SECTION II

PRAIRIE ISLAND NUCLEAR GENERATING PLANT ENVIRONMENTAL MONITORING PROGRAM 2011 ANNUAL REPORT

SUMMARY OF THE 2011 FISH POPULATION STUDY

Report
by
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INTRODUCTION

To fulfill part of the continuing environmental monitoring requirements of the Prairie Island Nuclear Generating Plant, (PINGP), the Mississippi River fisheries population was sampled near Red Wing, Minnesota, May through October, 2011. The study area extends from 3.6 miles upstream of the plant (River mile 802) to 10.8 miles downstream of the plant (River mile 787.5), (Figure 1). The original objective of the study was to "determine existing ecological characteristics before plant operation and to assess any significant changes to the aquatic environment after operation" (NSP 1972). The objective was changed slightly after the plant became operational in 1973; to "determine environmental effects of the PINGP on the fish community in the Mississippi River and its backwaters" (Hawkinson 1973). Presently, the objective is to monitor and assess the status of the fishery in the vicinity of the PINGP (Mueller 1994). Parameters analyzed and compared to previous years include species composition, length-weight regressions, percent contribution (fish/hr), length-frequency distributions, and catch per unit effort (CPUE) for selected species.

METHODS AND MATERIALS

Fish were collected using a Smith-Root SR-18 Electrofishing boat equipped with a 5.0 GPP electrofishing unit (Figure 6). The power source was a 5.0 GPP generator. The 5000 watt generator has a maximum output of 16 amps, and a range of 0-1000 volts. The generator has the capability to be either pulsed AC or DC with a pulse frequency of 7.5, 15, 30, 60, and 120 Hz. The annode consists of two umbrella arrays, each with six dropper cables. The 18 foot boat and dropper cables hung from the front of the boat serve as the cathode. Collection occurred during daylight hours with a pulsed direct current. Due to the constantly changing river conditions, Electrofisher output was varied to enhance the effectiveness.

Sampling was done monthly, May through October, within four established sectors of the study area (Figures 1-5). The runs within each sector are similar to previous years sampling to ensure a similar set of relative data indices for yearly comparison. At the end of each "run", the elapsed shocking time was recorded from a digital timer, which only tallied the seconds that the electrical field was energized. A run was terminated after approximately 450 seconds shocking time or when the end of the prescribed run was reached.

Stunned fish were captured with one-inch stretch mesh landing nets equipped with eight-foot insulated handles. Fish were placed in live-wells, supplied with river water constantly, until the end of each run. At the end of each run fish were identified, measured to the nearest millimeter (total length), weighed to the nearest 10 grams, and released. Parameters used to describe the fisheries include species composition, length-weight regressions, percent contribution, length-frequency distributions, and catch per unit effort (CPUE). It is assumed that population dynamics and spatial distribution is represented by CPUE.

Electrofishing CPUE was computed as numbers of fish per hour for each sector. Length frequencies in 20 millimeter intervals were calculated for all fish species. Length-weight relationships were calculated using the length-weight formula:

$$\log W = \log a + b \log L,$$

where W is the weight in grams, a is the y axis intercept, b is the slope of the regression line, and L is the total length in millimeters.

RESULTS

Initial PINGP preoperational annual environmental reports simply listed all data collected without discussion or analysis (NSP 1972). Individual species were not discussed, due to the amount of data collected during initial sampling efforts. Representative species were selected in 1975 for abundance comparisons based on electrofishing data (Gustafson et. al. 1975), modified in 1986 after seining was eliminated (Donkers 1986), and in 1989 smallmouth and largemouth bass were added as they "have been seen more frequently in the electrofishing catch during recent years in the PINGP study area" (Mueller 1989).

Electrofishing collection methods changed before the 1982 sampling season. The mesh size of the dip nets was increased to one inch stretch mesh. The larger mesh size enabled small adult fish and some young of the year fish of certain species to avoid collection. Currently, individual gizzard shad, freshwater drum, and white bass less than 160 mm are not collected. Also, logperch and cyprinids (other than carp) are no longer collected, due to their small size (Donkers 1987). Therefore, a direct comparison of electrofishing CPUE prior to 1982 is inappropriate to later years.

Species collected in 2011 are compared to previous years in Table 1. A total of 5,940 fish, comprising 40 species, was collected in the 2011 survey (Table 2). The number of species is the same as 2010, with ten more individuals collected compared to 2010 (Giese 2010).

All species collected in 2011 are ranked according to electrofishing CPUE and listed in Table 2. Summaries for selected species (Tables 3-9) are based on electrofishing and trapnetting data for years 1977 through 1987, and on electrofishing data only for years 1988 through 2011, since trapnetting was discontinued after 1987 (Orr 1988). Annual CPUE for selected species is compared to previous years (Figures 15-22), by sector (Figures 23-30), and by date (Figures 31-38).

The top three abundant species, based on CPUE, was determined for each sector.

Sector One;	freshwater drum, shorthead redhorse, white bass
Sector Two;	freshwater drum, bluegill, white bass
Sector Three;	white bass, freshwater drum, carp
Sector Four;	freshwater drum, white bass, shorthead redhorse
Overall CPUE Average;	freshwater drum, white bass, shorthead redhorse

Table 10 summarizes the percent contribution of historically predominant species in the annual catch. Length frequency distributions for selected species are illustrated by sector in Figures 7 through 14.

DISCUSSION

When dealing with a large river environment, a high degree of natural variability exists in habitat conditions and therefore, in fish distribution. Palmquist (1982) proposed the wide range in species abundance between study sectors was largely due to habitat preferences of a species rather than PINGP induced. A high degree of variability in species abundance exists within sectors from year to year. Differences in collection efficiency and year class strengths may explain this variability.

A qualitative and quantitative discussion for selected species, with respect to other years, includes: 1) CPUE, 2) rank, 3) percent composition of catch, 4) population condition as depicted by length-weight regression analysis, and 5) mean length.

Average mean length was calculated by splitting the length data for each species into 20 mm intervals and multiplying the number of fish in each interval by the median length of that interval (Example: The number of fish in the 260-279 mm interval was multiplied by 270 mm). Interval totals were summed, divided by the total number of fish, and rounded to the nearest 10 mm.

GIZZARD SHAD

Electrofishing CPUE for gizzard in 2011 (1.00 fish/hr) was the lowest recorded since 1997 (Figure 15). Sectors 2-4 had a decrease in CPUE comparing 2011 to 2010, while sector 1 had a slight increase (Figure 23). Gizzard shad CPUE has been experiencing a slight downward trend since 2004 (Table 3). Sector 4 had the highest CPUE for any sampling date in May, while sector 2 CPUE was virtually zero except in October (Figure 31).

Shad ranked 16th in 2011 (Table 2), and presently comprise one percent of the catch (Table 10). The general condition of gizzard shad, 2.792, falls into the range of previous years, 2.388 to 3.934 from 1982-2010 (Table 3). Carlander (1969) sites a population in Canton Lake, Oklahoma with a range in total fish length of 173 to 335 mm and a regression slope of 3.066 which compares well to the fish in this study. The mean length for gizzard shad (400 mm) is tied for the second highest recorded since the study began (Table 3). The length frequency data indicates a range of approximately 170-500 mm, with the main peak occurring at approximately 420 mm (Figure 7).

FRESHWATER DRUM

Freshwater Drum CPUE for 2011, (32.03 fish/hour) increased from 28.97 fish/hr in 2010 (Figure 16). CPUE was higher in all sectors, except sector 3, when comparing 2011 to 2010 (Figure 24). The highest CPUE in a sector for any month occurred in sector 4 in May (Figure 32).

Freshwater drum CPUE ranked first in 2011 (Table 2), comprising 24 percent of the catch (Table 4).

The general condition of freshwater drum has remained relatively stable, as depicted by a regression slope of 3.194 in 2011, in comparison to a range of slopes of 2.598 to 3.299 from previous years of the study (Table 4). The mean length for freshwater drum was approximately 340 mm in 2011 (Table 4). The length frequency data for freshwater drum suggest that a peak occurs at approximately 300 mm (Figure 8).

SHORTHEAD REDHORSE

Historically, electrofishing CPUE for shorthead redhorse has ranged from 7.07 to 32.47 fish/hour (Figure 17). CPUE for 2011 (18.65 fish/hr) is a slight decrease from 2010 (19.11 fish/hr) (Table 5). Both upstream sectors had a decrease in CPUE, while both downstream sectors had an increase in CPUE when comparing 2011 to 2010 (Figure 25). The 2011 CPUE is also variable between sectors, ranging from 32.78 fish/hour in Sector 1, to 9.07 fish/hour in Sector 2 (Table 2). CPUE for each sector is highly variable during the collection year, with the highest CPUE occurring in Sector 3 in October (Figure 33).

Shorthead redhorse ranked third in 2011 (Table 2), comprising 14 percent of the catch (Table 5).

The general condition of shorthead redhorse has remained relatively stable, as depicted by a regression slope of 2.935 in 2011, in comparison to a range of slopes of 2.571 to 3.041 from previous years of the study (Table 5). The length-weight regression slope of shorthead redhorse in the vicinity of Prairie Island is about the same as that of another population of Upper

Mississippi River shorthead redhorse as reported by Carlander (1969) as having a slope of 2.83. The mean length for shorthead redhorse at Prairie Island was approximately 370 mm in 2011 (Table 5). The length frequency data show that the main peaks occur at approximately 240, 330, and 370 mm (Figure 9).

WHITE BASS

Electrofishing CPUE for white bass in 2011 (21.26 fish/hr) is approximately 5 fish/hr less than 2010 (Table 6). CPUE decreased in all sectors when comparing 2011 to 2010 (Figure 26). A large difference is evident when comparing CPUE upstream of Lock and Dam 3 (sector 1 and 2) to downstream of Lock and Dam 3 (sector 3 and 4) (Table 2). Overall CPUE appears cyclic (Figure 18) with year to year variability within each sector (Figure 26). Highest CPUE for any month sampled, occurred in Sector 4 in May (Figure 34).

White bass ranked second in 2011 (Table 2). Presently, white bass comprise 16 percent of the catch (Table 10).

The general condition of white bass has remained relatively stable, as depicted by a regression slope of 2.765 in 2011, in comparison to a range of slopes of 2.441 to 3.085 from previous years of the study (Table 6). The mean length for white bass (340 mm) is the same as 2010, and slightly longer than the values of the last fourteen years (Table 6). The length frequency data shows that main peaks occur for white bass at approximately 250 and 300 mm (Figure 10).

WALLEYE

Overall electrofishing CPUE for walleye increased in 2011 (4.29 fish/hour), when compared to 2010 (3.47 fish/hr) (Figure 19) as a result of an increase in each sector, except sector 4 (Figure 27). The highest CPUE for any sector in any month was Sector 1 in June (Figure 35).

Walleye ranked ninth in 2011 in overall catch abundance (Table 2). Presently, adult walleye comprise three percent of the catch (Table 7).

The general condition of walleye has remained relatively stable, as depicted by a regression slope of 3.084 in 2011, in comparison to a range of slopes of 2.852 to 3.352 from previous years of the study (Table 7). The mean length for walleye (440 mm) is less than 2010 (Table 7). The length-frequency relationship indicates a main peak occurring at approximately 320 mm (Figure 11).

SAUGER

Electrofishing CPUE for sauger was 7.33 fish/hr in 2011, a slight increase from 2010 (Table 8 and Figure 20). Sauger CPUE increased in all sectors in 2011 compared to 2010 (Figure 28). Sector 3 had the highest CPUE in October of any sector in any month (Figure 36).

Sauger ranked sixth in 2011 (Table 2), comprising five percent of the catch (Table 8).

The general condition of sauger has remained relatively stable, as depicted by a regression slope of 3.077 in 2011, in comparison to a range of slopes of 2.648 to 3.356, in previous years of the study (Table 8). The mean length for sauger was approximately 300 mm in 2011, which is slightly higher than the previous seven years (Table 8). The length frequency data exhibit a range of 150-530 mm, with a broad peak occurring at approximately 250 to 350 mm (Figure 12).

