-2-74	S	15



TWO-WEEK PERIODS

# FIGURE 24. MEAN TOW NET CATCHES AT STATION NO.3

			Mean catch per 50M tow,
Date	Direction	Velocity (mph)	Tows 1,2, & 3
5-24-74	NW	35	2.48
6-4-74	S	10 <b>-6</b> 0	19.80
6-10-74	NNW	20-40 (7PM on 6-9 until 104	AM 47.43
6-17-74	N E NW	$\begin{array}{c} \text{on } 6-10-74)\\ 20  (9\text{AM}-7\text{PM on } 6-9-74)\\ 20 \end{array}$	14.48
6-24-74	Variable NE	0-8 during night 20 daylight hours	19.47
6-28-74	S	20	24.00
7-2-74	SE	20	14.25
7-5-74	NW Variable SE	30 (9AM-7PM on 7-4-74) 0-5 (7PM-11PM on 7-4-74) 10 (11PM-9AM on 7-5-74)	37.83
7-8-74	SE	20	148.27
7-15-74	W	5	133.02
7-19-74	W	0-5	<b>675.</b> 83
7-22-74	NW	20	359.50
7-26-74	W to SE (Var.)	0-10 (Var.)	245.97
7-29-74	WNW	25	253.22
8-2-74	S	15	590.38
8-5-74	NW	15-20 (9AM-9PM on 8-4-74) Calm (9PM-9AM on 8-5-74)	157.50
8-9-74	E	18	26.75
8-12-74	SW	30	46.77
8-16-74	SSW	20 (9AM on 8-15-74 to 2AM on 8-16-74)	9.78
	W	5-10 (2AM-10AM on 8-16-74)	
8-19-74	WSW Variable E	20 (9AM-7PM on 8-18-74) 0-10 (7PM-5AM on 8-19-74) 10 (5AM-9AM on 8-19-74)	7.68

Table 35 - Wind direction and velocity and means of catches for tow nos. 1,2, & 3 (for 24 hrs. preceding each sampling date)

A second method was also used to compare wind directions with larval fish catch data. Catch data from Tow Station 3 were divided according to direction of the winds during the 24 hours preceding each tow (Table 36). Sampling days for which winds were quite variable in direction were not included. Wind direction was divided into two categories: winds coming from the west, northwest, north, or northeast; and those coming from the east, southeast, south, and southwest. The numbers of larval fish per 50M tow were listed for each of the 18 days of relatively constant wind. A median was calculated for these 18 values. Twothirds (66.7%) of the tows made during the west-northeasterly winds yielded catches above the median. Only 33.3 percent of the tows made during the east-southwesterly winds yielded catches above the median (Figure 25). This seems to show that wind direction has an effect upon catch of larval fish. It appears that westerly, west northwesterly and northwesterly, southeasterly and southerly winds move larval fish into the intake canal area. More information is needed before a definite relationship between wind direction and larval fish catches can be established.

An attempt was made to correlate extreme catches (either high or low) at Station 3 with wind velocity. Catches on days when wind velocity was 20 mph or more were compared with catches on days when winds were less than 20 mph. A chi-square test showed that there was no significant relationship between wind velocity and catches of larval fish.

#### SUMMARY OF CONCLUSIONS

White bass comprised more than 25 percent of all fish trap netted in 1974. White bass, carp, and drum comprised more than 64 percent of the 1974 total trap summer and fall net catch. 1974 trap net catches of white bass and carp were twice as high as 1973 catches. Walleye and sauger comprised only four percent of the 1974 total trap net catch.

Experimental night electro-fishing was done in 1974. Walleye, sauger, and white bass catches at night were about twice as high

Wind from 27	70 <sup>°</sup> -89 <sup>°</sup> bearing V, N, NE)	Wind from 90 <sup>0</sup> (E, SE,	nd from 90 <sup>°</sup> -269 <sup>°</sup> bearing (E, SE, S, SW)		
Date	No./50M Tow	Date	No./50M*Tow		
5-24-74	ני געני	6-4-74	48		
6-10-74	44	6-28-74	12		
6-17-74	21	7-2-74	3		
6-24-74	30	7-8-74	140		
7-15-74	84	8-2-74	1155		
7-19-74	211	8-9-74	18		
7-22-74	278	8-12-74	19		
7-29-74	127	8-16-74	18		
8-5-74	354	8-19-74	8		

Table 36 - Wind directions and larval fish catches for Tow #3, May 24 - August 19, 1974

66.7% above median catch\*\*
\*Meter

\*\*Median catch =  $\frac{37 \text{ larval fish}}{50M \text{ Tow}}$ 

## FIGURE 25. TOW NET CATCHES AT STATION NO.3 VS. WIND DIRECTION MAY 24-AUGUST 12, 1974.



WIND DIRECTION

as day catches. Fall 1974 net catches of carp were more than five times that of 1973 catches. Almost 50 percent of fishes caught trawling were drum.

Seining results indicate a greater richness of species and greater distribution of individuals among species in 1974 than in 1973.

Hile's Abundance Index will be used to compare year to year variations in combined catches of all types of gear. The longest upstream movement in 1974 was 108.23 km (67.25 miles) to Taylors Falls, Wisconsin by a white bass. The longest downstream movement in 1974 was 136.31 km (84.7 miles) to below Lock and Dam 6 at Trempealeau, Wisconsin by a channel catfish. Additional years of tagging may further substantiate trends in fish movement in the Prairie Island area.

The data from 1973 scale samples were used in age and growth computations. Length-weight relationships for the 1973 fish are directly proportional. An increase in growth from 1971 to 1972 was seen in walleye, sauger, white bass, and smallmouth bass. The deviations in growth for 1969-1970 are directly opposite for walleye and sauger.

Station 1-4 in Sturgeon Lake appears to be suitable for walleye and sauger spawning.

The intake bubbler did not effectively keep fish from the immediate plant intake.

Larval fish catches were highest during late July and early August. Movement of larval fish into the intake canal area may be caused by westerly, northerly, and northeasterly winds. A chi-square test showed no significant relationship between wind velocity and catches of larval fish.

#### CONDITIONS AND OBSERVATIONS TO BE INVESTIGATED

Trap net sets will be made for four consecutive days at three stations in each area in order to obtain more statistically valid data. Gill nets will be set for two consecutive days at each of four stations in North and Sturgeon Lakes and the plant area. Night electro-fishing should be conducted in all areas during the entire sampling season for 1975.

If possible, an updated SHAD program will be initiated when available from Iowa State University. Scale samples will be taken in summer and fall from walleye and sauger, and scale samples from other species will be taken in the fall.

A more continuous and extensive temperature study will be conducted in association with spawning. Electro-fishing will be used in an attempt to locate spawning areas in North and Sturgeon Lakes above the plant. Drift nets will be used to locate the source of larval fish that become available for entrainment into the plant. Entrainment studies in the Prairie Island vicinity will begin in 1975. An intake bubbler evaluation study is presently underway.

#### LITERATURE CITED

- Carufel, L H, 1963. Life History of Saugers in Garrison Reservoir, Journal of Wildlife Mgt. 27(3): 450-456.
- Daley, S, 1975. Personal communication, Minn. Dept. of Natural Resources, Section of Fisheries.
- Finke, A H, 1964. White Bass Tagging Study, Upper Mississippi River, Wisc. Cons., Fish Mgmt. Div., Report #6.
- Hawkinson, B W, 1974. 1973 Fish Population Study Progress Report on the Mississippi River near Prairie Island, NSP Prairie Island Plant Environmental Monitoring Program Annual Report 1967.
- Hile, R, 1941. Age and Growth of the Rock Bass <u>Ambloplites</u> <u>Mupestris</u> (Rofinesque), in Nebish Lake, Wisconsin, Trans. Wisc. Acad. Sci. Arts and Litl., 33: 189-337.

1962. Collection and analysis of commercial fishery statistics in the Great Lakes. Great Lakes Fish Comm., Tech. Report No. 5, 31 p.

Krosch, H F, 1967 Progress Report on the Lake St. Croix Fish Population Study, NSP Environmental Monitoring Program Annual Report, 1967.

1969. 1968 Progress Report on the Lake St. Croix Fish Population Study, NSP Environmental Monitoring Program Annual Report, 1968.

1971. 1970 Progress Report on the Lake St. Croix Fish Population Study, NSP Environmental Monitoring Program Annual Report, 1970.

Mayhew, J, 1973. SHAD, A complete program for computation of age and growth statistics of fish. Iowa State Conservation Commission, Technical Series 73-1.

#### LITERATURE CITED (Continued)

- Peterson, A R, 1975. Personal communication, Minn. Dept. of Natural Resources, Environment Section.
- Priegel, G R, 1969. The Lake Winnebago Sauger. Age, growth, reproduction, food habits and early life history. Tech. Bull. Wisc. Dept. Natural Res. 43: 63p.
- Roundsefell, G A and W H Everhart, 1953. Fishery Science Its Methods and Applications, J Wiley and Sons, Inc., New York, 444 p.
- Scott, W B and E J Crossman, 1973. Freshwater Fishes of Canada. Fisheries Research Board of Canada, Ottawa, Bull, 184.
- Sternberg, R, 1975. Personal communication, Minn. Dept. of Natural Resources, Section of Fisheries.
- Weber, C I, 1973. Biological Field and Laboratory Methods for Measuring the Quality of Surface Waters and Effluents, EPA-670/4-73-001.

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## APPENDICES A through G

Appendix A-Common and scientific names and methods of capture of fish in the Prairie Island area, 1974

			Met	hod of Cap	ture	
Common Name*	Scientific Name*	Trap_net	Gill net	Trawl	Electro-fishing	<u>Seine</u>
Silver lamprey	Ichthyomyzon unicuspis	x	•		x	
Chestnut lamprey**	Ichthyomyzon castaneus**		4			
Lake sturgeon***	Acipenser flavescens***					
Shortnose gar	Lepisosteus platostomus	x	x	x	X	x
Longnose gar	Lepisosteus osseus	x	x		x	
Bowfin	Amia calva	x	x		x	
Mooneye	Hiodon tergisus	x	x	x	x	
Goldeye	Hiodon alosoides	x	x	x		
Gizzard shad	Dorosoma cepedianum	x	x	x	x	х
Bigmouth buffalo	Ictiobus cyprinellus	x	x	x	x	x
Smallmouth buffalo	Ictiobus bubalus	x	x	x	x	x
Carpsucker species	Carpoides species	x	x	x	x	x
White sucker	Catostomus commersoni	x	x		x	
Spotted sucker	Minytrema melanops	x				
Silver redhorse	Moxostoma anisurum	x			x	
Northern or Shorthead redhorse	Moxostoma macrolepidotum	x	x		x	х
River redhorse	Moxostoma carinatum	x				
Carp	Cyprinus carpio	x	x	x	x	x
Silver chub	Hybopsis storeriana			x	x	<b>x</b>
Pugnose minnow	Opsopoeodus emiliae			х	x	
Golden shiner	Notemigonus crysoleucas				x	
Common shiner	Notropis cornutus				x	x
Emerald shiner	Notropis atherinoides			x	x	x
Rosyface shiner	Notropis rubellus				x	x
Spotfin shiner	Notropis spilopterus				x	x
River shiner	Notropis blennius					x
Spottail shiner	Notropis hudsonius			x	x	x
Mimic shiner	Notropis volucellus					x
Blacknose shiner	Notropis heterolepis					x
Brassy minnow	Hybognathus hankonsoni					x
Silvery minnow	Hybognathus nuchalis				x	
Fathead minnow	Pimephales promelas				x	
Bullhead minnow	Pimephales vigilax			x	x	x
Bluntnose minnow	Pimephales notatus				x	x
Channel catfish	Ictalurus punctatus	x	x	x	x	х
Black bullhead	Ictalurus melas	x	x			
Brown bullhead	Ictalurus nebulosus	x	x			
Yellow bullhead	Ictalurus natalis	x	X			x

Appendix A Cont. - Common and scientific names and methods of capture of fish in the Prairie Island area, 1974 (Con't.)