SMALLMOUTH BASS

Electrofishing CPUE for smallmouth bass in 2011 had the lowest CPUE (8.15 fish/hr) since 1997 (Figure 21). CPUE in Sectors 1-4 exhibit great variability (Figure 29) with each sector's appearance similar in shape to the curve for all sectors combined (Figure 21). For the second consecutive year, CPUE decreased in all sectors compared to the year previous (Figure 29). The highest CPUE occurred in Sector 3 in October. Sector 3 had the highest CPUE for four of the six months, compared to the other sectors (Figure 37).

Smallmouth bass ranked fifth in 2011 (Table 9), comprising six percent of the catch. Smallmouth bass have a length frequency range of approximately 130-510 mm, with peaks occurring at approximately 200, and 350 mm (Figure 13).

LARGEMOUTH BASS

Largemouth bass CPUE for 2011, (2.78 fish/hour), was higher than 2010 (1.64 fish/hr) which was the second lowest value recorded since 1995 (Figure 22). The CPUE for Sector 1 was zero for all sampling dates, while Sectors 2-4 have a little more variability (Figure 30). The highest CPUE occurred in Sector 4 in October (Figure 38).

Largemouth bass ranked eleventh in 2011 (Table 9), comprising two percent of the catch. Historically, largemouth bass rank has varied greatly, ranging from 7th to 20th (Table 9).

The length frequency data indicates a range of 120-450 mm, with the main peak occurring at approximately 340 mm (Figure 14).

GENERAL

The ten most abundant species collected during 2010 in descending order, based on average CPUE for all sectors combined were: 1) freshwater drum, 2) white bass, 3) shorthead redhorse, 4) carp, 5) smallmouth bass, 6) sauger, 7) bluegill, 8) silver redhorse, 9) walleye, and 10) quillback (Table 2).

Total average CPUE for all species and sectors combined decreased from 187.16 fish/hr in 2009 to 141.60 fish/hr in 2010, to 134.56 fish/hr in 2011 (Table 2).

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Figure 1

PRAIRIE ISLAND FISHERIES POPULATION - STUDY AREA

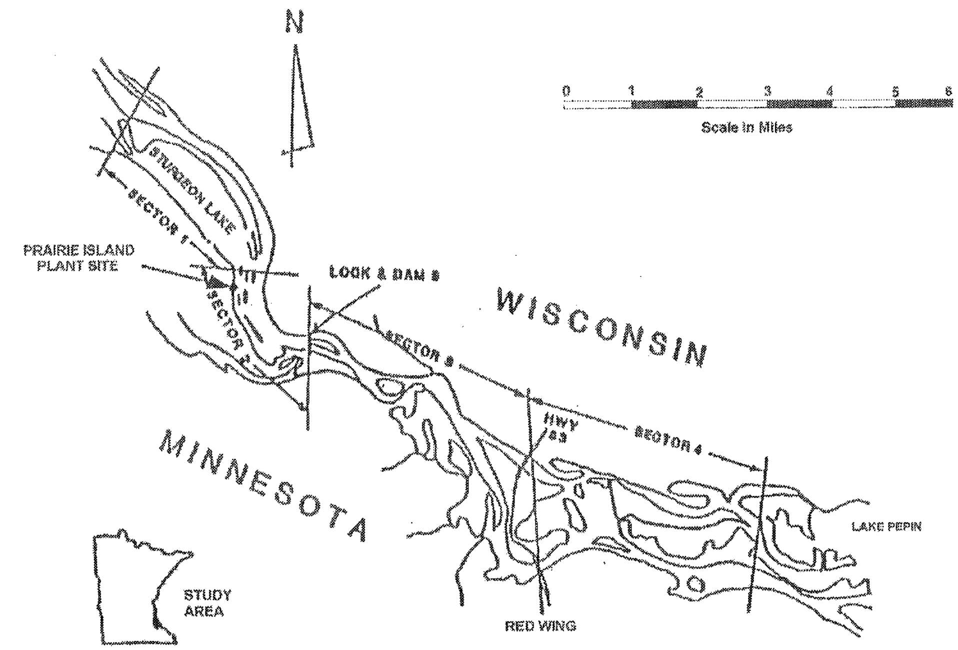


FIGURE 2.

PRAIRIE ISLAND FISHERIES POPULATION STUDY

Sampling Locations
Upstream
Sec 1 Runs 1-20

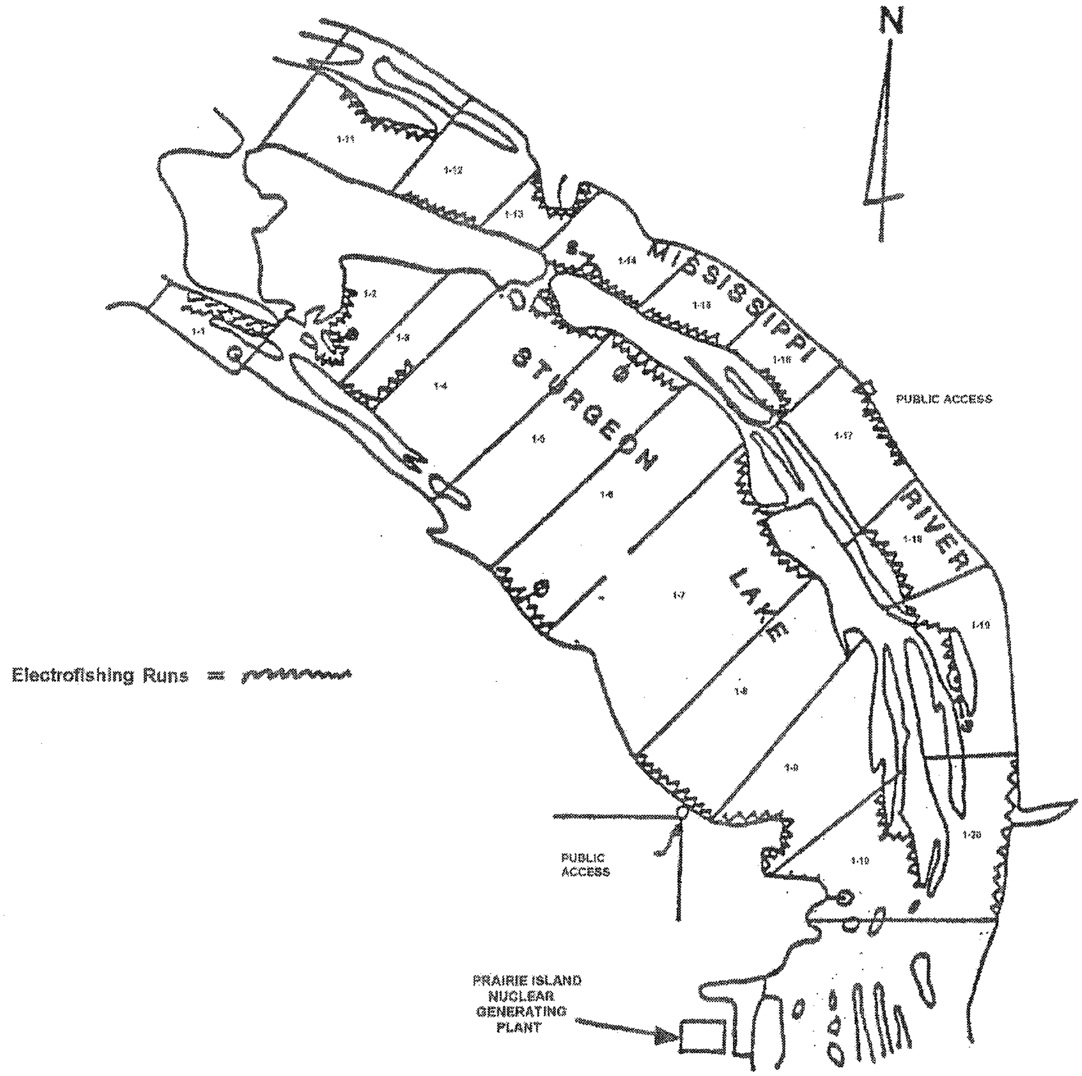


Figure 3.

PRAIRIE ISLAND FISHERIES POPULATION STUDY
Sampling Locations
Plant Area
(Sec 2 Runs 1-10)

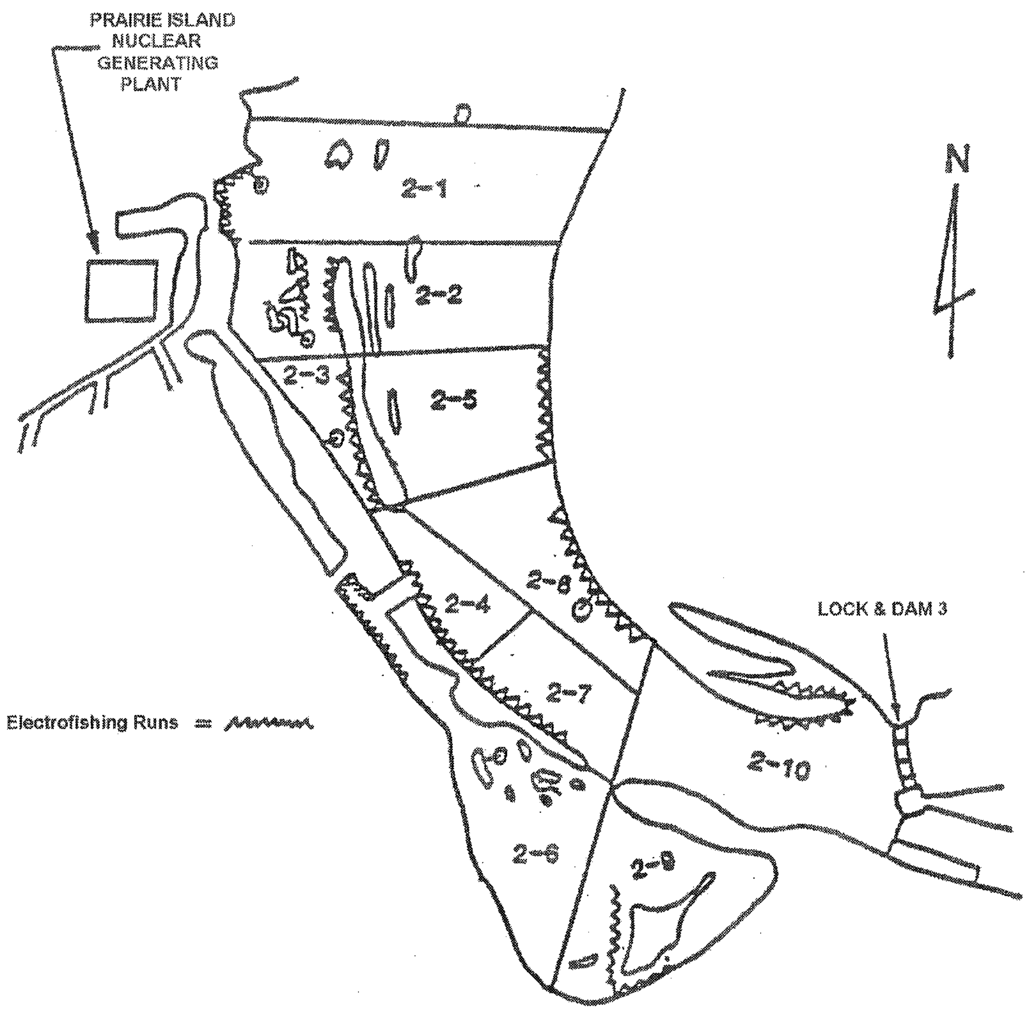


Figure 4.