			Metho	od of Capt	ure	
Common Name*	Scientific Name*	Trap net	Gill net	Trawl	Electro-fishing	Seine
Flathead catfish	Pylodictis olivaris	x	· ·		x	
Tadpole madtom	Noturus gyrinus		• •			
Northern pike	Esox lucius	x	x		x	x
American eel	Anguilla rostrata	x				
Trout perch	Percopsis omiscomaycus		•	x		x
White bass	Morone chrysops	x	x	x	x	. x
Yellow perch	Perca flavescens	x	x	x	x	x
Sauger	Stizostedion canadense	x	x	x	x	X
Walleye	Stizostedion vitreum	x	x	x	x	
Log perch	Percina caprodes				x	x
Johnny darter	Etheostoma nigrum					x
Smallmouth bass	Micropterus dolomieui	x	x		<b>x</b>	x
Largemouth bass	Micropterus salmoides	x			x	
Green sunfish	Lepomis cyanellus				x	x
Pumpkinseed	Lepomis gibbosus			x	x	
Bluegill	Lepomis macrochirus	x	x		x	x
Hybrid sunfish	Lepomis macrochirus X?				x	
Rock bass	Ambloplites rupestris	x	x		x	х.
White crappie	Promoxis annularis	x	x	x	. <b>x</b>	X
Black crappie	Promoxis nigromaculatus	x	x	x	x	x
Freshwater drum	Aplodinotus grunniens	x	X	x	x	x
Burbot	Lota lota	x			x	

\*Common and scientific names according to Accepted Common and Scientific Names in American Fisheries Society's Special Publication No. 6 (1970)

**\*\***Captured in the trash basket in the plant screen house

**\*\*\***Caught by a commerical fisherman

	A1	Catch/Lift		Plant Area Catch/Lift	Below Lock & Dam 3 Catch/Lift		
Species	No.	for 20 lifts	No.	for 10 lifts	No.	for 10 lifts	
Silver							
lamprey	-	-	-	<b>-</b> '		-	
Shortnose gar	20	1.00	2	0.20	· •••	e de la compañía de l	
Longnose gar	21	1.05	-		-	<b>–</b>	
Bowfin	2	0.10	-	<b>**</b>	-	<b></b>	
Mooneye	2	0.10		-	-	-	
Goldeye	-	-	-	-	-	-	
Gizzard							
shad	2	0.10	-	-	-	-	
Bigmouth							
buffalo	4	0.20	1	0.10	-	-	
Smallmouth							
buffalo	1	0.05		-		-	
Carpsucker spp.	4	0.20	••• <sub>1</sub>	<b>—</b>	1	0.10	
White sucker	2	0.10	2	0.20	-	-	
Spotted							
sucker	-	-	-	-		_	
Silver							
redhorse	5	0.25	l	0.10	*22	-	
Shorthead							
redhorse	39	1.95	17	1.70	2	0.20	
River				,			
redhorse	1	0.05	-	-	-	-	
Carp	132	6.60	70	7.00	69	6.90	
Channel	-		·	,		•	
catfish	1	0.05	-	-	1 .	0.10	
Black		-					
bullhead	1	0.05	1	0.10	-	_	
Brown		-					
bullhead	-	-		-	-	-	
Yellow							
bullhead	-	-		_	-	-	
Flathead							
catfish	-	-	1	0.10	1	0.10	
Northern pike	40	2.00	-		1	0.10	
American eel	G			<b>e</b> *	-	-	
White bass	217	10.85	30	3.00	64	6.40	
Yellow perch	-	-	้า	0.10	-		
Sauger	26	1.30	5	0.50	2	0.20	
Walleye	10	0.50	3	0.30	2	0.20	
Smallmouth			-				
bass	-	-			-	-	
Largemouth							
bass	-	-	-	<del></del>	-	. 🛥	
Bluegill	1	0.05	1	0.10	1	0.10	
Rock bass	2	0.10	3	0.30	5	0.50	
White crappie	ī	0.05	5	0.50	1	0.10	
Black crappie	22	1.10	-		5	0.50	
Freshwater		~~~~		··· ·	2		
drum	67	3,35	<b>7</b> 0	7.00	148	14.80	
Burbot	~/		-		0	0.10	

Appendix B. (Cont.) Summary of trap net catches by area, summer.

	Abo	ve Plant		Plant Area	Below	Lock & Dam 3
		Catch/Lift		Catch/Lift		Catch/Lift
Speciés	No.	for 20 Lifts	No.	for 10 Lifts	No.	for 10 Lifts
Silver						
Jemprey /	_	_	1	0 10		
Showthogo gon	— Цл	2 05	6	0.10	z	0 70
Longroop gar		2.09	1	0.10	2.	0.00
Longhose gar	9	0.20	1	0.10		~ 70
DOWIIN	0	0.40			. 2	0.50
Goldeve	י <del>ד</del> י ו	0.20	1	0.10	-	
Gordeye	ـلـ ۲	0.05		-		
Gizzard Shad	Ŧ	0.05		-	-	-
bigmouth	2	0.10			•	
	2	0.10	-	-	-	-
Smallmouth					-	o <b>20</b>
buffalo	-	- (-	-	-	2	0.20
Carpsucker spp.	23	0.65	2	0.20		-
White sucker	. 3	0.15			2	0.20
Spotted						
sucker	-	-		-		-
Silver						
redhorse	11	0.55	-	·		_
Shorthead					-	
redhorse	100	5.00	29	2.90	8	0.80
River						
redhorse	-	-	-		-	-
Carp	152	7.60	81	8.10	65	6.50
Channel						
catfish	1	0 <b>.0</b> 5	2	0.20	-	-
Black						
bullhead	-	-	2	0.20	-	-
Brown						
bullhead		-	1	0.10	-	-
Yellow						
bullhead		-	-	**	-	-
Flathead						
catfish	l	0.05	-	<del>,</del>	with	-
Northern pike	36 -	1.80	5	0,50	23	2.30
American eel	1	0.05	-		1	0.10
White bass	146	7.30	12	1.20	24	2.40
Yellow perch	-	-	-		-	-
Sauger	23	1.15			3	0.30
Walleye	11	0.55	1	0.10	2	0.20
Smallmouth					4	
bass			1	0.10	-	' 🕳 '
Largemouth						*
bass	-	-	-	-	1	0.10
Bluegill	10	0.50	2	0.20	1	0.10
Rock bass	6	0.30	3	0.30		-
White crappie	4	0.20	6	0.60	2	0.20
Black crappie	55	2.75	2	0.20	13	1.30
Freshwater			<b>L</b>	्र व स्कुल्य	- <b>-</b>	~~ · · · ·
drum	107	5.35	110	11.00	27	2.70
Burbot		# - # #			÷™ (	

Appendix B. (Cont.) Summary of trap net catches by area, fall.

	Ab	ove Plant	]	Plant Area	Below Lock & Dam		
		Catch/Lift		Catch/Lift	<u></u>	Catch/Lift	
Species	No.	for 20 Lifts	No.	for 10 Lifts	No.	for 10 Lifts	
Silver							
lamprev		-		· <b>-</b>	-	-	
Shortnose gar	58	2.90	1	0.10	1	0.10	
Longnose gar	_		<b>.</b>	· · · · · · · · · · · · · · · · · · ·	1	0.10	
Bowfin	1	0.05		<del></del>			
Mooneve	1	0.05			-		
Goldeve	_						
Gizzard shad	1	0.05	-		-	-	
Bigmouth	-						
huffalo	8	0.40		-		_	
Smallmouth	Ŭ	0.10					
huffalo	2	0 10	1	0.10		1	
Carneucker en	Г Г	0.20	1	0.10	_	, _	
White sucker	ר ו	0.05		0.10	2	0.20	
Snottod sucker	<u>_</u>		_	-	ב ו	0.10	
Sporteu Sucker	-	-			·	0.10	
DITAGL.	<u>ь</u>	0.20			٦	0.10	
reanorse	4	0.20	6147)		Τ.	0.10	
Snorthead	"	7 70	17	1 70	7	0.10	
reanorse	00	5.50	12	1.JU	1	0.10	
River							
reanorse	ć.	7 20	<u>c</u> li	<u>C</u> lio	-	=	
Charp	04	5.20	04	D. HU	- 20	5.00	
	-		-			-	
DIACK	г	0.05	0	0.00			
Dullnead	1	0.05	7	0.70		-	
Drown bullbase			п	0.10			
Dulinead	-	-	, <b>1</b>	0.10	*20		
Iellow			-	0.10			
		-	Ŧ	0.10	-	-	
Flathead	~	0.10			-	0 10	
Catilsh	2	0.10	-	- 10	1	0.10	
Northern pike	12	0.75	<b>1</b>	0.10	T	0.10	
American eel	-		- 10		-		
White bass	315	15.75	47	4,70	23	2.30	
Yellow perch	-		-		-	-	
Sauger	22	1.10	7	0.70	9	0.90	
Walleye	ð	0.40	-	-	4	0.40	
Smallmouth	-						
bass	Ι.	0.05	1825	e	-	-	
Largemouth		4 - P					
bass	•	<del></del> .	-	-		-	
Bluegill	29	1.45	19	1.90	12	1.20	
Rock bass	3	0.15	4	0.40	- 100		
White crappie	5	0.25	2	0.20	2	0.20	
Black crappie	25	1.25	19	1.90	62	6.20	
Freshwater drum	28	1.40	21	2.10	31	3.10	
Burbot	4250			4229	1	0.10	

Total	Short-	Long-					Small-	Carp-	1
Length in	nose	nose	Davida	Magnes	Gizzard	Bigmouth	mouth	sucker	White
Centimeters	der.	gar	Bowiin	Mooneye	shad	buffalo	buffalo	spp.	sucker
	50.	-6ai							
V/V met mooo			+						
I/I not meas.			+	+					+
									<u> </u>
0.1 - 1.9								The second s	
2.0 - 3.9							No. of Concession, Spinster, Spinste		
4.0 - 5.9									
6.0 - 7.9									
8.0 - 9.9				1	1				
			and the second secon			an a	مى يىلى يەرىكى بۇرىكى بۇرىيى تىلىرىلى بەرەر مەرىيە مىكى بىلىكى بىلىكى بىلىكى بىلىكى بىلىكى بىلىكى بىلىكى بىلىكى		
10.0 - 11.7			+					The second s	
12.0 - 13.9			+						
14.0 - 15.9							Para and a second state of the second state of the	فيستعدان المتهوين والأرا	
16.0 - 17.9								1	
18.0 - 19.9		İ	1						
20.0 - 21.9									
22.0 - 23.9									
240 - 25.9			1					1	
260 - 279									
28.0 - 27.0									
20.0 - 29.9					<u> </u>				
30.0 - 31.9									
<u> </u>				2					
34.0 - 35.9			1						
36.0 - 37.9									1
38.0 - 39.9					J	1			
			and the second secon		and the second se	and the state of the			
400 - 44 9			1			<del>م در بر در در در در</del>			
40.0 = 44.9			+						-2
45.0 - 49.9		ļ						<del></del>	
<u> </u>	2								
55.0 - 59.9	0					2 1			
60.0 - 64.9	8						1		
65.0 - 69.9	3								
70.0 - 74.9		13	2		the second s		A CONTRACTOR OF A CONTRACTOR A	1	]
75.0 - 79.9		4				de la factoria de la companya de la			
80.0 = 84.9									
85.0 - 89.9									
90.0 = 94.9									
95.0 - 99.9		1							
100.0 - +			1						1
Adults not meas.						1		~	
		الجري يتكلوا الشاهارة فاليويين معاركم بعد			. 1		and a second		
Total = $Y/Y + A$	22	21	2	2	2	5	t	5	4
			+			+			
مەرىپىيە بۇرە ئەرىپىرىيە رەرىپىرىيە يېرىپىرى ئېرىيەت رەرىپەر تەرىپىدىغان ئەرىپەر تەرىپىدىغان ئەرىپەت تەرىپەر	an a			<b> </b>		<del>~ ~ +</del>	-	an and a second s	
		a de Cara a como de com			+++++++++++++++++++++++++++++++++++++++		<u> </u>		and the second
and a second									
	-	and a state of the second s							The set of
						1	1	<u> </u>	
						1			
						and the second second second	A		