PRAIRIE ISLAND FISHERIES POPULATION STUDY

Sampling Locations
Downstream
(Sec 3 Runs 1-10)

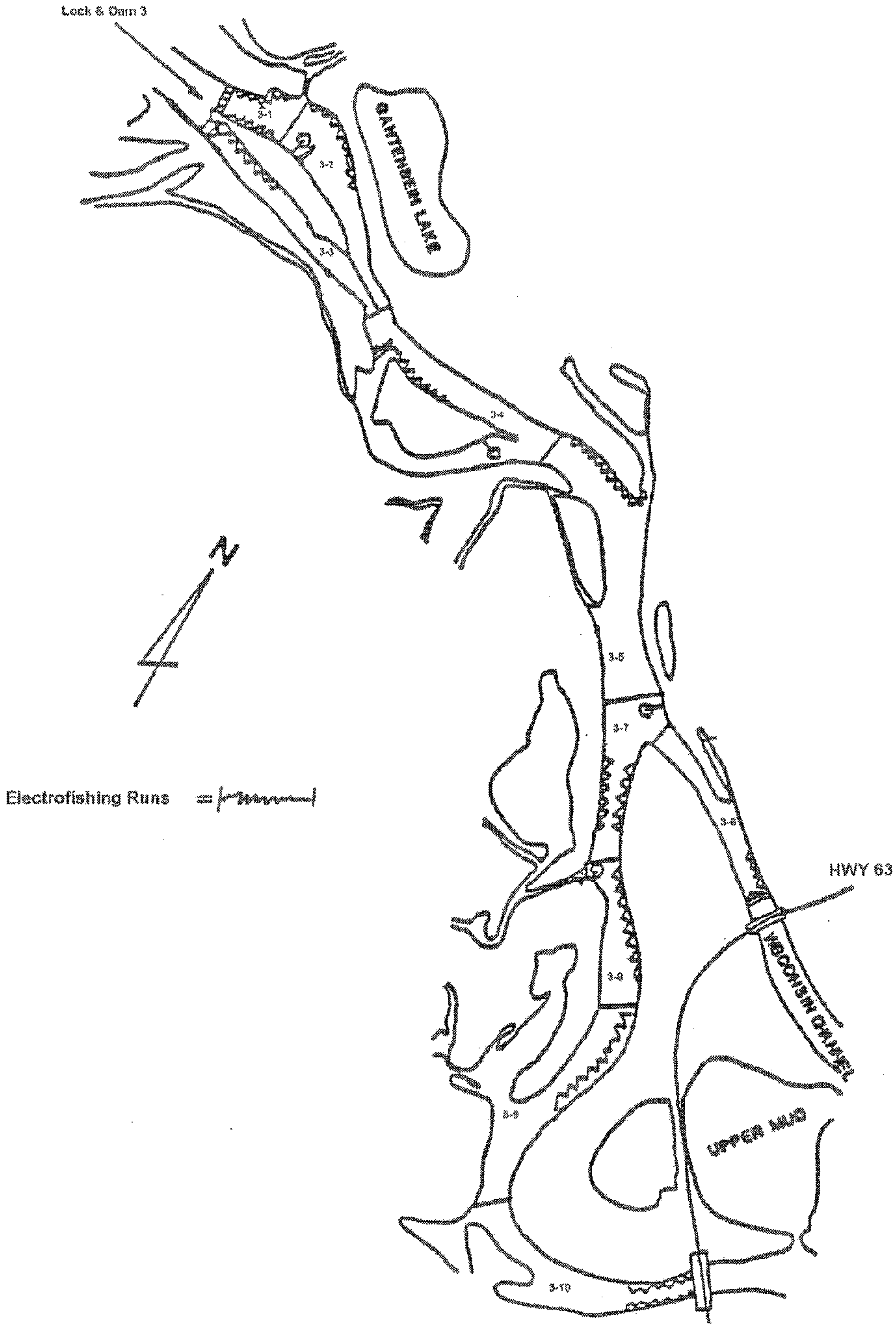
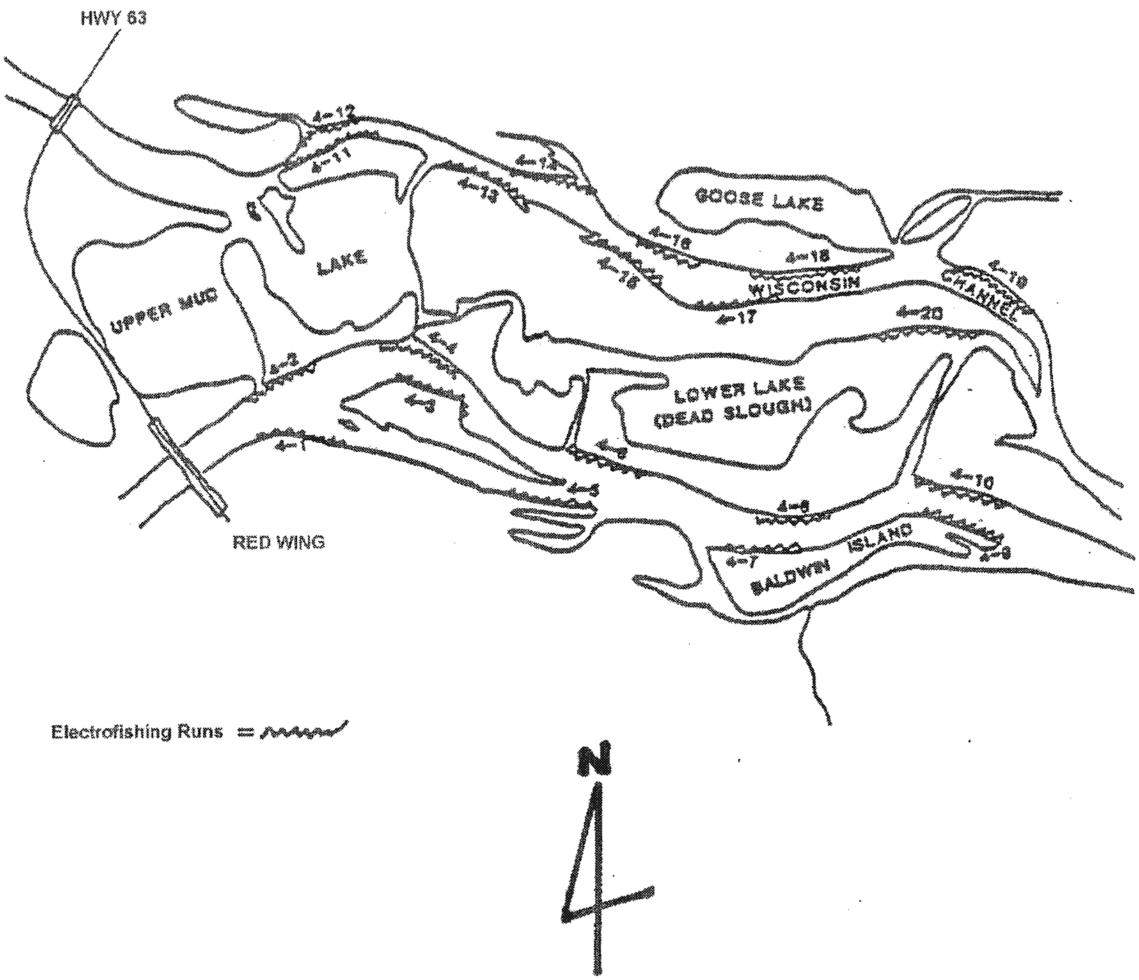


Figure 5.

PRAIRIE ISLAND FISHERIES POPULATION STUDY

Sampling Locations
Downstream
(Sec 4 Runs 1-20)



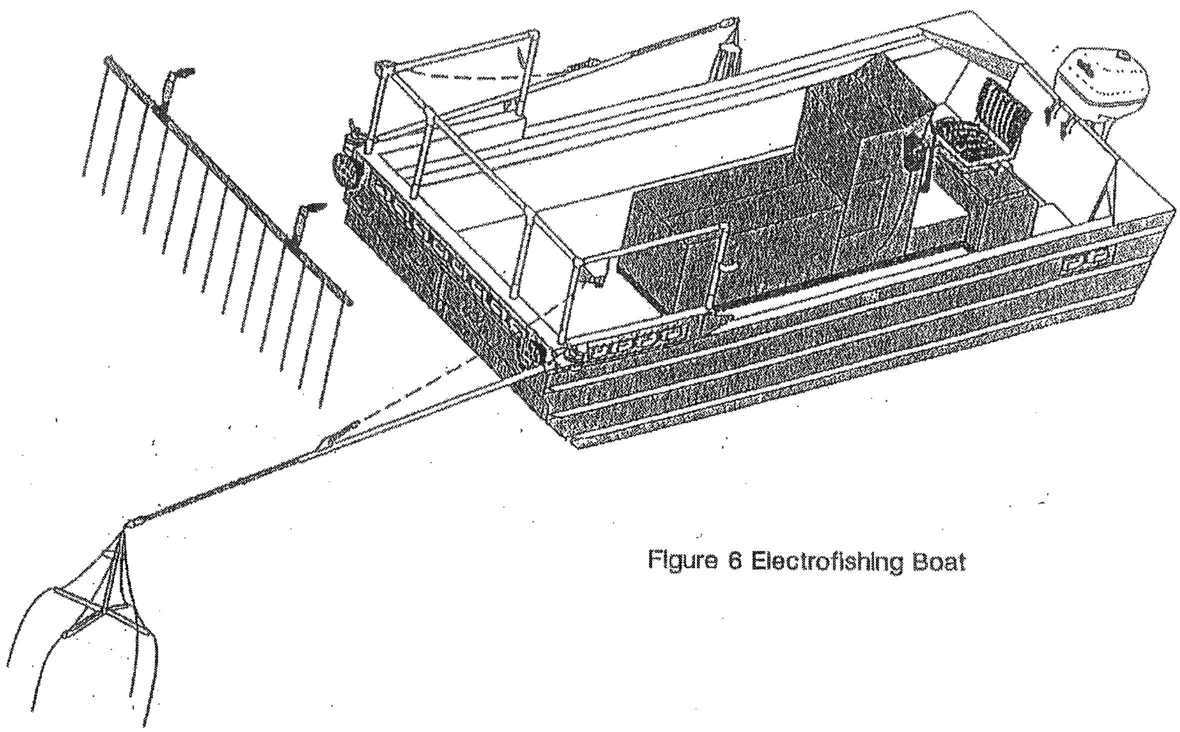
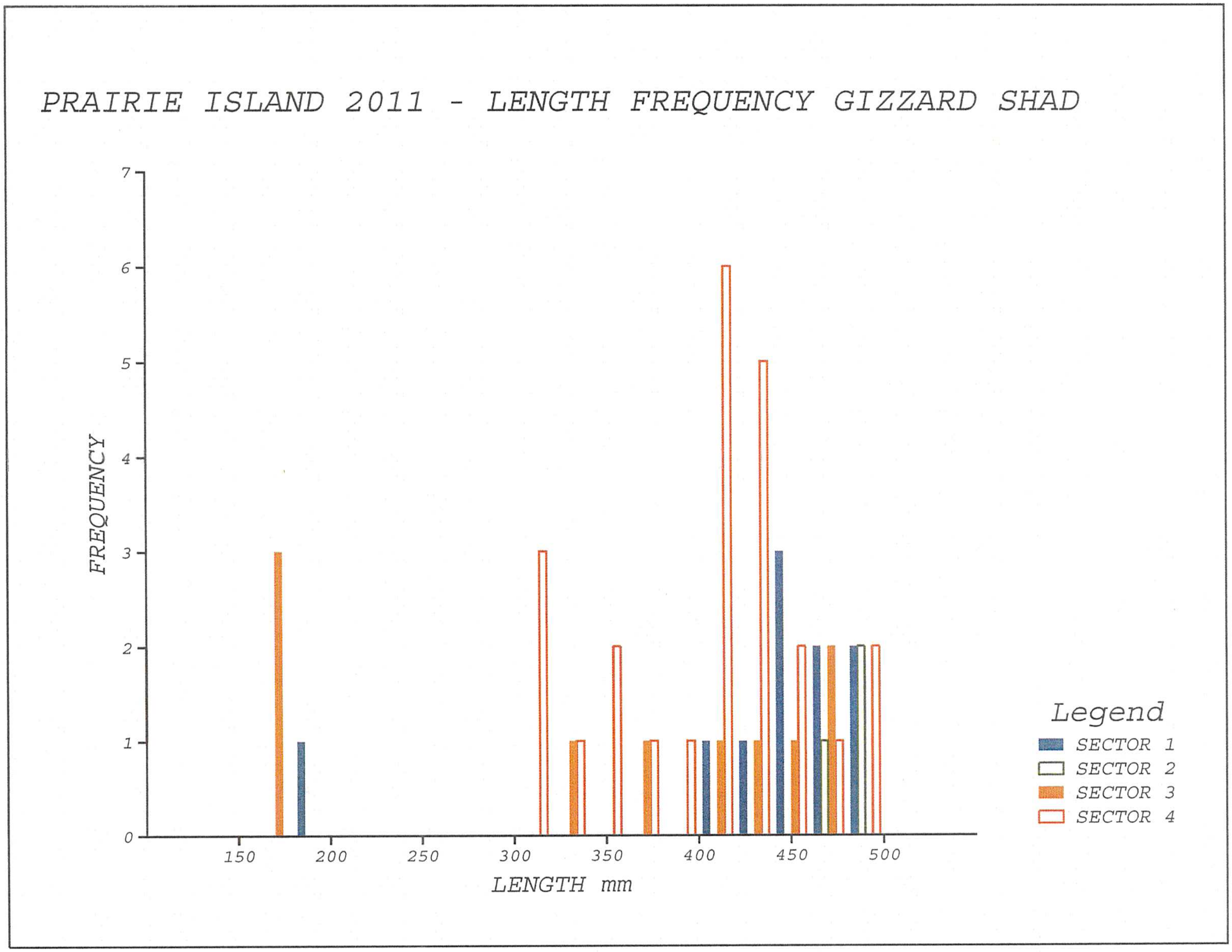