## Appendix B Cont. - Length-frequency of fishes caught in trap nets, spring

Appendix B	Cont	Length-frequency	7 of	fishes	caught	in trap	nets	.spring	(Cont.)	)
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Total	Silver	Short-		Т	<u> </u>	Flat-	1		·
Length in	red-	head	ł	Channel	Black	head	Northern	White	Yellow
Centimeters	horse	redhorse	Carp	Catfish	Bullhead	catfish	pike	bass	perch
			Service and the service of the servi						
Y/Y not meas.			an a						
and the second secon				+					
0.1 - 1.9									
2.0 - 3.9			مىلىكى بولىكى مىكى يەرىيى بىلىدى مەركى بىلىكى ب مەركى بىلىكى ب		and Participant Street and Street Street			a a a a a a a a a a a a a a a a a a a	<u> </u>
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6.0 - 7.9				+					
8.0 - 9.9				+				ومعالوا الكورية بسائل المتناف المتكور	
10.0 - 11.9									
12.0 - 13.9									
<u>14.0 - 15.9</u>				+					
16.0 - 17.9								and the second secon	
18.0 - 19.9			<u></u>		-				
20.0 - 21.9			4						
22.0 - 23.9									
24.0 - 25.9			7					-2	
20.0 - 27.9		<u> </u>						0	
28.0 - 29.9		┝━╧						-1.7	
30.0 - 31.9		<u> </u>	- <u>/</u>		محمد به مربع معرف المارية المارية المربعة المربعة المربعة المربعة المربعة المربعة المربعة المربعة المربعة الم	and the state of the		42	
32.0 - 33.9						a Windowski Alikanija overs			
<u> </u>	وي موسط والتروية بين المراجع ا	0	10			-		01	
36.0 - 37.9		10	10		and the second			47	
38.0 - 39.9	and the second		9					28	
100		1 100	70	<del>۲ ۱</del>			~ 1	- 1	{
40.0 - 44.9		17	29	<u>↓</u>					
45.0 - 49.9	7		<u> </u>		-				
55.0 - 59.9	2		22				4		
<u> </u>	<u> </u>		40	+		ر وسطيماكين كوسترد منيم المحك	$\frac{2}{2}$		
65.0 = 69.9			<u>4</u>				4		
70.0 - 74.9	alwaran inge-pittinan ingin		<u> </u>	<u> </u>					
75.0 - 79.0	a Januar ang		2				<del>4</del>		
75.0 = 79.7				<u> </u>			4 +		
			المراجع كالمحارك فالمالي فالمتحا	<u> </u>			<u> </u>		
-000 - 040	والمساورة الشائر ومحمودها والمراجع	<u> </u>	ىرىپچىت <u>ىن كەرچىيە سەرىپارە</u> دەتتەتتە	<u> </u>			2		
95.0 = 99.0				<u>├</u>				+	
$\frac{39.0}{100.0} = \frac{39.7}{100.0}$				<u> </u>					
10000 - 4				┟────┤			<del></del>		
Adults not meas	o		<u>о</u>	<u> </u>	┈╌┼				
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				<u>├</u>		<del></del>			{
			معدنة ليجروها بالشعد إرجاعها						
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				<u>├</u> ────┤			<u> </u>		
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	and the second			L	, , , , , , , , , , , , , , , , , , ,	<u> </u>		Shington and statements	

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Total				Pools	White	Black	Tresn-		
Length in	0			NOCK	whitce	DIACK .	water.		
Centimeters	Sauger	walleye	blueg11	Dass	crappie	crappie	arum	Burbot	
Y/Y not meas.									
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0.1 - 1.9									
2.0 - 3.9					a a a a a a a a a a a a a a a a a a a				
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10.0 - 11.9							-	THE OWNER WATER COMPANY	
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16.0 - 17.9				3		6		a fragman and the second s	
18.0 - 19.9				3		2	1		
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22.0 - 23.9						3	17		
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26.0 - 27.9		an a	an a	anna a tha ann an tha a	ىرىنى <u>مەرىمە بەرمەر مەرمەر بەرمەر بەرمە</u>	7	46	an a	
28.0 - 29.9	2		Contract of the local division of the local		2	3	40 1	t i	
30.0 - 31.9	10			an a	2		41		j
32.0 33.0	-10	2		Construction operation of the second states					
32.0 = 33.9		<u> </u>		and the second secon			- 20	<u>+</u>	
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36.0 - 37.9							_27		
38.0 - 39.9					L		13	Terrate state of the second state of the secon	
		and the second							
40.0 - 44.9	3	1					5		
45.0 - 49.9	1	5		1				,	
50.0 - 54.9		5					1	l.	
55.0 - 59.9		1				Construction of the second	and the second secon	Ī	
60.0 - 64.9		and the second					1		
65.0 - 69.9				and the second secon			السف حديث المستحد والتك	are subjective and the subject of th	
70.0 - 74.9				والمراجعة فيستنهد بسناد مستاعلاتك					i
75.0 - 79.9				analogian Selambia dan municipalitati					
80.0 - 84.9									
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90.0 = 94.9	and the second second second	in a substant of the		anan di Kalanda di Kana yang di Kana	and a subsection of the subsection of t		a na sa		
97.0 - 99.9									
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Adults not meas.			T	1		1			
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### Appendix B Cont. - Length-frequency of fishes caught in trap nets, spring (Cont.)

## Appendix B Cont. - Length-frequency of fishes caught in trap nets, summer

Total	1	Short-	Long-	1	ſ	T		Big-	Carp-
Length in	Silver	nose	nose	Į			Gizzard	mouth	sucker
Centimeters	lamprey	gar	gar	Bowfin	Mooneye	Goldeye	shad	buffalo	spp.
Y/Y not meas.									
0.1 - 1.9									
2.0 - 3.9									
4.0 - 5.9									ور معالم معالم المحالي المحالي المحالي المحالي المحالي
6.0 - 7.9									
8.0 - 9.9			the company of the constraints		and all in cases. If the same in successful the				
10.0 - 11.9									
12.0 - 13.9									
14.0 - 15.9	L		Construction of the local division of the lo						4
16.0 - 17.9					, 				3
18.0 - 19.9			an all of our subscription (b)			Concernation of the local data in the local data			
20.0 - 21.9									3
22.0 - 23.9									
24.0 - 25.9									Contraction of the second second
26.0 - 27.9					-	and the second statement of			
28.0 - 29.9									
<b>30.0 -</b> 31.9					2				
32.0 - 33.9					2				
34.0 - 35.9		1			1				
36.0 - 37.9						1			
38.0 - 39.9									
				A design of the second s					l
40.0 - 44.9									
45.0 - 49.9		1	and the second secon	2				2	X
50.0 - 54.9		8	and the second	1					
55.0 - 59.9		24		3					2
60.0 - 64.9		14		4					
65.0 - 69.9		2			and the second secon			ومعر المزاد والمالي فسال	
70.0 - 74.9		<u> </u>	3	11					
75.0 - 79.9		ويرون والمروان والم	1						
80.0 - 84.9			and the second distance of the second distanc	L		1			
85.0 - 89.9			1					-	
90.0 - 94.9		-		<u> </u>		ļ.	******		the second local diversion of the second diversion of the se
95.0 - 99.9		و من السري من الموالي							
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Adults not meas.	1	1	National States and the second second						
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			and the state of the						]
1997 - Andrew State and State a					J	L			

Total			Τ	Τ	Small-	Large-			1
Length in	American	White			mouth	mouth		Rock	White
Centimeters	eel	bass	Sauger	Walleye	bass	bass	Bluegil1	bass	crappie
37 / 17			+	+					
I/I not meas.						Company of the State Street of the State			
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6.0 - 7.9									
8,0 - 9.9									
10.0 - 11.9	· · · · · · · · · · · · · · · · · · ·								
12.0 - 13.9									
14.0 - 15.9						,	2	.5	4
<u> 16.0 - 17.9</u>		6					4	<u> </u>	2
18.0 - 19.9	ļ	3				┝───	4		+
20.0 - 21.9		2	+				3		
22.0 - 25.9		<u> </u>			<u>+</u>				
24.0 - 27.9		7		+	<u>-</u>		<u> </u>		2
28.0 - 29.9		5		+	<del>_</del>				+
30.0 = 31.9		10	2						+÷
32.0 = 33.9		39	6			الي ديند منصالير جيني — اليديني من الم		ر میں بنایا ہے جس پر انجاب سے 1997 میں ا	
34.0 - 35.9		63	4						
36.0 - 37.9		33	6	Ē					
38.0 - 39.9		10	2						
		المراجع المراجع المراجع المراجع				-			
40.0 - 44.9		2	5	11					
45.0 - 49.9	<b></b>		_	<u> </u>					
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Appendix B Cont. - Length-frequency of fishes caught in trap nets, summer (Cont.)
# Appendix B Cont. - Length-frequency of fishes caught in trap nets, summer (Cont.)

Total			Short-		and the second		¢e	Flat-	I
Length in	White	Silver	head		Channel	Black	Brown	head	Northern
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Appendix B Cont. - Length- frequency of fishes caught in trap nets, summer (Cont.)

# Appendix B Cont. - Length-frequency of fishes caught in trap nets, fall

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Total	<b>**</b>		Short-		1			1	
Length in	Spotted	Silver	head		Black	Brown	Yellow	Flathead	Northern
Centimeters	sucker	redhorse	redhorse	Carp	bullhead	bullhead	bullhead	catfish	pike
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Appendix B Cont. - Length-frequency of fishes caught in trap nets, fall (Cont.)

ppendix B Cont	Length-frequency of	' fishes caught in t	trap nets, fall (Cont.)
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Total Length in Centimeters	White bass	Sauger	Walleye	Small- mouth bass	Bluegill	Rock bass	White	Black crappie	Fresh- water drum
		ala mana Managana							
Y/Y not meas.									
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10.0 - 19.9	27	+	┝╼╼╼╧╼╼╼╼┥	an a		<del>_</del>	<u> </u>		<u></u>
20.0 - 21.9	27		┢╍╍╍╍┥	7	£	an a	<u>↓</u>	18	<u></u>
22.0 - 25.9	12		<u> </u>	t	a ang ang ang ang ang ang ang ang ang an			<u>+0</u>	0
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Appendix B Cont. - Length-frequency of fishes caught in trap nets, fall (Cont.)

	Abo	ove Plant	P1	ant Area	Belc	w Lock & Dar	n_3
		Catch/Hour		Catch/Hour		Catch/Hour	
Species	No.	(7.5 Hours)	No.	(2.5 Hours)	No.	(2.5 Hours)	<u>)</u>
Silver lamprey		-	-	-	-	-	
Shortnose gar	2	0.27	4244	-	545	-	
Longnose gar	-	623	125	-	-		
Bowfin	1	0.13				-	
Mooneye	3	0.40	***		-	-	
Goldeye	-	-	-			-	
Gizzard shad	-	20	1	0.40	<b>eu</b>		
Bigmouth buffalo	3	0.40	2	0,80	4	1.60	
Smallmouth buffalo	-	-	-	40°	1	0.40	
Carpsucker spp.	62	8.27	3	1.20	1	0.40	
White sucker	-	<b>a</b>			2	0.80	
Silver redhorse	2	0.27			1	0.40	
Shorthead							
redhorse	53	7.07	. 17	6.80	24	9.60	
Carp	214	28.53	152	60.80	73	29.20	
Silver chub	24	3,20	2	0,80			
Pugnose minnow	_		-			-	
Golden minnow		_	ı	0.40		·	
Common shiner			-		-	_	
Emergld shiner	28	3 73		_	2	0.80	
Desuface shiner	10	1 33			. 2	0.80	
Spotfin shinon	10	10 <i>)</i>	-	_	2	-	
Spottin Shiner	-	-		0_40	· _	_	
Spottall Billier		-	÷.	0.40	_	_	
Silvery minnow	-	-	-	-		_	
Fathead minnow		^ 17		-		-	
Bullhead minnow		0.15				-	
Bluntnose minnow	2	0.40		1 60			
Channel catfish	6	Ų.0U	4	T.00	Ŧ	0.40	
Flathead catfish	-		***	-	, <b>*</b> *	2.00	
Northern pike	5	0.67	T T	0.40 L 90	5	2.00	
White bass	76	10.13	12	4.80	97	38.80	
Yellow perch	3	0.40	-	-		-	
Sauger	36	4.80	8	3.20	30	12.00	
Walleye	7	0.93	1	0.40	17	6.80	
Log perch	-	-	-		ent?	-	
Smallmouth bass	20	2.67	3	1.20	9	3.60	
Largemouth bass		-	1	0.40	80	-	
Green sunfish	2	0.27	-	-	-	<b>.</b>	
Pumpkinseed	-	<b>e</b> .	3	1.20		640 1	
Bluegill	15	2.00	5	2.00	17	6,80	
Hybrid sunfish	-	-	· 🚽	-	800		
Rock bass	17	2.27	8	3.20	45	18.00	
White crappie		-	-	-	l	0.40	
Black crappie	2	0.27	1	0.40	6	2.40	
Freshwater drum	68	9.07	11	4.40	25	10.00	
Burbot	-		-	-		-	