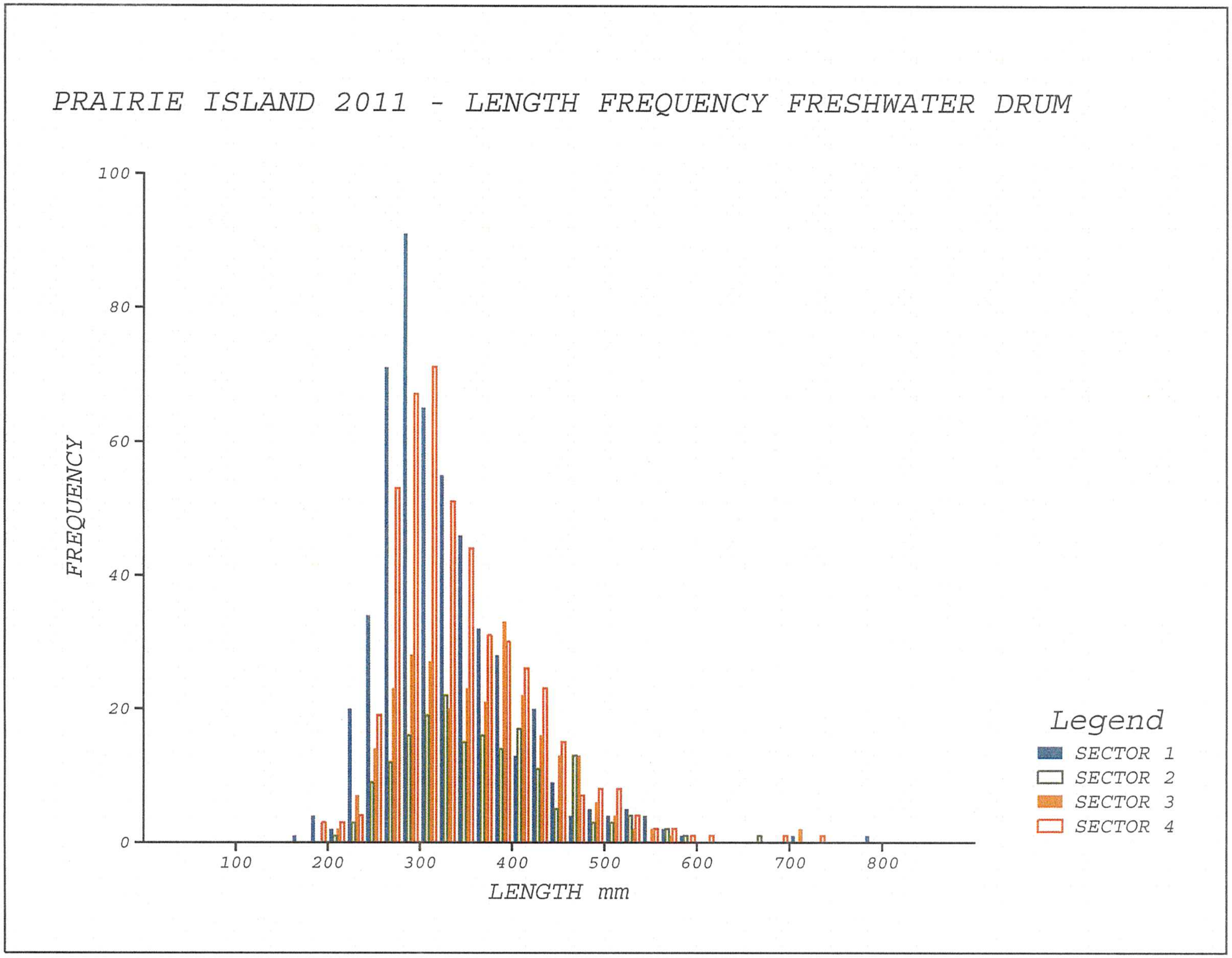
Figure 6 Electrofishing Boat

Figure 7



PRAIRIE ISLAND 2011 - LENGTH FREQUENCY GIZZARD SHAD
FREQUENCY
0
1
2
3
4
5
6
7
150
200
250
300
350
400
450
500
LENGTH mm
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 8



PRAIRIE ISLAND 2011 - LENGTH FREQUENCY FRESHWATER DRUM
FREQUENCY
0
20
40
60
80
100
100
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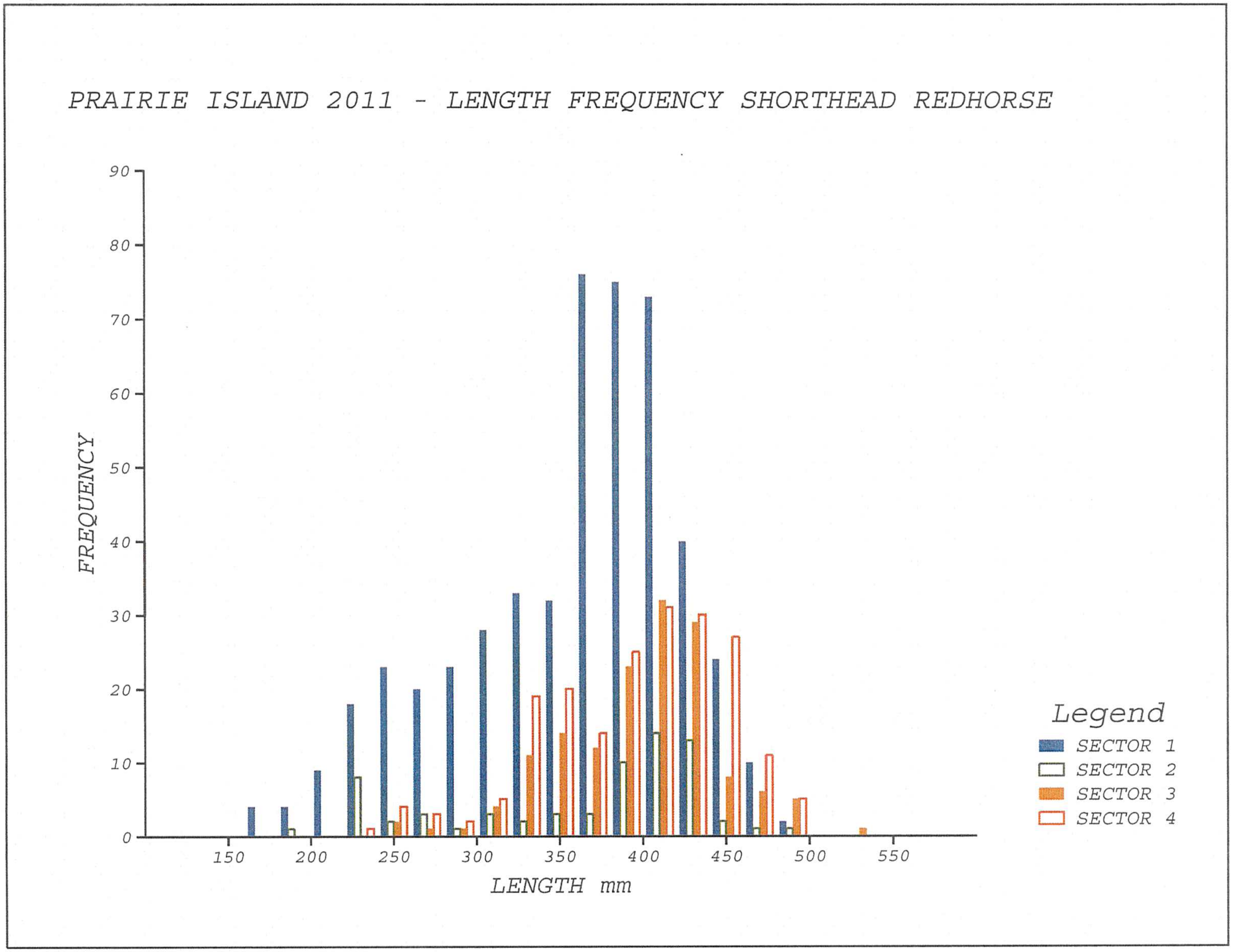
300
400
500
600
700
800
LENGTH mm
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 9


PRAIRIE ISLAND 2011 - LENGTH FREQUENCY SHORTHEAD REDHORSE
FREQUENCY
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20
30
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50
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70
80
90
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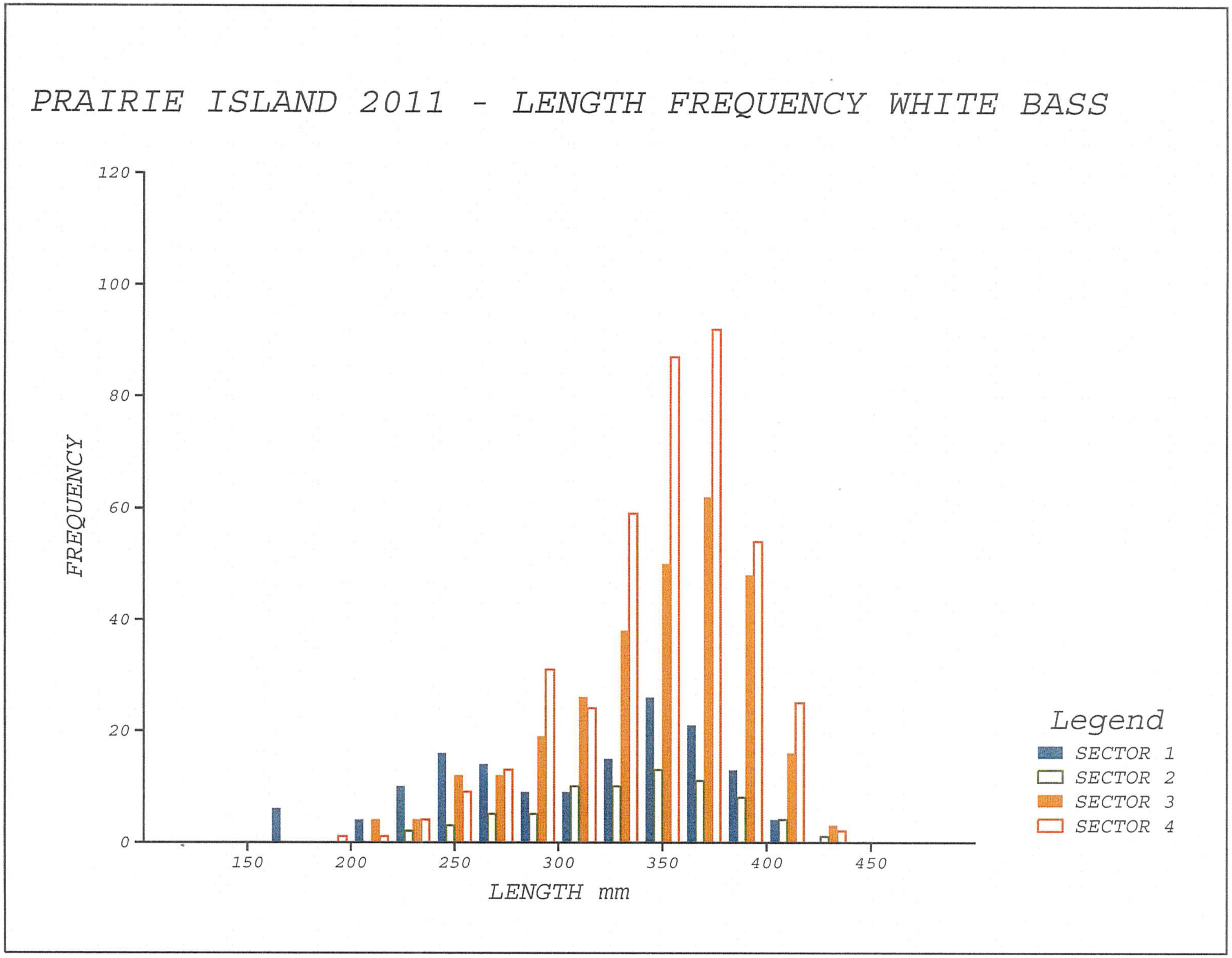
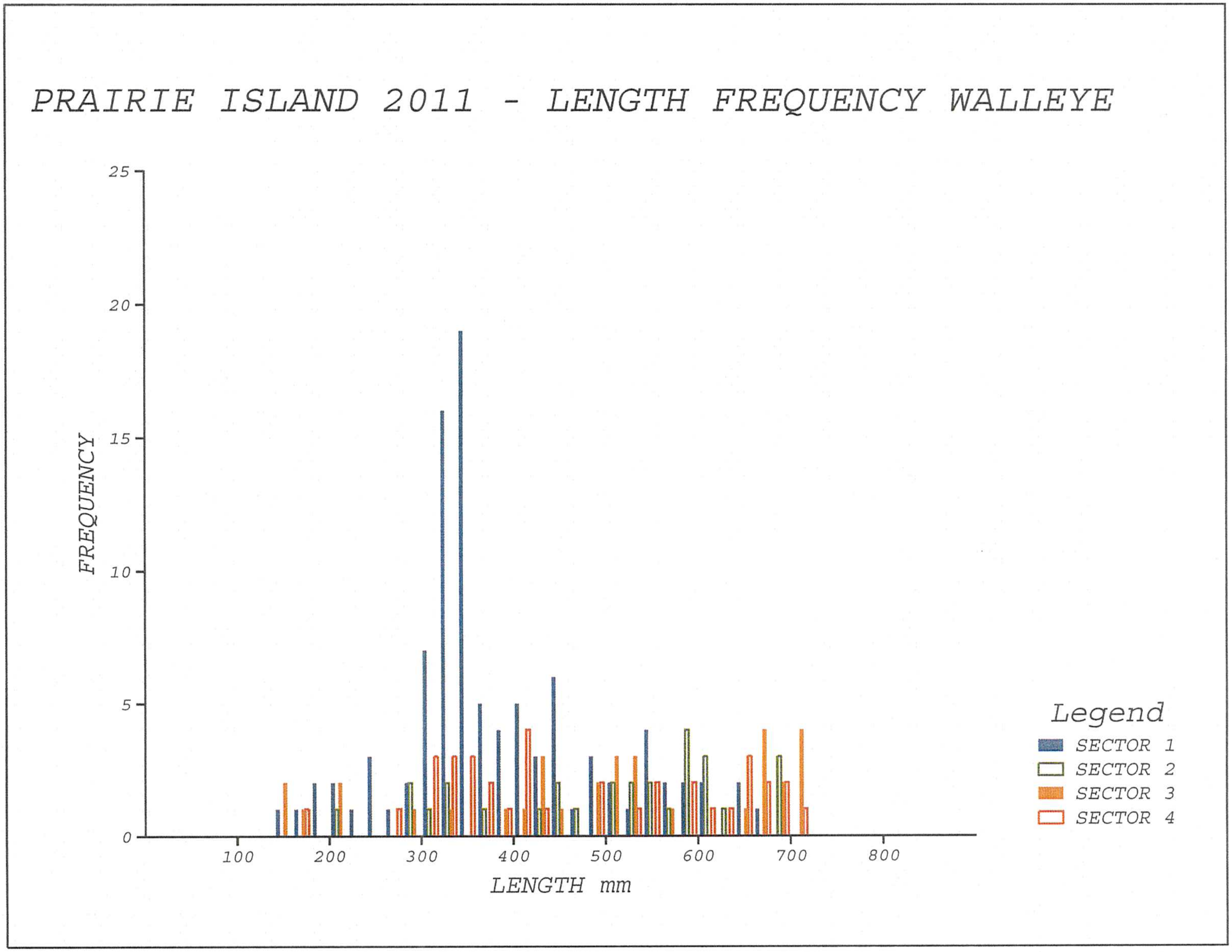
LENGTH mm
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 10



PRAIRIE ISLAND 2011 - LENGTH FREQUENCY WHITE BASS
FREQUENCY
0
20
40
60
80
100
120
150
200
250
300
350
400
450
LENGTH mm
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 11



PRAIRIE ISLAND 2011 - LENGTH FREQUENCY WALLEYE
FREQUENCY
25
20
15
10
5
0
100
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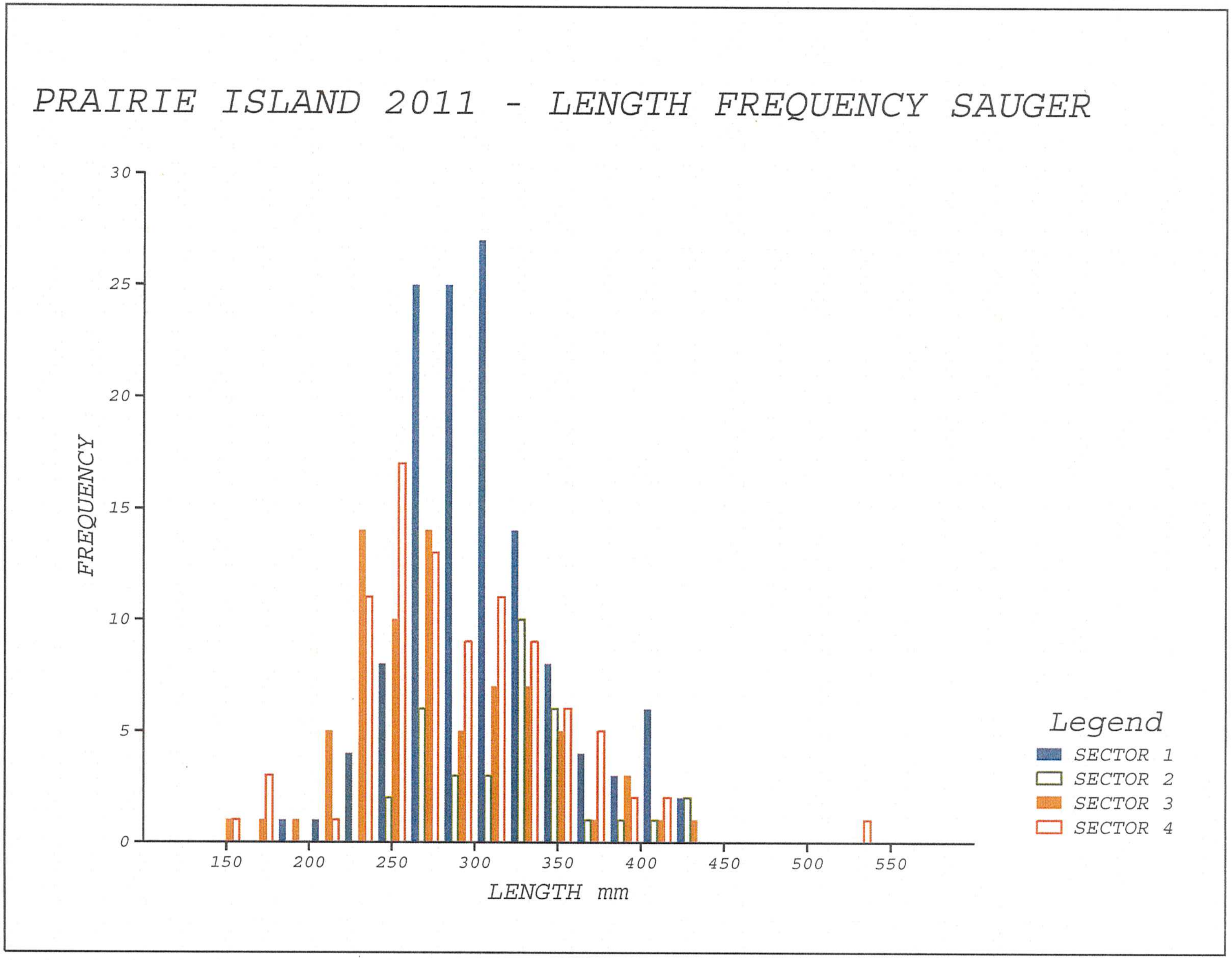
300
400
500
600
700
800
LENGTH mm
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 12


PRAIRIE ISLAND 2011 - LENGTH FREQUENCY SAUGER
FREQUENCY
0
5
10
15
20
25
30
150
200
250
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350
400
450
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550
LENGTH mm
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 13

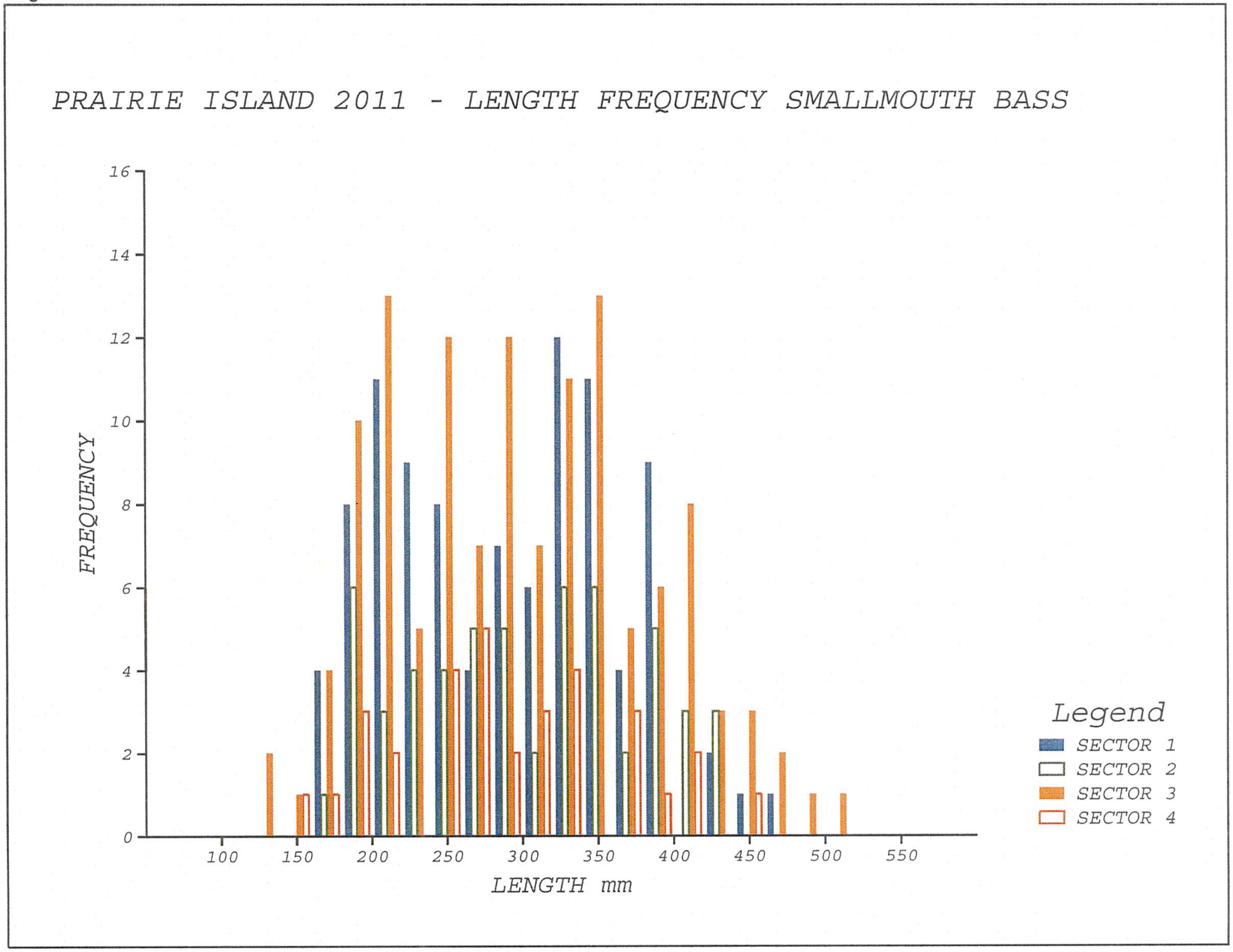

PRAIRIE ISLAND 2011 - LENGTH FREQUENCY SMALLMOUTH BASS
FREQUENCY
0
2
4
6
8
10
12
14
16
100
150
200
250
300
350
400
450
500
550
LENGTH mm
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 14