# Appendix C - Summary of day electro-fishing catches by area, spring

Appendix C Cont. - Summary of day electro-fishing catches by area, summer

	Abo	ve Plant	P	lant Area	Belo	w Lock & Dam 3
		Catch/Hour		Catch/Hour		Catch/Hour
	No.	(7.5 Hours)	No.	(2.5 Hours)	No.	(2.5 Hours)
Silver lamprev	-			_	-	-
Shortnose gar	-	-	3	1.20		-
Longnose gar	-	_	í	0.40		
Bowfin	2	0,27	-	-		. <b>.</b>
Mooneve	-	-	-	-	٦	0.40
Goldeve	· _	-	-	-		~
Gizzard shad	140	18.67	152	60,80	54	21.60
Bigmouth buffalo	1	0.13	1	0.40	5	2.00
Smallmouth buffalo	2	0.27	6	2.40	í	0.40
Carnsucker son	27	3.60	2	2.80	<u>ī</u>	1.60
White sucker	-	<b>J</b> .00	, -	-	_	1.00
Silver redhorse	_	-	_		_	-
Showthead redborse	23	3.07	18	7 20	20	8.00
Comp	130	18 53	101	48 40	67	26.80
Silver chub	10	2 57	121	2 00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	20.00
Durnese minnew	19	2.00		2.00	<u> </u>	0.00
Goldon minnow		-	-	-	<b>.</b>	-
Correr chiner			-	-		-
Common Shiner	- 	· 777	-	0.80	16	6.10
Dereface shires	27	2.22	2	7.00	10	0.40
Rosylace shiner	0	1.07	0	2.20	4	1.00
Spotiin sniner	-	- 	-	-		-
Spottall sniner	4	0.55	<b>•</b>	-		. 🗖
Silvery minnow	-	-	-			-
Fathead minnow	-		Ţ	0.40	-	-
Bullhead minnow	2	0.27	2	0.80	-	-
Bluntnose minnow	-		-	-		-
Channel catfish	4	0.53	24	9.60	4	1.60
Flathead catfish	1	0.13	2	0,80	1	0.40
Northern pike	2	0.27	-	-0.1	4	1.60
White bass	69	9.20	96	38.40	112	44.80
Yellow perch	8	1.07	6	2.40	-	
Sauger	32	4.27	18	7.20	25	10.00
Walleye	6	0.80	-	-	9	3.60
Log perch	5	0.67	5	2.00	3	1.20
Smallmouth bass	27	3.60	21	8.40	27	10.80
Largemouth bass	-	-	1	0.40	5	2.00
Green sunfish	1	0.13	41	16.40	3	1.20
Pumpkinseed	-	-	-			-
Bluegill	25	· 3.33	252	100.80	202	80.80
Hybrid sunfish	-	-	3	1.20	. 3	1.20
Rock bass	2	0.27	54	21.60	34	13.60
White crappie	-	-	1	0.40	-	· 🛥
Black crappie	4	0.53	11	4.40	6	2.40
Freshwater drum	76	10.13	76	30.40	12	4.80
Burbot	-	<b>-</b>	1	0.40	2	0.80

ана стана стан Стана стана стан	Ab	ove Plant	Pla	ant Area	Below Lock & Dam		
/	10000	Catch/Hour	Hild Country Allows	Catch/Hour	Analysis of Barrieller	Catch/Hour	
Species	No.	(7.5 Hours)	No.	(2.5 Hours)	No.	(2.5 Hours)	
Silver lamprey	-	-	-		2	0.80	
Shortnose gar	3	0.40	-	-	-	-	
Longnose gar	ĩ	0.13		-	-	-	
Bowfin	-		-	-	-	-	
Mooneye	2	0.27	-	-	-	-	
Goldeye			-	-	-	-	
Gizzard shad	540	72.00	388	152.20	100	40.00	
Bigmouth buffalo	-	-	-	-	-	-	
Smallmouth buffalo	-	-		-	· 🛶	-	
Carpsucker spp.	9	1.20	600		-	-	
White sucker	ź	0.27	-	-	1	0.40	
Silver redhorse	-	-	-	-	-		
Shorthead redhorse	בר	1-47	6	2.40	7	2.80	
Carp	96	12.80	35	14.00	181	72.40	
Silver chub	25	3,33	6	2.40	2	0.80	
Purnose minnow	3	0.40	-		-	_	
Golden minnow	_	-	-	-	-		
Common shiner	٦	0.13		_	-	-	
Emerald shiner	6	0.80	ſ	0-40	2	0.80	
Rosyface shiner	3	0.40	3	1,20	-	-	
Spotfin shiner	í	0.13			_	_	
Spottail shiner	16	2.13	4	1_60	1	0 40	
Silvery minnow	ĩ	0.13	-	1000	-	-	
Esthead minnow	-		_	_		_	
Bullbard minnow	3	0 40	10	4 00		_	
Bluntnose minnow	2	0.27	10	-	_	-	
Channel catfish	2	0.27	1	0 40	<u> </u>	1 60	
Flathead catfish	-	0127	1	0.40	-	1.00	
Northern nike	ц Ц	0 53		-	5	2 00	
White base	47	6 27	16	640	41	16 40	
Vellow nench	7	0.03	3	0,00	1	0 40	
Sources	2	0.93	2	0.80	Å	3 20	
Walleva	15	2.00	2	0.80	15	6.00	
Log ponch	1	0.53	1	0.00		0.40	
Englimenth pass	36	4 80	יי רו	4 40	ъĹ	5.60	
Langemouth bass	<u> </u>	4.00		2.40	25	10.00	
Groon sunfish	-	1 47	50	20,00	2) Q	3 60	
Dumpkingood	**	<b>T</b> •+/	<u> </u>	20.00	-	J.00	
Rungill	52	6.07	<b>z</b> 4.2	176 80	275	110 00	
Bruegili Diuegili	<u>כ</u> ר ו	0.99	272	190.00	275		
Pook boss	0 T	1 20	5	20 80	1 1	5 60	
White energie	צ ירו	1 40	92 10	20.00	74	9.00	
Block crappie	14 14		12	7.00 z 60	- - /.		
Drack crappie	10	6 27	7	2.00	14 2		
Purbat	47	0.21	. <b>H</b>	T.00	2	0.00	
DUPDOU	-	-		-			

Appendix C Cont. - Summary of day electro-fishing catches by area, fall

		ove Plant	P1	ant Area	Tailwaters Lock & Dam 3		
		Catch/Hour		Catch/Hour		Catch/Hour	
Species	No.	(5 Hours)	No.	(1.25 Hours)	No.	(1.25 Hours)	
Silver lemnrev	_	_	_	_		<b>_</b>	
Shortnose gar	- - 	0.60	_	· •	_		
Longnose gar	í	0.20	_	-	_	-	
Bowfin	-	-	_			<b>-</b>	
Mooneve	1	0.20		-			
Goldeve	_				_	· •	
Gizzard shad	386	77,20	252	201.60	22	17.60	
Bigmouth buffalo	_	-			••••		
Smallmouth buffalo	-	-	-	-	-	-	
Carpsucker spp.	5	1.00	-	-	-	-	
White sucker	2	0.40	_	-	_	-	
Silver redhorse	_		-	60a	-	-	
Shorthead redhorse	9	1.80	3	2.40	3	2,40	
Carp	69	13.80	15	12.00	86	68,80	
Silver chub	20	4.00	3	2.40	2	1.60	
Pugnose minnow		0.60	-		-	-	
Golden shiner	-	-	-	-		-	
Common shiner	1	0,20	-	=	-	-	
Emerald shiner	5	1.00	-	-	<b>100</b>	444	
Rosyface shiner	3	0.60	2	1.60	-	<del>***</del>	
Spotfin shiner	ī	0.20	<b>K</b> 2	-	-	-	
Spottail shiner	5	1.00	1	0,80	1	0.80	
Silvery minnow		-		-	-	-	
Fathead minnow	-	-		1990.		-	
Bullhead minnow	3	0.60	4	3.20	**	-	
Bluntnose minnow	2	0.40	(inter-	-	-		
Channel catfish	2	0.40	1	0.80	1	0.80	
Flathead catfish	-	-			3	2.40	
Northern pike	2	0.40		<b>.</b> .	-	-	
Trout perch	-	-	-	••••		-	
White bass	23	4.60	3	2.40	23	18.40	
Yellow perch	4	0.80	2	1.60	1	0.80	
Sauger	3	0,60	2	1.60	8	6.40	
Walleye	12	2.40	1	0.80	10	8.00	
Log perch	4	0.60	1	0.80	***	-	
Smallmouth bass	34	6.80	6	4.80	2	7.20	
Largemouth bass	-	-	1	0.80	7	5.60	
Green sunfish	1	0.20	17	13.60	3	2.40	
Pumpkinseed	-	-		-	( -		
Bluegill	2	0.40	1,44	115.20	62	49,60	
Hybrid sunfish	-		1	0.80		- 00	
Rock bass	5	1.00	17	13.60	1	0.80	
White crappie	ļ	0.20	1	0.80	-		
Black crappie	6	1.20	3	2.40	5	4.00	
Freshwater drum	24	4.80	1	0,80	1	0.80	
Burbot	-	-	-		-	-	

Appendix C. Cont - Day electro-fishing catches from selected stations by area, fall

Appendix C Cont. - Night electro-fishing catches from selected stations by area, fall

				~	Pole	V. Tools 9 De	
	AL	pove Plant	<u>م</u>	lant Area	Delo	W LOCK & Da	
		Catch/Hour		Catch/Hour		Catch/Hou	r
Species	No.	(5 Hours)	 No.	(1.25 Hours)	No.	(1.17 Hour	<u>'s)</u>
Silver lamprey	-	· · ·	-		-	-	
Shortnose gar	-	-	-		-		
Longnose gar	-		-	400	-	-	
Bowfin	1	0.20		-		<b></b> .	
Mooneye	6	1.20	1	0.80	2	1.71	
Goldeye	-	-	-			-	
Gizzard shad	116	23.20	97	77.60	1	0.86	
Bigmouth buffalo	1	0.20	1	0.80	-	<b>-</b>	
Smallmouth buffalo	1	0.20	· •	-	-		
Carpsucker spp.	19	3.80	3	2.40	16	13.71	
White sucker	-	-			2	1.71	
Silver redhorse	1	0.20	_		2	1.71	
Shorthead redhorse	21	4.20	5	4.00	29	24.85	
Carp	74	14.80	31	24.80	37	31.70	
Silver chub	98	19.60	6	4.80	45	38,56	
Pugnose minnow	_			-	_	-	
Golden shiner		·	-	-	-	-	
Common shiner	-	-	-	-		_	
Emerald shiner	2	0.40	1	0.80	-	-	
Rosvface shiner	7	1.40	2	1.60	3	2.57	
Spotfin shiner	-				_		
Spottail shiner	16	3,20	-		-	-	
Silvery minnow		-	· •••	-	-	-	
Fathead minnow		-		<b>e</b>	-	-	
Bullhead minnow	3	0.60	1	0.80		-	
Bluntnose minnow	_					· _	
Channel catfish	6	1.20	٦	0,80	r	0.86	
Flathead catfish	-					-	
Northern pike	-		-	-	3	2.57	
Trout perch	٦	0,20	<b>100</b>	-	_		
White bass	100	20,00	40	32,00	59	50, 56	
Yellow perch	4	0.80	้า	0.80		,,.	
Sauger	אר	3.60	5	4.00	99	84.83	
Walleve	30	6.00	3	2.40	23	19.71	
Log nerch	)ů	0.20	_	2810			
Smallmouth bass	ž	0.60		2 40	-		
Largemouth bass		0.00	_	2:10	- 1	0.86	
Green sunfish		0_60	-	_	-	0.00	
Pumpkinseed	_		_	-	-		
Bluegill		0_60	46	36.80	10	8 57	
Hybrid sunfich	_	. 0.00			10	0.)/	
Rock bass	- 1	0.20		2.40	- ג	2 57	
White crannie	-	0.20	ر _	L. TU	ر _	L•)(	
Black crannia		-	2	1 60	5	<u> </u>	
Freshwater drum	85	17 00	5	4.00	17	14 57	
Burbot	-	±/•00			± ( _		

Total	Short-		1		Big-	Small-	Carp-		1
Length in	nose			Gizzard	mouth	mouth	sucker	White	Silver
Centimeters	gar	Bowfin	Mooneye	shad	buffalo	buffalo	spp.	sucker	redhorse
								[	
Y/Y not meas.									
1/1 not meas.					· · · ·				1
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# Appendix C Cont. - Length-frequency of fishes caught by day electro-fishing, spring

Total	Short-		7	1	1	T T	1	10.11	<b>b</b> 1
Length in	bead		Silver	Golden	Francia	Doorfoo	Cuattai	Bull-	Blunt-
Centimeters	nedborco	Com	ship	abinon	chinard	ROSYIAC	opottal.	nead	nose
	r canor be	Varp		Gurner	i bittiner	Burner	samer	mi nnow	minnow
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10.0 - 11.9	8								
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Appendix C Cont. - Length-frequency of fishes caught by day electro-fishing, spring (Con't.)

	<del>,</del>	T		<u> </u>	7	<b>.</b>	10	IT a second	1
Total		Neuthern	1.71-2.4.	Valla			Small-	Large-	L
Length in	umannel	Northern	white	Terrow			mouth	mouth	Green
Centimeters	catfish	pike	bass	perch	Sauger	Walleye	bass	bass	sunfish
	<u> </u>						<u></u>		+
Y/Y not meas.	ļ								
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20.0 - 21.9			1		2	5	5		
22.0 - 23.9			2		4	2	2		
24.0 - 25.9					5	1	1		
26.0 - 27.9			4		4	1	3		
28.0 - 29.9			3		7	2	4		
30.0 - 31.9			10		2	1	2		
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Appendix C Cont. - Length-frequency of fishes caught by day electro-fishing, spring (Cont.)