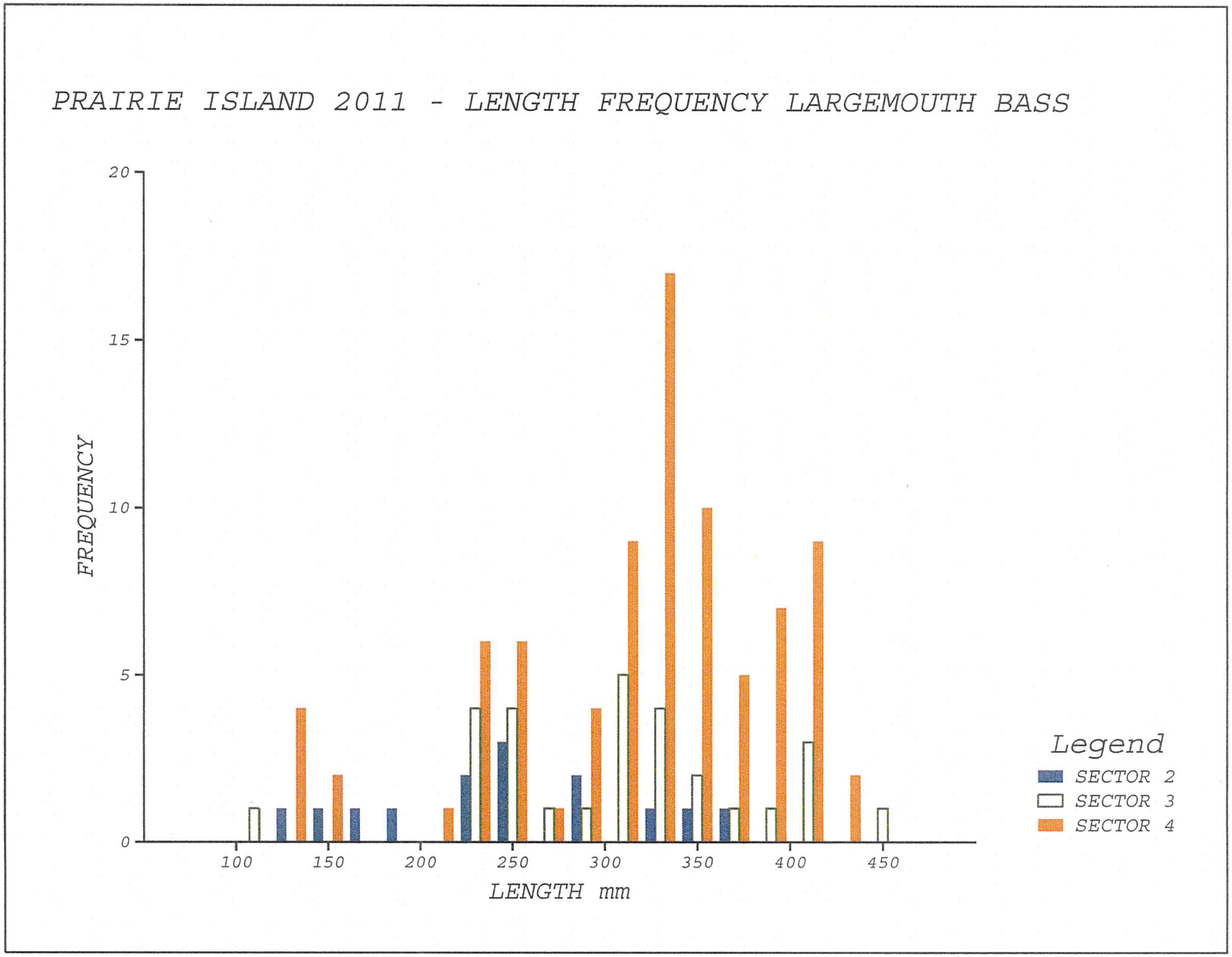

PRAIRIE ISLAND 2011 - LENGTH FREQUENCY LARGEMOUTH BASS
FREQUENCY
0
5
10
15
20
100
150
200
250
300
350
400
450
LENGTH mm
Legend
SECTOR 2
SECTOR 3
SECTOR 4

Figure 15. Electrofishing CPUE (fish/hour) for Gizzard shad for years 1982-2011 in the vicinity of PINGP.

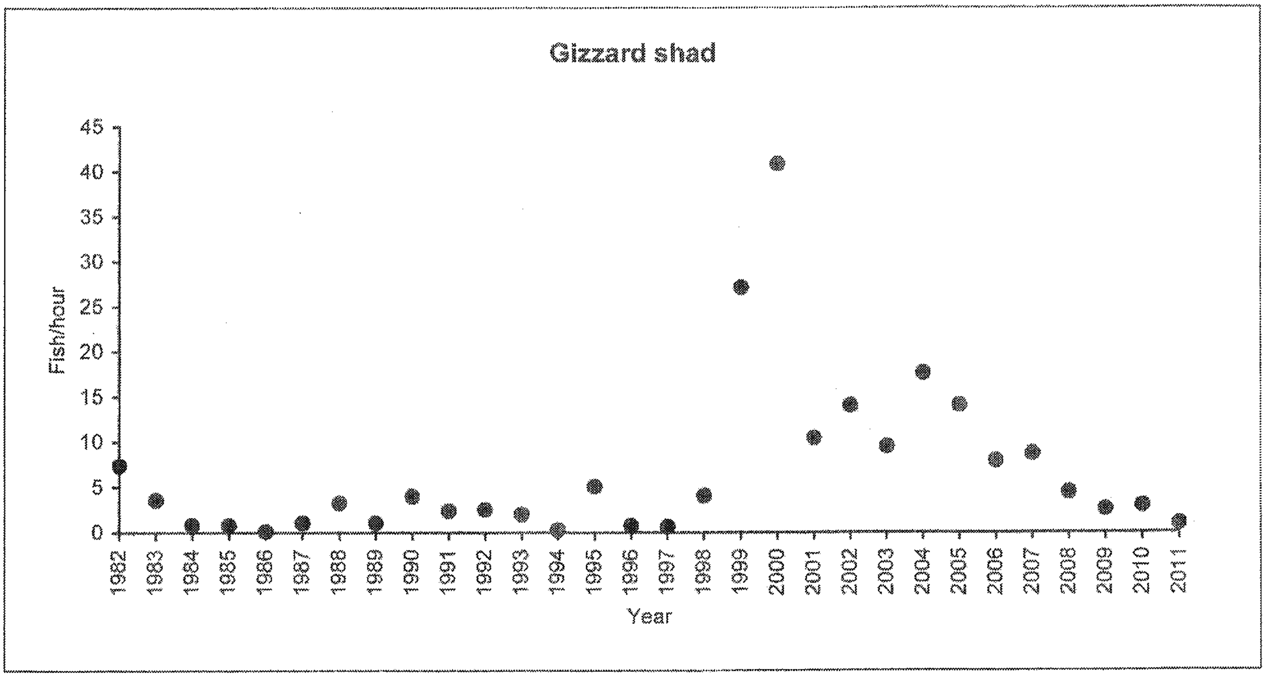


Figure 16. Electrofishing CPUE (fish/hour) for Freshwater drum for years 1982-2011 in the vicinity of PINGP.

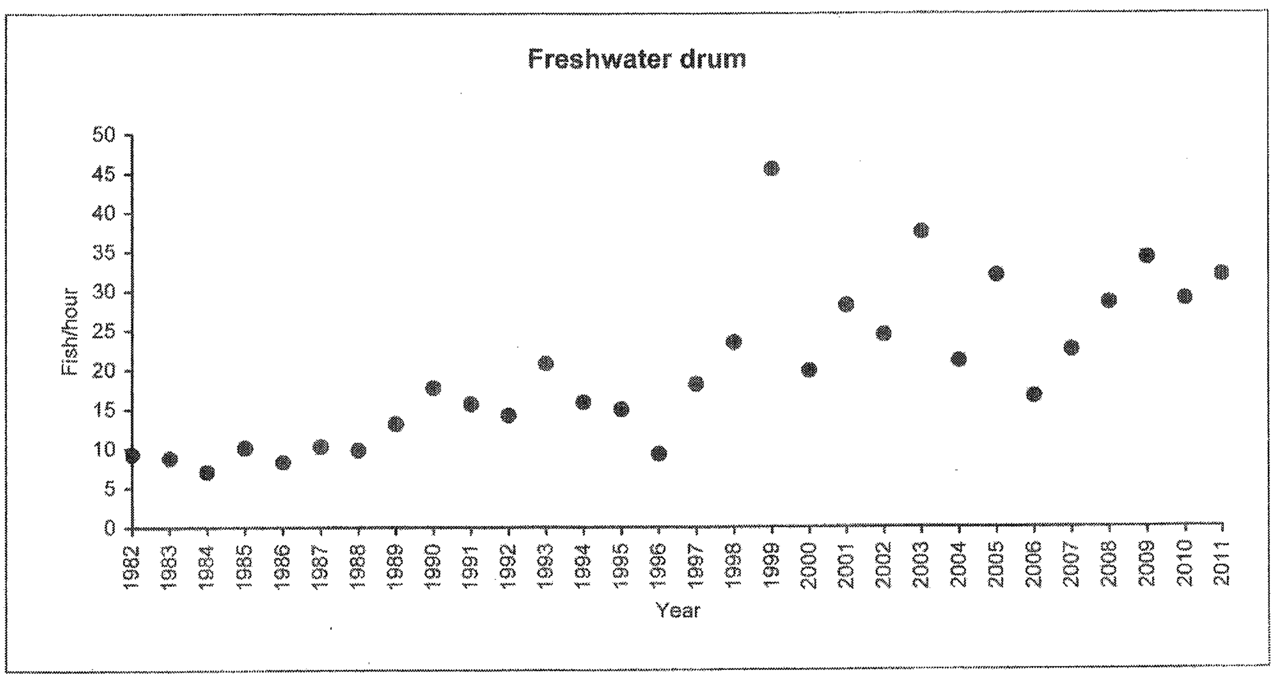


Figure 17. Electrofishing CPUE (fish/hour) for Shorthead redhorse for years 1982-2011 in the vicinity of PINGP.