Total Centimeters         Pumpkin- seed         Rock         white crappie         Black         Freeh- water           Y/Y not meas.	term of the state	and the second secon							-	
Length in Centimeters         Pumpkin- aged         Rock Bluegil bass         White crappie         Black crappie         water drum           0.1         1.9	Total			1			Fresh-			
Centimeters         ged         Bluegil bass         crappie         crappie         drum           Y/Y not mens.	Length in	Pumpkin		Rock	White	Black	water			
IVY not meas.         IVY not meas.         IVY not meas.           0.1         1.9         1         1           4.0         5.9         1         1         1           6.0         9.9         14         10         1         1           12.0         7.9         1         4         10         1         1           6.0         9.9         18         3         1         4         15         12           12.0         15.9         2         12         1         12         16         11         15         12           14.0         15.9         2         12         1         12         16         14         12	Centimeters	seed	Bluegil	hace	crappie	crappie	drum	1		
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36.0 - 37.9       7         38.0 - 39.9       7         40.0 - 44.9       7         45.0 - 49.9       7         55.0 - 59.9       2         60.0 - 64.9       7         65.0 - 69.9       7         75.0 - 79.9       7         80.0 - 34.9       7         90.0 - 94.9       7         95.0 - 99.9       7         100.0 - +       1         100 - 1       1	34.0 - 35.9						4			
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40.0 - 44.9       7         45.0 - 49.9       7         50.0 - 54.9       2         55.0 - 59.9       2         60.0 - 64.9       2         65.0 - 59.9       2         70.0 - 74.9       7         75.0 - 79.9       2         80.0 - 84.9       3         90.0 - 94.9       3         95.0 - 39.9       3         95.0 - 39.9       3         95.0 - 39.9       3         100.0 - +       4         Adults not meas.       4         101 - Y/Y+A       3         37       70       1         9       104		and the second secon	an a		ومراها المتحدين وسيتي والمنابع والمراجع والمراجع والمراجع والمحاطية والمحاطية والمحاطية والمحاطية والمحاطية وا	an a suit ann an an ann an an an an an an an an a	an a	and the second secon		
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70.0 - 74.9				an parte de la company de la company					·	
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80.0 - 84.9       1       1       1         85.0 - 89.9       1       1       1         90.0 - 94.9       1       1       1         95.0 - 99.9       1       1       1         100.0 - +       1       1       1         Adults not meas.       4       1       1         Total = Y/Y+A       3       37       70       1       9       104	75.0 - 79.9								ļ	
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100.0 - +       Image: Constraint of the second se	95.0 - 99.9					T				S.
Adults not meas.       4         Total = $Y/Y+A$ 3         37       70       1       9       104         100       100       100       100       100         100       100       100       100       100         100       100       100       100       100         100       100       100       100       100         100       100       100       100       100         100       100       100       100       100         100       100       100       100       100	100.0 - +								1	
Adults not meas.     4       Total = Y/Y+A     3       37     70       1     9       104					T					
Total = Y/Y+A 3 37 70 1 9 104	Adults not meas.			۵۵۵۵۲۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵۵			4			
Total = Y/Y+A         3         37         70         1         9         104	and a second			Dersterne optigenigen og	11			-		
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					<u> </u>				-	
								and the second secon		

Appendix C Cont. - Length-frequency of fishes caught by day electro-fishing, spring (Cont.)

Total	Short-	Long-	T	l	I	Γ	Small-	Carp-	Short-
Length in	nose	nose	1		Gizzard	Bigmouth	mouth	sucker	head
Centimeters	gar	gar	Bowfin	Mooneye	shad	buffalo	buffalo	spp.	redhorse
				I				·	
Y/Y not meas.		1	[	[	l				
		1							1
0.1 - 1.9									
2.0 - 3.9					10				
4.0 - 5.9	ha na mangang ng kang kang kang kang kang kang	an a	1		13			1	
6.0 - 7.9				and the second	31		,	and the state of the local division of the l	3
8.0 - 9.9					44	ant and an eff of the Constructor and		4	
10.0 - 11.9					86		and the second secon	and the second secon	
120 - 13.9					61	and a standard state of the sta	2000 (011		
14.0 - 15.9			tera an All Contraction Street and Contraction Streets	a yang di sanah da kata da yang da sa sa kata da	1	anakatapang Praké Salah Sa		7	1
160 - 179							and an opposite of the second seco	6	8
18.0 - 19.9	a de la companya de l				a Prograf grant and a sign of the charged		angerigt af Fille State Billion som for your	2	10
20.0 - 1).)		and the second	+			and the second secon	an a charge d'air an an San San San San San San San San S	7	4
220.0 - 23.0			+		1		3	2	
210 - 250					and the state of the			<u>с</u>	
260 - 279						anananan afartertara ara a		2	
20.0 - 27.9		han the second s				and the second second	<u> </u>	a and a support of the second seco	
20.0 = 29.9	a disease in the Constant of States of St					a na ang ang ang ang ang ang ang ang ang	anna a tha ann an tha ann an tha ann an tha ann an tha ann ann an tha ann ann an tha ann ann an tha ann ann an	يعادلون ويعارفون والتكاثر وكويريم	<u>-</u>
30.0 = 31.9			+						
<u> </u>		<u> </u>							
74.0 - 55.9			+		Charles and the second s				
$-\frac{50.0}{79.0}$	·								
<u> </u>		L			Land and the second				4
			1 7	<u> </u>				1	
40.0 = 44.9				┝┥	a antari da cana ana ana ana ana ana ana ana ana a	<u> </u>			
45.0 - 49.9		+	<del>_</del>	┝─────┿┝┥					<u> </u>
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50.0 - 59.9	<u> </u>			L	nyana manganananjara separa sa				
65.0 69.0	<u> </u>								
09.0 - 09.9		<u> </u>							
70.0 - 74.9									
75.0 - 79.9		<u> </u>	+			í			]
00.0 - 04.9				└ <u>───</u> ↓'					
05.0 - 09.9						) •••••••••••••••••••••••••			and the second designment of the second design
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95.0 - 99.9	and a subscription of the			<u> </u>					and the second
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Appendix C Cont. - Length frequency of fishes caught by day electro-fishing, summer

NOT Place Concerns to a Concerns to back the second state of the second state of the second state of the second								-	
Total			1		1		Small-	Large-	
Length in	Northern	White	Yellow			Log-	mouth	mouth	Green
Centimeters	pike	bass	perch	Sauger	Walleye	perch	bass	bass	sunfish
	-		No. of Concession, Name	-			and the second secon		1
V/V not mono			+	<u> </u>	+				+
I/I not meas.	f				+		and the second		+
									-
<u>·0.1 - 1.9</u>				<u> </u>		a hand any first the state of the	+	<u> </u>	+
2.0 - 3.9				Carecolation of Carecolation o				ļ	$\frac{1}{1}$
4.0 - 5.9		5	2						16
6.0 - 7.9		54	8		1		2		3
8.0 - 9.9		98		4			1		8
10.0 - 11.9		8.	1	14	5		1 1	1	6
12.0 - 13.9			3	8	1	Contraction of Contra	3	1	7
14.0 - 15.9		2		1		and the second secon	6	1	3
160 - 179		17				alaren arrietarren arrietarren arrietarren arrietarren arrietarren arrietarren arrietarren arrietarren arrietar	18	1	1
180 - 100		28					12		+
		20							+
20.0 - 21.9				<u> </u>		and the second secon	+ <u> </u>		
22.0 - 23.9				0	<u></u>		+		
24.0 - 25.9	a	2		<u></u>		-	0	1	
26.0 - 27.9				<u> </u>	Ļ		5	1	
28.0 - 29.9		1 /		2			2		
30.0 - 31.9		2		2			4		
32.0 - 33.9	1	4	I	1			4		
34.0 - 35.9		15	1	3		and the second secon	2		
36.0 - 37.9		11		<u>г</u>		ala managada kata kata sa sa Sas	2	and the second	
$\frac{1}{380} - \frac{1}{390}$		<u> </u>					+	and the second secon	
		Contraction of the Contraction o	J	12	ليستعيمها		and the second	angalan ngagangangan dina manggangan	
100 1110	<u> </u>	7	1		1		1		
40.0 - 44.9	<u></u>					والمراجعة والمتحدي المتحاطين والمراطقة		and the second	
<u>45.0 - 49.9</u>			+	<u> </u>				بري بيان من وقاة الإنتسانية الألبان	ļ!
50.0 - 54.9	2		<u> </u>					a na ka di ka dana ya si di ki di Kana ya s	
55.0 - 59.9						فالومع والمائلة فيطرعونهما			
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75.0 - 79.9					Ĩ	a na	1	And the second	
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90.0 - 94.9		and and an and an arrival of the		and the second secon		بالجين المراجع الأفريجين الم			
95.0 - 99.9	<u> </u>	ىرى مۇيىلىنى سىرىي بېرىكى <del>قارانى</del>	†		<u> </u>	ىلە <del>ر بىلەر يەر ئە</del> تىرىكى بىلەر تەتتەر بىلەر تەتتەر			
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Appendix C Cont.- Length frequency of fishes caught by day electro-fishing, summer (Cont.)

			1	r	Snot-	7	+	h	T
Total		Silver	Emerald	Rosyfood	tail	Fathand	Bullhood	Channel	Flathard
Length in	Com	chub	chinor	abiron	china-	minnow	DULTING	onamer	r tatnead
Centimeters	oarp	Chub	Burner	surner.	shiner	minnow	minnow	catiisn	catiisn
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I/I not meas.									
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4.0 - 5.9	2		1		an a				and the second
6.0 - 7.9	adament to the second		adan Wannan - Antainan Sirandaran	and an analogue and an an angle of processing and an analogue of the second second second second second second	anna a cana ann an Arta ann an Arta an		an a	anterestation angles and been been as a probability of the balance of the balance of the balance of the balance	
8.0 - 9.9	4								
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14.0 - 15.9									
16.0 - 17.9									1
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22.0 - 23.9	1								
24.0 - 25.9	2								
26.0 - 27.9	6			an particular a subscription of the subscripti		ويجواح الله وماستونوس فندواه			
28.0 - 29.9	8	Contraction of the local division of the loc							
30.0 - 31.9	17			a an				2	1
32.0 - 33.9	12					a a su com a contra su com a f		3	
	20			The second s	and and the second s	والمرابعة والمرابعة والمرابعة		6	and the second
<u> </u>	21		a a substant de companya a statutat	laglaces in the age of the second strike opposition is	alimate doolegeng disate provident Spectral	and the second secon	and the state of the	4	
	12	]	<u> </u>			-		4 !	1
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40.0 - 44.9	63	Ļ						10	{
45.0 - 49.9	90	ļ	a series de la desta de la competencia	ومتخد المحدوقة والمركب المتراج	-				
50.0 - 54.9	47								and a state of the
55.0 - 59.9	14	+							
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Appendix C Cont.- Length frequency of fishes caught by day electro-fishing, summer (Cont.)

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					and a second	 			
Total				/	T	Fresh-		T	
Length in		Hybrid	Rock	White	Black	water			
Centimeters	Bluegill	sunfish	bass	crappie	crappie	drum	Burbot		
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I/I not meas.				+					
01 - 10				+		+		+	
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$\frac{2.0}{4.0} = 5.9$	13		7		<del> </del>	10	+	<u> </u>	+
60 70	36		6		<u></u>	47		+	
80 00	121	2	27			21	+	+	+
10.0 - 11.9	236	<u> </u>	13		and the second difference of the second differ	2		+	
10.0 - 11.9	36				6				+
12.0 - 10.9	24		14	<del> </del>		7	+	<u> </u>	+
14.0 = 19.9	6		12	+	<u>}</u>	19	+	+	+
10.0 - 17.9	<u> </u>		5	+	7	13	+	+	
10.0 - 19.9					2		<u> </u>	<del> </del>	
20.0 - 21.9				+			<u> </u>		
22.0 - 23.9			مرمد <sub>اعل</sub> ی بر استان می و استان می و استان م			<u> </u>			+
24.0 - 27.9			ومكاوره ويرجز والكالة ويروي ويتروك	<u>}</u>	2	$\frac{2}{12}$	+		+
20.0 - 27.9			استان ومورد ومعالية الباري وستانات		<u> </u>		+		
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<u> </u>						<u> </u>			
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<u> </u>				<u> </u>		<u> </u>	<u> </u>		
36.0 - 37.9			and the second distance of the second se			<u> </u>	<u> </u>		<u> </u>
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		and the second		J	agention the second second second	<u> </u>	1	1	······
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45.0 - 49.9						<u> </u>	+		
50.0 - 54.9			-						
<u> </u>			المالا بيستوملك فكفار مسراويتها						
60.0 - 64.9						an a			
02.0 - 09.9									
70.0 - 74.9					أوري معادلة معالية في معادمة من ا			مىرىيىتى بىرىكى تىرىيى بىرىكى تىرىپىيى مىرىيىتى بىرىيى بىرىكى تىرىپىيى بىرىكى تىرىپىيى بىرى	
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00.0 - 04.9			المحدوسة بالمحدية		and the second	-			
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90.0 - 94.9			المعاودة الفناورتي المروسوس						
95.0 - 99.9	· · · · · · · · · · · · · · · · · · ·		and the second secon						
100.0 = +			and the second states						
			and the second secon	·				وبر الأعاد المركبة المحد والمحادث والمح	
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			فستتبسر فينصلون يستورجون وتراكل				1		<b> </b>
Total = Y/Y+A	579	6	90		21	164	3		
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a an			and the second secon			ومترجع وتعارفهم والمراجع		and the state of the	
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Appendix C Cont. - Length frequency of fishes caught by day electro-fishing, summer (Cont.)