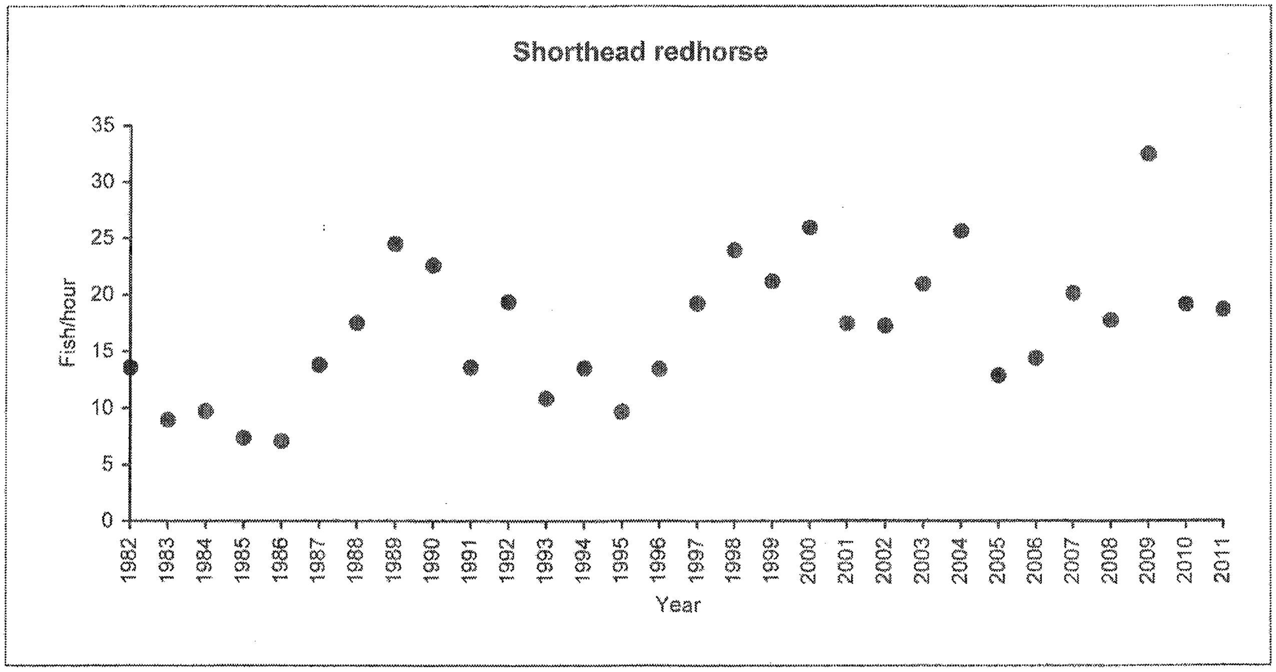


Figure 18. Electrofishing CPUE (fish/hour) for White bass for years 1982-2011 in the vicinity of PINGP.

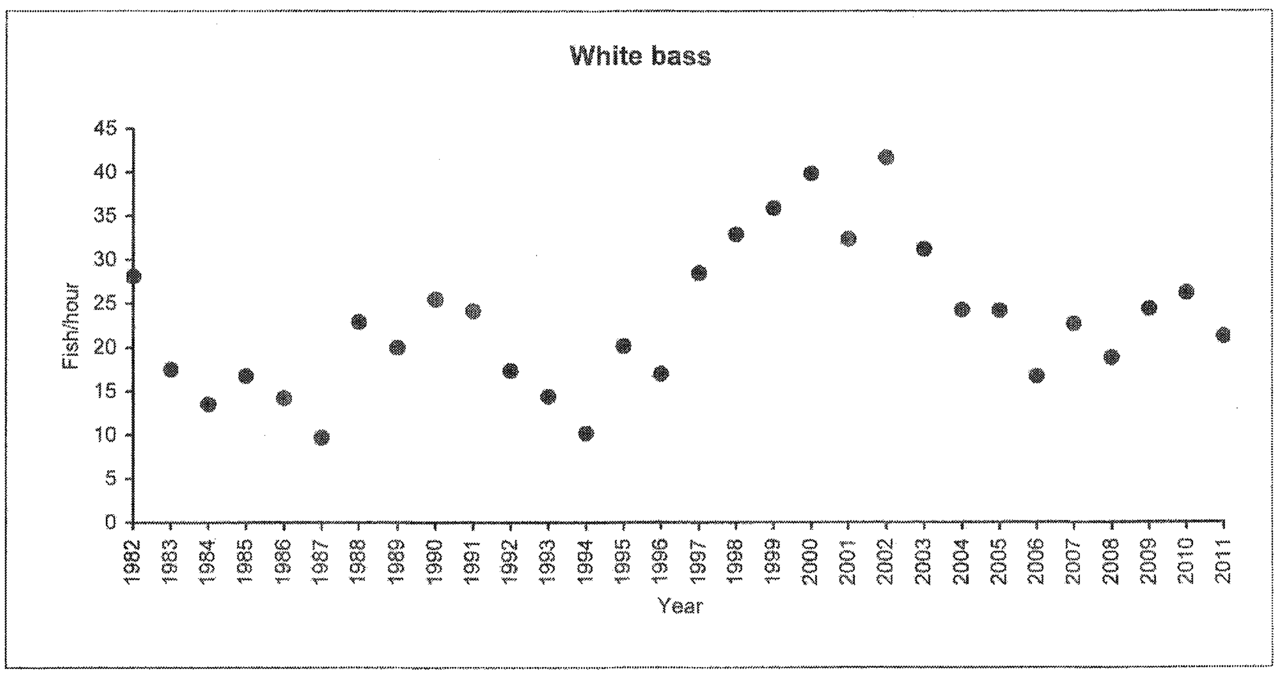


Figure 19. Electrofishing CPUE (fish/hour) for Walleye for years 1982-2011 in the vicinity of PINGP.

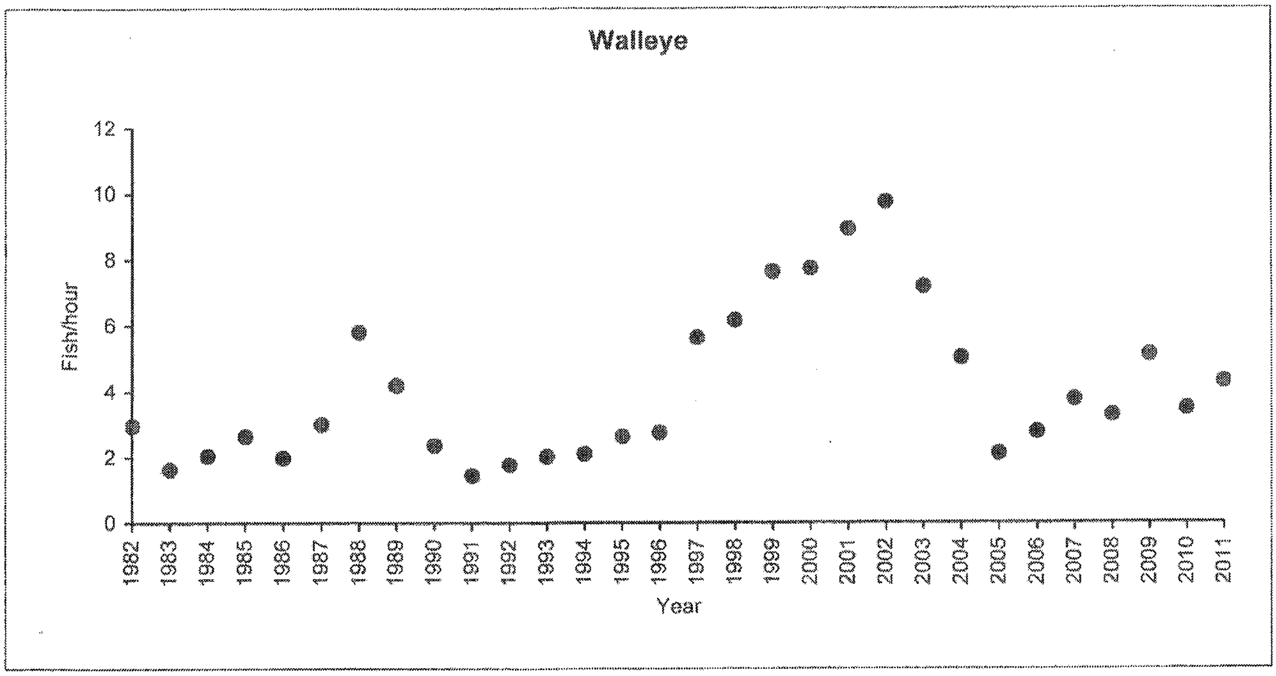


Figure 20. Electrofishing CPUE (fish/hour) for Sauger for years 1982-2011 in the vicinity of PINGP.

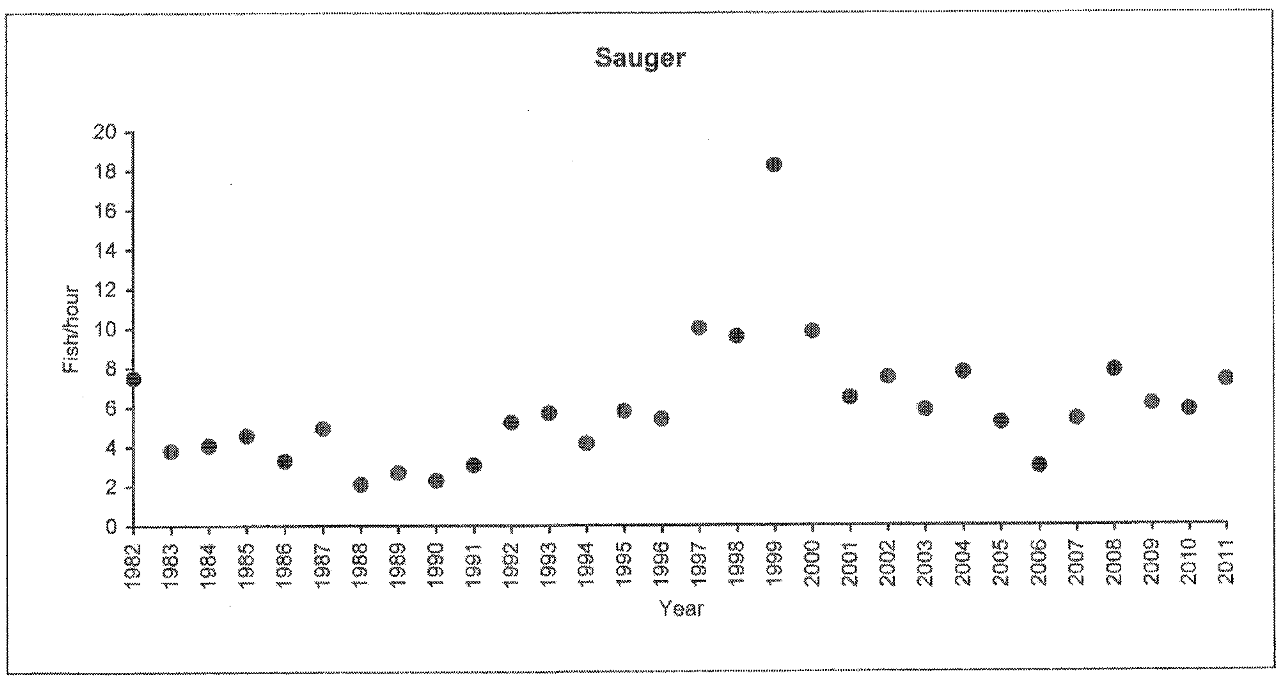


Figure 21. Electrofishing CPUE (fish/hour) for Smallmouth bass for years 1982-2011 in the vicinity of PINGP.

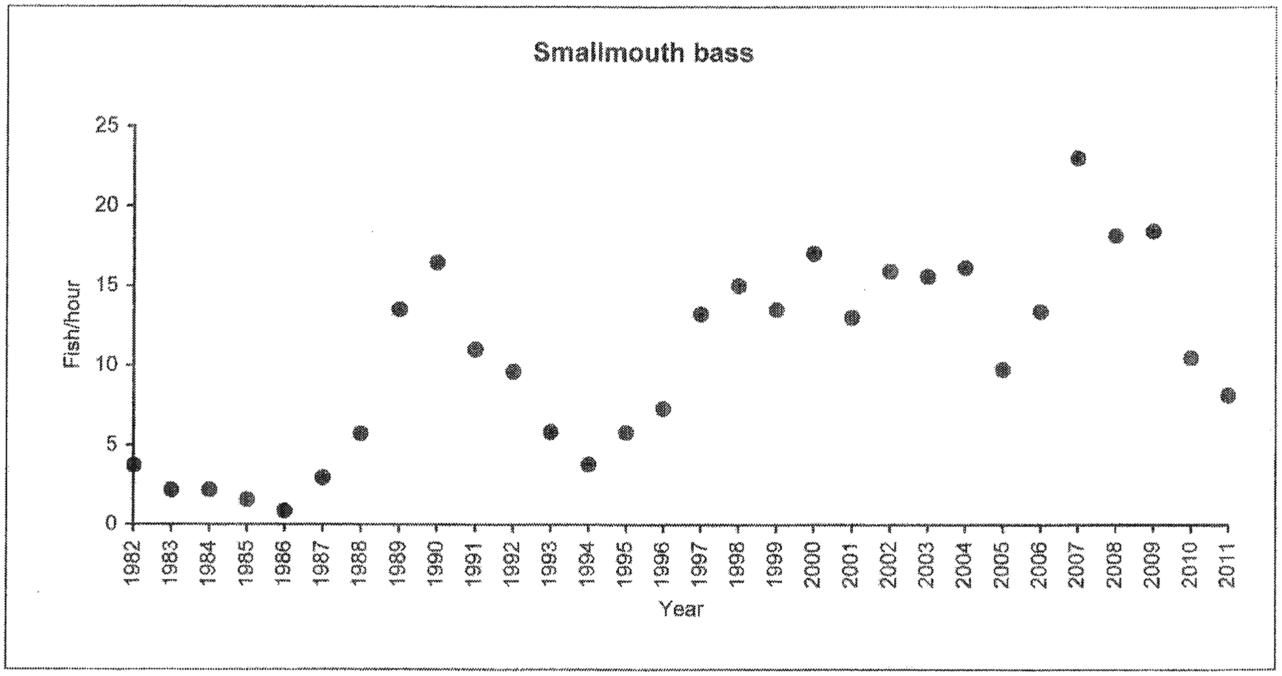


Figure 22. Electrofishing CPUE (fish/hour) for Largemouth bass for years 1982-2011 in the vicinity of PINGP.