	·		77	T	7	14			and the second secon
Total		Snort-	Long-			Carp-		Short-	
Length in	Silver	nose	nose	1	Gizzard	sucker	White	head	
Centimeters	Lamprey	gar	gar	Mooneye	shad	spp.	sucker	redhorse	Carp
			1	T		1			
Y/Y not meas.			T		917		T	1	Hereitersbergen und "Stradtardung
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			+			<u>}</u>	-	++	ومن في الم المراجع في المستحد المتحدث المعال
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2.0 - 3.9							+		and the state of the
4.0 - 5.9				4					
6.0 - 7.9					4				and the second secon
8.0 - 9.9			ļ		34	2		5	new with constraints on any
10.0 - 11.9	L		1	1	41		<u>i</u>	2	
12.0 - 13.9					20				
14.0 - 15.9					5		1 1		
16.0 - 17.9				T	3	1	1	Ι	
18.0 - 19.9	1	}	1				1	1	
20.0 - 21.9	h	ويرود الكراب اليواطن ويستعادو				7	1	2	
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20.0 - 27.9					1940 - Standard Constanting	L		<u> </u>	
28.0 - 29.9			┝──┶						
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32.0 - 33.9	I			2	2				2
34.0 - 35.9									5
36.0 - 37.9	T				and the second	n an		4	9
38.0 - 39.9	1			1	and the second se	and the second secon	1		7
and the second	1			and the state of the second		adyrand a statistic basediersky, my	and the second		
40.0 - 44.9						9		7	75
450 - 49.9			1						
50 0 54.9		and the second				2			
55.0 - 59.9	+			+		6			
<u> </u>		<u> </u>				and the second secon			<u> </u>
60.0 - 64.9									24
65.0 - 69.9		1							4
70.0 - 74.9			1					and the second	2
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80.0 - 84.9									
85.0 - 89.9	l		[	T					and the second se
90.0 - 94.9	Γ			1					
95.0 - 99.9		i a a a a a a a a a a a a a a a a a a a			ann an		and a second		
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			Construction of the local division of the lo	أبعصمها		<u> </u>	an a		Carl and the second

Appendix C Cont. - Length-frequency of fishes caught by day electro-fishing, fall

Ax	pendix	С	Cont.	-	Length	frequency	of	fishes	caught 1	by	dav	electro-fishing.	fall	(Cont.)
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Total	a a a a a a a a a a a a a a a a a a a	1		<u> </u>	1		T	1	1
Length in	Silver	Pugnose	Common	Emerald	Rosyface	Spotfin	Spottail	Silvery	Bullhead
Centimeters	chub	minnow	shiner	shiner	shiner	shiner	shiner	minnow	minnow
Conservative and the second									
Y/Y not meas.									
0.1 - 1.9									
2.0 - 3.9			I						
4.0 - 5.9									
6.0 - 7.9				and the second					
8.0 - 9.9							مري سنار ماند بسري معري		
10.0 - 11.9					and the second	and the state of the		والمراجع المراجع	
12.0 - 13.9	and the second design of the		and the second secon						
14.0 - 15.9	and the supervised in	-	and the second s		ang mang mang kang di kang kang kang kang kang kang kang kang	Activate Contracting of the Contraction of the Contraction of the Contraction of the Contraction of the Contract	وللمطور في ومن والمراجع المراجع المراجع المراجع المراجع	مرد به مرد	
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22.0 - 23.9		ant of the state o				ada <u>mping ing ang a</u> gaing ang sa			
24.0 - 25.9									
26.0 - 27.9						ور و المراجع ا			
28.0 - 29.9	ورومقستوست ومرور بتستجد تر		and the second secon		and the second secon				
30.0 - 31.9					and the second				
32.0 - 33.9		ļ							
34.0 - 35.9	في معرفة الألفانية المحدود المحالي الم								
<u> </u>		and the state of the		-		and the second			
38.0 - 39.9					No. of Concession, name				
		r		i					<sup>p</sup>
40.0 - 44.9									
<u>45.0 - 49.9</u>			and the second secon		والمحاذرين والمتعادة الاستيمين ومل				
50.0 - 54.9									
55.0 - 59.9			and the second		and the second			<del></del> +-	
60.0 - 64.9		and the second	and and and an and an and a second		and the second		-		
70.0 = 09.9	and the second secon							anna an	
70.0 = 74.9	an a		the second state of the second						
75.0 = 79.9	استخاره الكالي وزور ومكاور و								
85.0 - 89.9			and the second design of the s						
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							+		
100.0 - 100.0	يوسي معاداته المالي								and an a second s
	ىرىنى بەتىرىتىك ئىل <sub>ى</sub> تىرىنى بىرىنى بىرىنىڭ تاتىمىر							aliti di maine <sup>an</sup> Charmysiana pinto <sup>a</sup> liti	anna a tairt fa fan an a
Adults not meas.	33	3				1	21	<del>+</del>	z
			┝────┤	2			<u> </u>		2
Total - $Y/Y+A$	33	3		9	6	1	21		
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and a second	·	and the local design of th							
						Contraction of the second s	and the second secon		and the second se

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Total	Blunt-		Flat-			T			
Length in	nose	Channal	head	Northerr	White	Vallow			Log
Centimeters	minnou	ontfich	neau optfich	nike	hage	nench	Saurer	Wallowa	nonch
activiting for to	I III IIIIOW	CALITON	CAULTON	DINE	VABB	iberch.	Dauger	Warreye	perch
V/V not mass					anna an				
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20 - 3.9			angelanderit tertinder ander an			+			
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6.0 - 7.9				and the second	and the state of the	1			
8.0 - 9.9			and the second second second second		16	8			
10.0 - 11.9			ylanniane (592,000,000,000,000,000,000,000,000,000,0	ten milling Column to Colorodo	48				
12.0 - 13.9					15	1	2		
14.0 - 15.9			na ann an Annaichtean Annaichtean Annaichtean Annaichtean Annaichtean Annaichtean Annaichtean Annaichtean Annai			1	6		· 1
16.0 - 17.9							1	6	
18.0 - 19.9								4	
20.0 - 21.9	1		1		12	1	2	1	
22.0 - 23.9					5		1		
24.0 - 25.9		-			1		2		
26.0 - 27.9			ananan ar an						
28.0 - 29.9									
30.0 - 31.9							1	1	
32.0 - 33.9					3				
34.0 - 35.9					1			1	
36.0 - 37.9					3				
38.0 - 39.9									
									1
40.0 - 44.9		3					2	8	
45.0 - 49.9		1			and the second secon			3	
50.0 - 54.9		2		1				3	
55.0 - 59.9				2	a a construction of the second se				
60.0 - 64.9		1	an and an	3	وببيوين ستختشوه ويوبسون			1	
65.0 - 69.9				1				3	
70.0 - 74.9	L					ļ;		1	
75.0 - 79.9			and the second	1	in an				
80.0 - 84.9					in an				
85.0 - 89.9	-								
90.0 - 94.9					an minang mangang manang ma		<del></del>		
95.0 - 99.9					ومحمد بالمعرف والمعام				
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Adults not meas.	2	and the second	and the second secon		n-ara alabamata ang				6
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Appendix C Cont. - Length frequency of fishes caught by day electro-fishing, fall (Cont.)

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Longth in	sularr-	mouth	Green		Hybrid	Pook	White	Block	rresn-
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Appendix C Cont. - Length-frequency of fishes caught by day electro-fishing, fall (Cont.)

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Total	1			Big-	Carp-			Snort-	
Length in			Gizzara	mouth	sucker	white	Silver	nead	
Centimeters	Bowiin	Mooneye	snad	buffalo	spp.	sucker	redhorse	redhorse	Carp
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<u> 18.0 - 19.9</u>					3			7	
20.0 - 21.9		1			3			5	
22.0 - 23.9					4		1	8	
24.0 - 25.9					4			1	1
26.0 - 27.9				1	8			1	1
28.0 - 29.9					2			2	1
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Appendix C Cont. - Length-frequency of fishes caught by night electro-fishing, fall

Appendix C Cont. - Length-frequency of fishes caught by night electro-fishing, fall (Cont.)

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Length in	Silver	Emerald	Rosyface	Spottail	head	Channel	Northern	Trout	White
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Appendix C

Cont. - Length-frequency of fishes caught by night electro-fishing, fall (Cont.)

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Appendix C

Cont. - Length-frequency of fishes caught by night electro-fishing, fall (Cont.)

			A STATE OF THE OWNER	الدحلي فليتكم المكروسيين الكرية المتنافذين		and a second		-	
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Centimeters	crappie	drum			No. of Concession, Name				
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10.0 - 11.9		25	1				T	1	
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		SPRI	NG		FALL				
	Ab	ove Plant	I	Plant Area	A	bove Plant		Plant Area	
Species	No.	Catch/Lift (for 20 Lifts)	No.	Catch/Lift (for 5 Lifts)	No.	Catch/Lift (for 20 Lifts)	No.	Catch/Lift (for 5 Lifts)	
Shortnose gar	21	1.05	6	1.20	. 58	2.90		-	
Longnose gar	19	0.95	_	-	2	0.10	-	-	
Bowfin	1	0.05	-	-	2	0.10	-	-	
Mooneve	2	0.10	-	-	7	0.35	_	-	
Goldeve	_	-	-	-	4	0.20	2	0.40	
Gizzard shad	1	0.05	1	0.20	602	30,10	117	23.40	
Bigmouth buffalo	2	0.10	_		1	0.05		-	
Smallmouth buffalo	_		-	-	14	0.70	2	0.40	
Carpsucker spp.	1	0.05	-	-	-	· · · · ·	ī	0.20	
White sucker	1	0.05	-	<b>-</b> .	1	0.05	-	-	
Shorthead redhorse	34	1.70	6	1.20	27	1.35	9	1.80	
Carp	112	5.60	37	7.40	110	5.50	12	2.40	
Channel catfish	7	0.35	1	0.20	18	0.90	6	1.20	
Black bullhead	i	0.05	-	-	-	-	-	-	
Brown bullhead	-	-		-	1	0.05	-	-	
Yellow bullhead	-	<b>-</b> .	-	-	-	-	1	0.20	
Northern pike	17	0.85	6	1.20	19	0 <b>.9</b> 5	4	0.80	
White bass	38	1.90	16	3.20	249	12.45	45	9.00	
Yellow perch	-	-	-	-	6	0.30	9	1.80	
Sauger	96	4.80	9	1.80	140	7.00	31	6.20	
Walleye	18	0 <b>.9</b> 0	1	0.20	37	1.85	2	0.40	
Smallmouth bass	l	0.05	1	0.20	-	-	-	-	
Bluegill	-	-	-	<b>.</b>	1	0.05	-	· · · · · · · · · · · · · · · · · · ·	
Rock bass	2	0.10	4	0.80	2	0.10		-	
White crappie	1	0.05	1	0.20	18	0.90	8	1.60	
Black crappie	5	0.25	4	0.80	26	1.30	8	1.60	
Freshwater drum	13	0.65	2	0.40	21	1.05	1	0.20	

Appendix D - Summary of gill netcatches by season and area, 1974

Total	Short-	Long-	1.			Big-	Carp-	I	Short-
Length in	nose	nose	Baufin	Maanawa	Chad	mouth	sucker	White	head
Centimeters	gar	gar	DOWIIN	Mooneye	Snad	bullato	spp.	sucker	rednorse
V/V not mono									
1/1 not meas.								terreter and a second second second second second second second second second second second second second secon	
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26.0 - 27.9		and the state of the state of the state of the state of the state of the state of the state of the state of the		a Dalah kacamatan pangangan sa sa sa sa sa sa sa sa sa sa sa sa sa	a Anna an ann an		a and a substantian spectra of the spectra of the spectra of the spectra of the spectra of the spectra of the s	ورجي واستخدار المتحد المتحد المتحد	
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	and the second second second second second second second second second second second second second second secon	and the second designed of the second designe	Automation - Automation of				and the second se	k	
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### Appendix D Cont. - Length frequency of fishes caught in gill nets, spring

Total		Channel		Nouthous	White	T		Small-	De ele
Length in Continutons	Carn	Catfish	plack	nike	white	Saugar	Walleve	mouth	ROCK
Gentimeters	Varp	Catilish	Durineau	pike	0455	Dauger	"arreye	Vabb	Vabb
V/V not meas			+			+		in the Property of the Print	
I/I not meas.				and the second second second second second second second second second second second second second second second					<u> </u>
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4.0 - 5.9									
6.0 - 7.9									
8.0 - 9.9									
10.0 - 11.9				and the second second second second second second second second second second second second second second second	-			Militaria formation and a failed and failed	
12.0 - 13.9					3	ļ	and a set of the second diversion of the second diversion of the second diversion of the second diversion of the	1	2
14.0 - 15.9	3				2				1
16.0 - 17.9					<u>· 1</u>				<u> </u>
18.0 - 19.9	9				ويستقد ومعاورها ومراجع				
20.0 - 21.9	<u> </u>		a and a second state of the second state of th	and the second second second	a a construction of the second second second second second second second second second second second second se		<u> </u>	<u></u>	
22.0 - 23.9	<del>(</del>	and the second design of the second design of the second design of the second design of the second design of the			Sherida and a second statement of the second second second second second second second second second second se	2		<u>۲.</u>	
24.0 = 27.9	<u> </u>		and the second second second second second second second second second second second second second second secon	and the second second second second second second second second second second second second second second secon	2	6		The second second second second second second second second second second second second second second second s	
20.0 = 27.9					<u>ے۔۔۔</u> ۱	5		وي جار من التي المراجع الم	
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32.0 - 33.9	22		and the property line of the local distance		20	11			
34.0 - 35.9	12				14	10		and the state of the second second second second second second second second second second second second second	1
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40.0 - 44.9	11	5				22	3		
45.0 - 49.9	7	1				8	4		
50.0 - 54.9	4			5		2	3		
55.0 - 59.9	3			3					
60.0 - 64.9				7				and a standard program with and and	
65.0 - 69.9		and the state of the second state of the secon	-	2					
70.0 - 74.9	and an other states of the sta	alogical and the state of the state	and the state of the state of the state of the state of the state of the state of the state of the state of the	2				and the second second second second second second second second second second second second second second secon	
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$\frac{00.0 - 07.9}{85.0 - 89.9}$									
90.0 = 94.9					and a spin-spin-spin-spin-spin-spin-spin-spin-				
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					ور بی میروند میرود.				

# Appendix D Cont. - Length frequency of fishes caught in gill nets, spring (Con't.)

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Total			Fresh-				1 .		1 · · ·
Length in	White	Black	water						
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Centimeters	crappie	crappie	urum						
			فيعتبون والمتعادية المتعادية والمتعاد						
Y/Y not meas.		1							
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4.0 - 5.9									
6.0 - 7.9					1		1		
8.0 - 9.9					1		1		1
10.0 - 11.9	7	5	ويستخدما بمعترف ويهوي متكسا الي		1		1	1	
10.0 - 11.7	<u> </u>		2		+		+		+
12.0 - 15.9			<u>د</u>	and the second second second second second second second second second second second second second second second					
14.0 - 15.9	والمتكاف المتعاد فالمتكافي ورساله والت						i 		
16.0 - 17.9		2			<u> </u> .		1		
18.0 - 19.9							1		
20.0 - 21.0			والمرجمية بريميكي وموادي والم		n a de la company de la contra de la company de la contra de la contra de la contra de la contra de la contra d		1	1	
			3	<u> </u>	+	+	+	1	
22.0 - 23.9			<u> </u>	and the second second second second second second second second second second second second second second secon	+		4	<u> </u>	
24.0 - 25.9			2						
26.0 - 27.9			2						
28.0 - 29.9			1						
30.0 - 31.9							T	1	
32.0 33.0	and the second second second second second second second second second second second second second second secon		2		a series and the second second second second second second second second second second second second second se			1	
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38.0 - 39.9									
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40.0 - 44.9			المريقية بيكرين كالمستعامية بإيكان	المت اور بال المان التي والمتحدث. ا	1	The second second second second second second second second second second second second second second second s			1 Y
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55.0 - 59.9							1		
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Appendix D Cont. - Length frequency of fishes caught in gill nets, spring (Con't.)

Total	Short-	Long-	1				Big-	Small-	Carp-
Length in	nose	nose					mouth	mouth	sucker
Centimeters	gar	gar	Bowfin	Mooneye	Goldeye	Shad	buffalo	buffalo	spp.
Y/Y not meas.	an an an an an Alian The State State State					590			
	a and a second state of the providence of the pr					and the second second second second second second second second second second second second second second second			
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4.0 - 5.9					alan di Manetala Sangarana pad	and a subscription of the			
6.0 - 7.9	and the second second second	a and a state of the state of the state of the state of the state of the state of the state of the state of the	4			An an an an an an an an an an an an an an			
8.0 - 9.9			<u> </u>						
10.0 - 11.9			+			0			
12.0 - 13.9			4			47			
14.0 - 15.9			-	No. of Concession, Name					
16.0 - 17.9				and the second se		25			
10.0 - 19.9						2	and a substant of the substant	antina di antina paga paga paga paga paga	
20.0 - 21.9		+		the second second second second second second second second second second second second second second second s	an an an an an an an an an an an an an a	al dense These any paragraphic sectors and			
22.0 - 23.9		n a hang pangahan 2 antida ya Kanadana			an ang ta mangli di ang pinang kanalang kanalang kanalang kanalang kanalang kanalang kanalang kanalang kanalang	and the state of the state of the state of the state of the state of the state of the state of the state of the	an managa man Tanan Samani Manani ang mangang mangang mangang mangang mangang mangang mangang mangang mangang m		
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20.0 = 27.9			+			L			
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30.0 - 31.9	and the standard providence of the standard providence of the standard providence of the standard providence of					ት 		<u>L</u>	
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-34.0 - 37.9									
$-\frac{90.0}{79.0}$		<u> </u>	+	7		<u> </u>			
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40.0 - 44.9			2	2	1	4	alan kaana ka maraka ka maraka ka maraka ka maraka ka maraka maraka maraka maraka maraka maraka maraka maraka m	<u> </u>	
45.0 - 49.9	and the second second second second second second second second second second second second second second secon	n Staar oo saa saa ka	1			1			
50.0 - 54.9	an an an an an an an an an an an an an a						1		
55.0 - 59.9	23				1				
60.0 - 64.9	27	1	1						
65.0 - 69.9	6		1					1	
70.0 - 74.9	1						1		
75.0 - 79.9							an an an an an an an an an an an an an a		
80.0 - 84.9				Contraction of the second second second second second second second second second second second second second s	1				
85.0 - 89.9									
90.0 - 94.9									
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Appendix D Cont. - Length frequency of fishes caught in gill nets, fall

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Total		Short-							1
Length in	White	head		Channel	Brown	Yellow	Northern	White	Yellow
Centimeters	sucker	redhorse	Carp	catfish	bullhead	bullhead	l pike	bass	perch
V/V not moor									
I/I not meas.				+				-	
			-	4					
0.1 - 1.9									
2.0 - 3.9									
4.0 - 5.9									
60 - 29									
						ويرب المري مرتبة اليور ما ال		7	
0.0 - 9.9				+					
10.0 - 11.9									
12.0 - 13.9				L	والمراجع أحديهم مترافع فيرز أحجا أأحفه			10	1
14.0 - 15.9								2	3
16.0 - 17.9					•				2
18.0 - 19.9								3	1
20.0 - 21.0		1		1				31	1
20.0 = 21.3								- 21	
22.0 - 23.9									<sup>±</sup>
24.0 - 25.9								10	i
26.0 - 27.9		1			1			4	
28.0 - 29.9		1	4					2	
30.0 - 31.9		1	8					6	· · · · ·
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			15				_ <u></u>	<u> </u>	
36.0 - 37.9			<u> </u>	2					
<u></u>			>	2				20	
40.0 - 44.9	1	10	23	9				2	
45.0 - 49.9		7	18	4				2	
50.0 - 54.9			7	1 1			4		
55 0 = 59 0			<u>/</u>	+				······	
				<u> </u>			<u> </u>		
60.0 - 64.9			<u>_</u>	<u> </u>					
65.0 - 69.9			and the second second second second second second second second second second second second second second second				4		
70.0 - 74.9							1		
75.0 - 79.9							1		
80.0 - 84.9				1				ي بي ميري کار منطق ميري مي مراجع ميري کار ميري ميري ميري ميري ميري ميري ميري مي	······
85.0 - 89.9				<u>†</u> †					
	·····			t		+			
		<u> </u>	ومعرفات ومعاقلي	<u> </u>					
92.0 - 99.9			and the second second second second second second second second second second second second second second secon	<u> </u>				a mana internetica Main Prangela	
$100^{\circ}0^{\circ} - +$			ووسيستعر ومتحالها وسيستع	L					
Adults not meas.				I	T	1			
	<del>بدر مان رود می است.</del> •					1			
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	بالاگر محمد الارد بر بالاهی با			<u> </u>					
			و مناقل ورود مارد				<u> </u>		
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	and the second second second second second second second second second second second second second second secon						1	and the second design of the second design of the second design of the second design of the second design of the	
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Appendix D Cont, - Length Frequency of fishes caught in gill nets, fall (Con't.)

Total		}	1 1				rresh-		
Length in			1	Rock	White	Black	water		1
Centimeters	Sauger	Walleve	Bluegill	bass	crannie	crannie	drum		1
		1.0210,00			PLAPPIC	prappic		and and the second second	
Y/Y not meas.		and the second second second second second second second second second second second second second second second				Constant Constant Constant	and the second second second second second second second second second second second second second second secon		
						<u>L</u>			
0.1 - 1.9									
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Appendix D Cont. - Length frequency of fishes caught in gill nets, fall (Con't.)

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	SPRING					SUMMER				FALL			
	North Lake		Plant Area		Nor	North Lake		Plant Area		North Lake		Plant Area	
Species	No.	Catch/Hr. (14 min.)	No.	Catch/Hr. (29 min.)	No.	Catch/Hr. (14 min.)	No.	Catch/Hr. (18 min. 25 sec.)	No.	Catch/Hr. (11 min. 10 sec.)	No.	Catch/Hr. (28 min. 5 sec.)	
										= -(			
Shortnose gar	-	-	-	-	-	-	-	-	Ţ	5.26	-	-	
Mooneye	-	-		-	-	-	5	16.13	-	-	-	-	
Goldeye	-	-	-	-	-	-	2	6.45	-	-	-	-	
Gizzard shad	-	-	-	-	114	495.65	-	-	124	652.63	25	53.19	
Bigmouth buffalo	-	-	-	-	-	-	-	-	-	-	2	4.26	
Smallmouth buffal	o 1	4.35	-	-	1	4.34	1	3.23	-	-	4	8.51	
Carpsucker spp.		-	-	-	-	-	-	-	1	5.26	-	-	
Carp	1	4.35	14	29.17	2	8.69	15	48.39	1	5.26	19	40.26	
Silver chub	11	47.83	7	14.58	2	8.69	2	6.45	1	5.26	12	25.53	
Pugnose minnow		-		-	-	-	10	32.26	-	-	-	-	
Emerald shiner	-	-	1	2.08	3	13.04	-	-		42.11	-	-	
Spottail shiner	8	34.77	_	-	_		-	-	<sub>ייי</sub> 5. ר	5.26	-	-	
Bullhead minnow	_	-	-	-	1	4.34	-	_	-	-	-	-	
Channel catfish	-	_	ı	2-08	- 5	21.74	20	64.52	_	_	2	4 26	
Madtom (tadpole)	-	_	1	2.08	_				_	_	ī	· 2.13	
Trout perch	2	8 69	2	4 17	10	43 48	37	110 35	8	42 11	6	12 77	
White hass	2	8 69	-		55	230 13	2	6 45		21 05	ı ı	2 17	
Vallow perch	<i>C</i>	0.09	_	_	2	8 60	2	0.4	т.	21.0)		2.1)	
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Waller	-	8.60		2 08	-	-	2	9.00	-	10 57	1	2.15	
Blue	2	0.09	T	2.00		-	-	-	2	10.55	Ŧ	2.15	
bluegili	-	-	-	-	-	-	-	-	2	10.55	-	-	
white crappie	1	4.55	_		66	200.90	-	-	127	666.42	2	4.26	
Black crappie	1	4.55	1 al	2.08	10	45.68	3	9.68	_7	36.84	1	2.13	
Freshwater drum	4	17.39	24	50.00	37	160.87	492	1587.10	51	268.42	74	157.45	

### Appendix E - Summary of trawl catches by season and area, 1974

Total	Small-				Spot-				
Length in	mouth		Silver	Emerald	tail	Channel	Tadpole	Trout	White
Centimeters	buffalo	Carp	chub	shiner	shiner	catfish	madton	perch	bass
				and the second second second second second second second second second second second second second second second					
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38.0 - 39.9					an an an an an an an an an an an an an a				an an an an an an an an an an an an an a
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Appendix E Cont. - Length-frequency of fishes caught by trawling, spring
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Total					Fresh-	1.1			
Length in			White	Black	water	(	Į.	[ · · · ]	
Centimeters	Sauger	Walleye	crappie	crappie	drum	·····			
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Appendix E Cont. - Length-frequency of fishes caught by trawling, spring (Cont.)

Total Length in			Gizzard	Small- mouth		Silver	Pugnose	Emerald	Bull- head
Centimeters	Mooneve	Goldeve	shad	buffalo	Carp	chub	minnow	shiner	minnow
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18.0 - 19.9					and and a state of the state of				
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70.0 - 74.9			an de antier en antier de la constante en antier en antier en antier en antier en antier en antier en antier e			and the second second second second second second second second second second second second second second secon	an an an an an an an an an an an an an a	and the second second second second second second second second second second second second second second secon	
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Appendix E Cont. - Length-frequency of fishes caught by trawling, summer

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Total	l		1		1		t i	Fresh-	
Length in	Channel	Trout	White	Yellow		White	Black	water	
Centimeters	catfish	nerch	hase	nench	Saugar	anannia	amannia	drum	
	Catilon	percu	0800	IDELCU.	Nauger	Crappie	crappre		۲۰ میرونی میکرد. ۲۰ میرونی میکرد بالای میکرد میگرید است.
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8.0 - 9.9			1						
10.0 - 11.9								1	
12.0 - 13.9							2		
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16.0 - 17.9			1	1			-	6	
18.0 - 19.9			1				1	1	
20.0 - 21.9		1	1						
22.0 - 23.9	<u> </u>							2	
24.0 - 25.9									
260 - 270			<u> </u>						
28.0 - 27.9	<del> </del>								
<u>20.0 - 29.9</u>	+								
30.0 - 31.9					<u>+</u>				
<u> 22.0 - 22.9</u>			{		· · · · · · · · · · · · · · · · · · ·	<del>`````````````````````````````````</del>			
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measurea	22	47		<u> </u>					{
									nanderer in our and a sub-
TOTALS	25	47	57	2	3	66	13	529	

Appendix E Cont. - Length-frequency of fishes caught by trawling, summer (Cont.)

Total Length in	Short- nose	Gizzard	Big- mouth	Small- mouth	Carp- sucker		Silver	Emerald	Spot- tail
Centimeters	gar	shad	buffalo	<b>buffa</b> lo	spp.	Carp	chub	shiner	shiner
			•		و میں اور اور اور اور اور اور اور اور اور اور				
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2.0 - 3.9									
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14.0 - 15.9		1			والمحاجبة المتحركي والمراجع				
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18.0 - 19.9		1		and the second second second second second second second second second second second second second second secon	an dia manggapan pangan di kana di kana di kana di kana di kana di kana di kana di kana di kana di kana di kan Na kana di kana di kana di kana di kana di kana di kana di kana di kana di kana di kana di kana di kana di kana				
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24.0 = 25.9	and and the state of the state of the state of the state of the state of the state of the state of the state of		an an an an an an an an an an an an an a	n na second de la company de la company de la company de la company de la company de la company de la company d T	A NEW YORK CONTRACTOR OF THE OWNER OWNER OWNER	and the second second second second second second second second second second second second second second secon	- air an an an thair an an an an an an an an an an an an an		
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TOTALS	1	149	2	4	1 1	20	.13	8	11

## Appendix E Cont. - Length-frequency of fishes caught by trawling, fall

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Appendix E Cont.		Length-freq	uency o	f	fishes	caught	by	trawling,	fall	(Cont.)	)
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Total			[		a na sa				
Length in	Channel	Tadpole	Trout	White				White	Black
Centimeters	catfish	madtom	perch	bass	Sauger	Walleve	Bluesill	crannie	crannie
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0.0 - 1.0			and the second second second second second second second second second second second second second second second	<u> </u>			and the second design of the second design of the second design of the second design of the second design of the		
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6.0 - 7.9	2			<u> </u>			and the second se	43	
8.0 - 9.9				<u></u>				<u>5</u>	
10.0 - 11.9				2					
12.0 - 13.9									
14.0 - 15.9	L								3
<u> 16.0 - 17.9</u>						2		2	
18.0 - 19.9							المراونين والمتحدين المتحدين المتحدين		
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30.0 - 31.9		and the second design of the second design of the second design of the second design of the second design of the					and the second second second second second second second second second second second second second second second	and the second second second second second second second second second second second second second second secon	
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70.0 - 74.9							·		
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80.0 - 84.9							and the second second second	Normal Surger Control	
<u> 85.0 - 69.9</u>									
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40.0 - 44.9									
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measured									
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TOTALS	115								

Appendix E Cont. - Length-frequency of fishes caught by trawling, fall (Cont.)

Total		Short-	× .			Small-	Large-		
Length in	Gizzard	head	White			mouth	mouth		White
Centimeters	shad	redhorse	bass	Sauger	Walleve	bass	bass	Bluegill	crappie
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0.0 - 1.9									
2.0 - 3.9					an an an an an an an an an an an an an a			2	
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6.0 - 7.9	1		3					18	14
8.0 - 9.9	5	4	14	3	and the second second second second second second second second second second second second second second secon	8	4	111	9
10.0 - 11.9	37	10	64	11	5	8	10	154	5
12.0 - 13.9	32	9	48	6		10	4	125	4
14.0 - 15.9	8	18	37	15		15		62	6
16.0 - 17.9	4	13	32	31	8	23		33	18
18.0 - 19.9	4	11	32	15	7	19	6	14	20
20.0 - 21.9		7	<u>71</u>	16	11	10	5	10	6
22.0 - 23.0	1	8	52	16		13	3	10	
24.0 25.9		5	25	15	4	11	2		<u>ь</u>
26.0 - 27.9	1	10	18	22	2	11	and the second second second second second second second second second second second second second second secon		7
28.0 - 29.9	1	8	18	28	6	8	2		<u> </u>
30.0 - 31.9	8	18	69	34	10	- Ř	1		4
32.0 - 33.9	3	18	160	36	7	, g			7
34.0 - 35.9		35	237	46		<u>lı</u>			
36.0 = 37.9	3	50	157	41		2			
38.0 - 39.9	3	52	62	47	8				and the second second second second second second second second second second second second second second secon
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40.0 - 44.9	6	122	17	90	24				
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50.0 - 54.9		8		a	22	and the second descent of the second descent descent descent descent descent descent descent descent descent d	a a a a a a a a a a a a a a a a a a a		
55.0 - 59.9			and the second second second second second second second second second second second second second second second		8				
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65.0 - 69.9	and the state of the state of the state of the state of the state of the state of the state of the state of the				2	and the state of the state of the state of the state of the state of the state of the state of the state of the	an an an an an an an an an an an an an a	ada manaka da manaka Manaka da manaka da ma	
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TOTALS	118	485	1119	531	179	160	38	538	98

## Appendix F - Length-frequency of fishes used for scale samples in the Prairie Island vicinity, 1974

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12.0 - 13.9	23	22		· · · · · · · · · · · · · · · · · · ·					
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14.0 - 19.9		1.5							
16.0 - 17.9		45							
18.0 - 19.9	46	47		· · ·					
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# Appendix F Cont. - Length-frequency of fishes used for scale samples in the Prairie Island vicinity, 1974 (Con't.)

Total Length in Centimeters	Short- nose gar	Long- nose gar	Gizzard shad	Short- head redhorse	Carp	Silver chub	Emerald shiner	Rosy- face shiner	Bull- head minnow
		<u> </u>	+						
			+						
0.0 - 1.9									
2.0 - 3.9			3						· · · ·
4.0 - 5.9			13		1				
6.0 - 7.9	1.1.1		25						
8.0 - 9.9			9				l		
10.0 - 11.9			8						
12.0 - 13.9			5						
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18.0 - 19.9			1						
20.0 - 21.9			1			میکار <u>ی می اندانیور می از کار</u>	· · · · · · · · · · · · · · · · · · ·		
22 0 - 23 9			1						
240 - 250			+	[					
260 - 270		<u> </u>	+					-	
20.0 - 27.9			+						
20.0 - 29.9			+						
<u> </u>		<u> </u>	<u> </u>		3				
32.0 - 33.9		ļ			12				
34.0 - 35.9		ļ			7				
36.0 - 37.9		<u> </u>	ļ		19			and the second second second second second second second second second second second second second second secon	and the second data in the secon
38.0 - 39.9	L	L	L		11				
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40.0 - 44.9				3	11	and the second second second second			
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60.0 - 64.9			1		1	a da ang ang ang ang ang ang ang ang ang an		an an an an an an an an an an an an an a	
65.0 - 69.9						,			
70.0 - 74.9									
75.0 - 79.9						and the state of the state of the state of the state of the state of the state of the state of the state of the			
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TUTALS			63	6		3	3		

### Appendix G - Length-frequency of fishes caught by electro-fishing for intake bubbler study August 12-16, 1974

Total		Flat-		1		Small-	Large-	1	
Length in	Channel	head	White			mouth	mouth	Green	
Centimeters	Catfish	catfish	bass	Sauger	Walleye	bass	bass	Sunfish	Bluegill
		·	•				T.		
$0.0 = 1.9^{\circ}$	-			1			1	2	
2.0 - 3.9									7
4.0 - 5.9			1	1	1		1		
6.0 - 7.9			46				1	2	
8.0 - 9.9	,		133				2	10	6
10.0 - 11.9			16		1 **			5	9
12.0 - 13.9				1	2		1	3	8
14.0 - 15.9			1						3
16.0 - 17.9			1		A STREET		1.1.1.1.1	1	1
18.0 - 19.9		1	1						3
20.0 - 21.9			. 3	1			1		<u> </u>
22.0 - 23.9									
24.0 - 25.9			,		a daga sa daga	and the second second second second second second second second second second second second second second secon			
26.0 - 27.9				1					
28.0 - 29.9	1							1	
30.0 - 31.9					·	, , ,	1	1	
32.0 - 33.9	1		. 2			2			
34.0 - 35.9	1		<u> </u>						
36.0 = 37.9	1					1		1	
38.0 - 39.9			2		1				
and the second second second second second second second second second second second second second second second	<b>1</b>	البرمين محدي المرجع					·		
40.0 - 44.9	1	1			· · ·		<u> </u>	<u> </u>	· · · ·
45.0 - 49.9								1	
50.0 - 54.9			, .		7			1	· · · · · · · · · · · · · · · · · · ·
55.0 - 59.9						i <b>Quinne aig an Guinne aig</b> An an an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna a An an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an Anna an An		1	
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65.0 - 69.9							and the second second second second second second second second second second second second second second second	<u> </u>	
70.0 - 74.9						a da ang ang ang ang ang ang ang ang ang an	· ·		
75.0 - 79.9			nangantangangangangan nang				and the second second second second second second second second second second second second second second second		
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95.0 - 99.9	<u> </u>							<u> </u>	
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#### Appendix G Cont. - Length-frequency of fishes caught by electro-fishing for intake bubbler study August 12-16, 1974 (Cont.)

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Total		1	I	Fresh-	1				
Length in	Rock	White	Black	water			ł		
Centimeters	hock	ananaia	DIACK	dmum	1			<b>I</b> .	
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0.0 - 1.9			L					ļ	
2.0 - 3.9		L	3			L	1		·
4.0 - 5.9		1	<u>  1</u>					<u> </u>	
6.0 - 7.9	12		1	1					1
8.0 - 9.9	34	1	1	1					
10.0 - 11.9	23								
12.0 - 13.9			1				1		·
14.0 - 15.9	1	and the second se				1	1	1	
16.0 - 17.9							1	1	
180 - 199			2	1			<u> </u>		
$\frac{10.0}{20.0} - \frac{1}{21.0}$			<u>~</u>			<u> </u>			
20.0 - 21.9									
22.0 - 25.9			<u> </u>					ļ	
24.0 - 25.9				~~~~~~					
26.0 - 27.9									
28.0 - 29.9				2					
30.0 - 31.9				2					
32.0 - 33.9									
34.0 - 35.9				3					
36.0 - 37.9				2					
38.0 - 39.9									
40.0 - 44.9									
45.0 - 49.9				and the second second second second second second second second second second second second second second second		a a a a a a a a a a a a a a a a a a a			Merry Mary Construction of the
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75.0 - 79.9									
00.0 - 04.9									
85.0 - 89.9									
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Appendix G Cont. - Length-frequency of fishes caught by electro-fishing for intake bubbler study August 12-16, 1974 (Cont.)