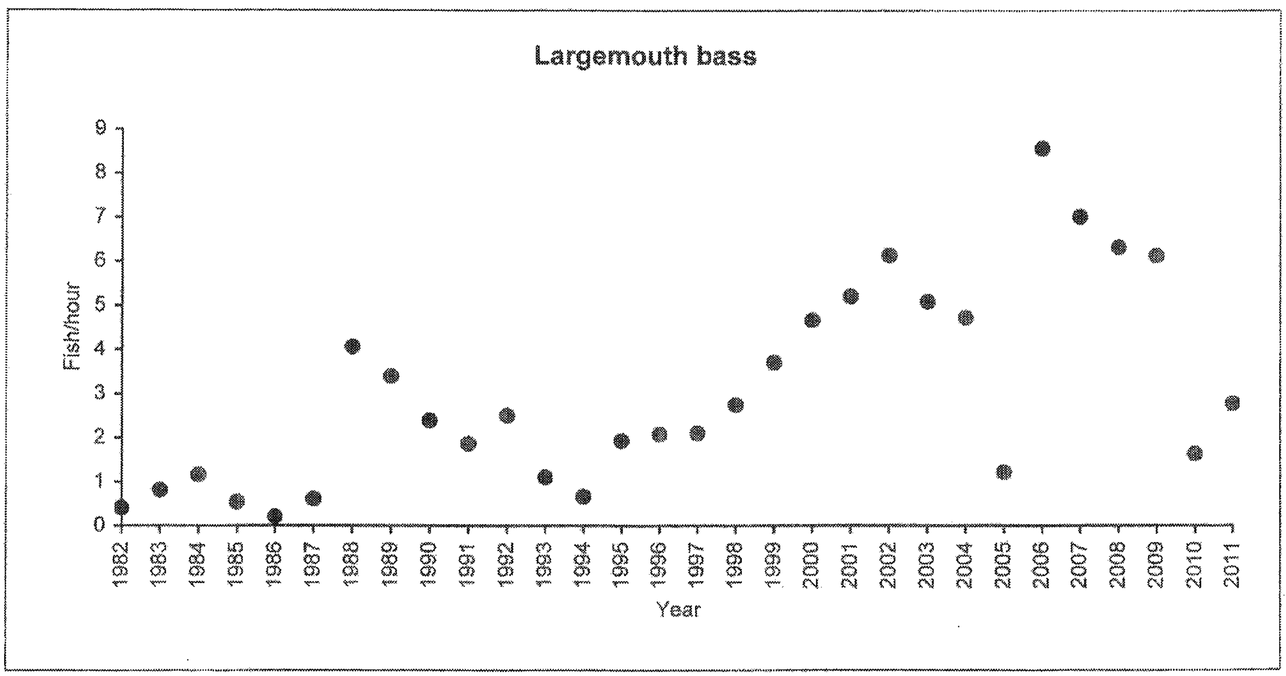
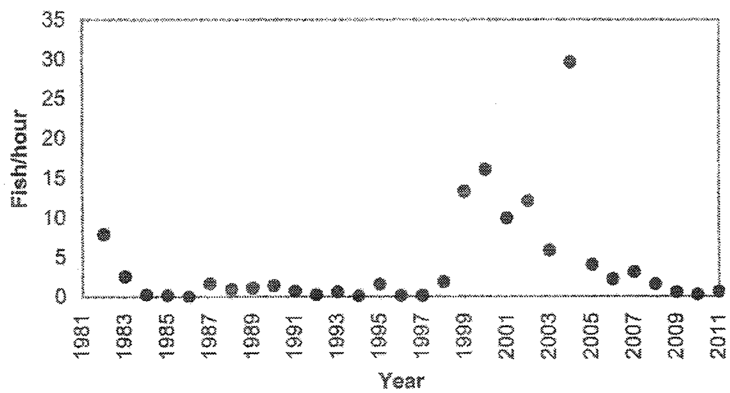
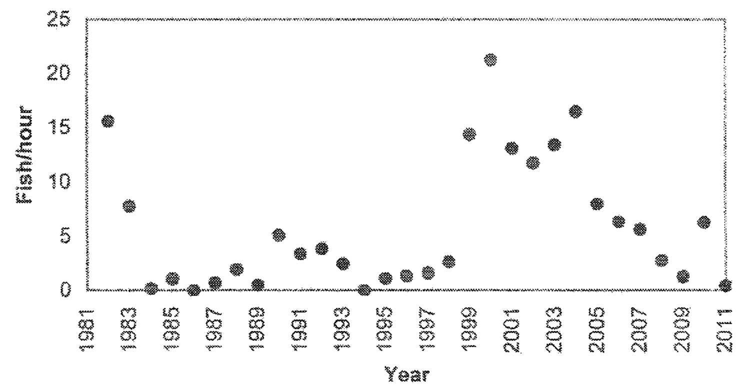


Figure 23. Electrofishing CPUE (fish/hour) by sector for Gizzard shad for years 1982-2011 in the vicinity of PINGP.

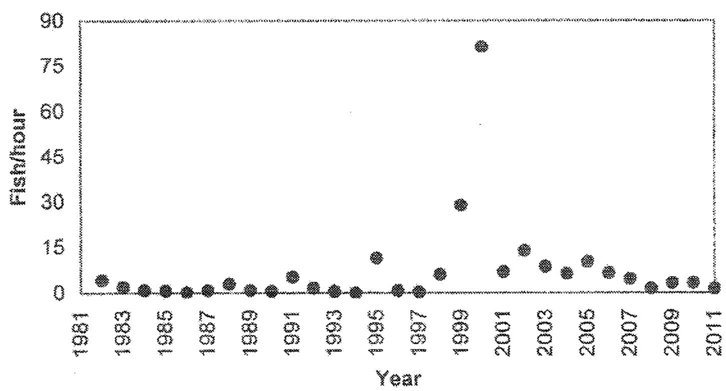
Sector 1



Sector 2



Sector 3



Sector 4

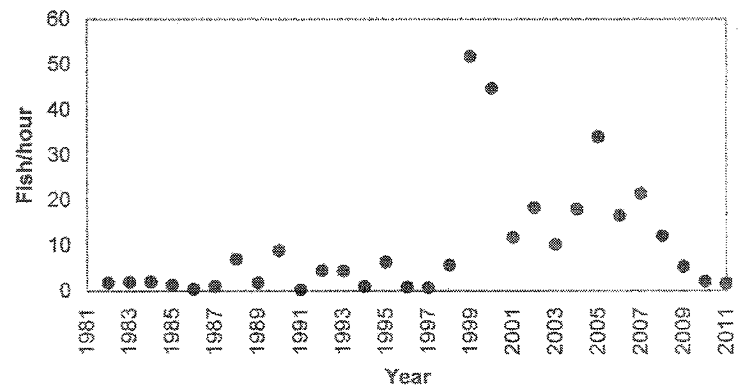


Figure 24. Electrofishing CPUE (fish/hour) by sector for Freshwater drum for years 1982-2011 in the vicinity of PINGP.

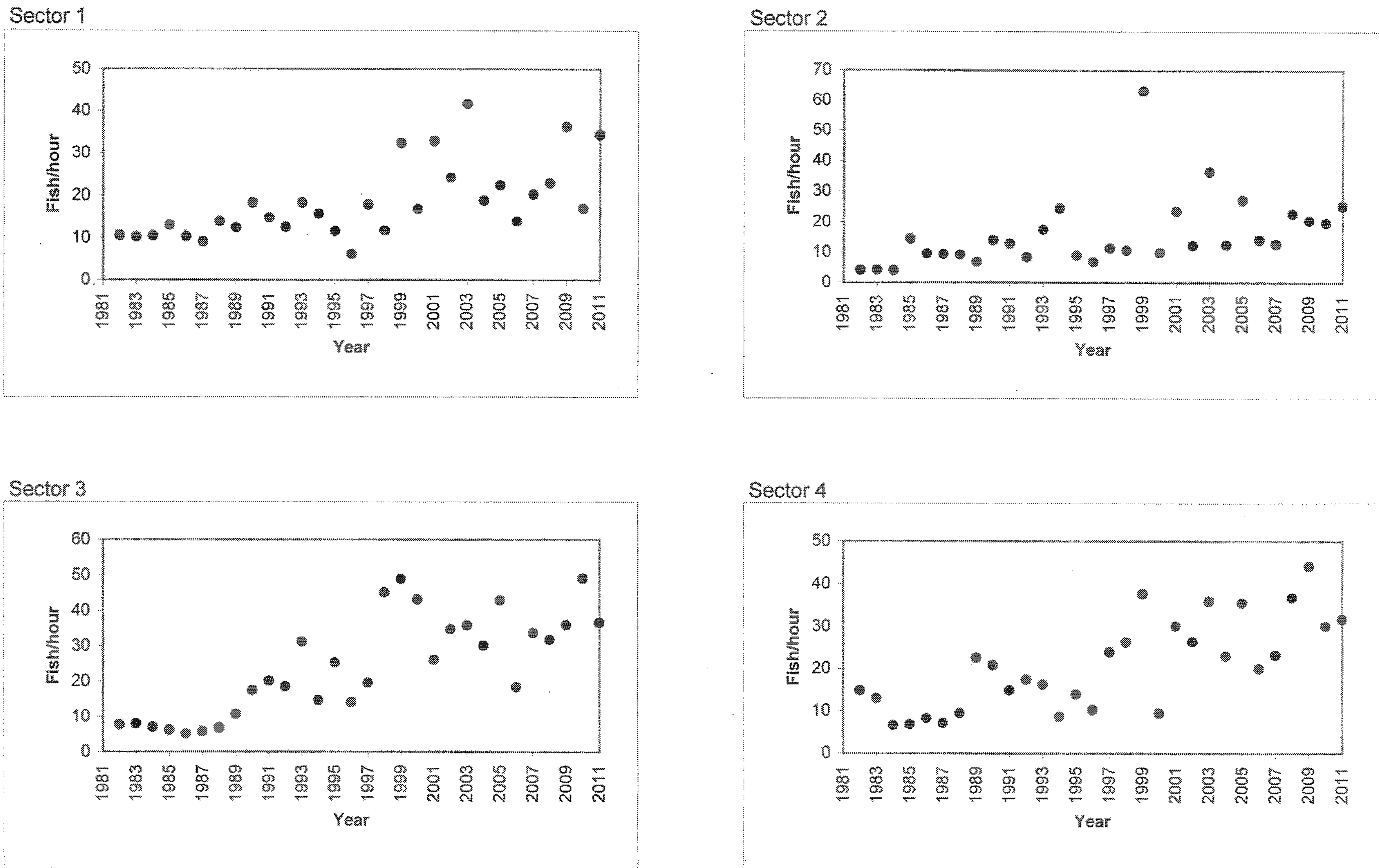


Figure 25. Electrofishing CPUE (fish/hour) by sector for Shorthead redhorse for the years 1982-2011 in the vicinity of PINGP.

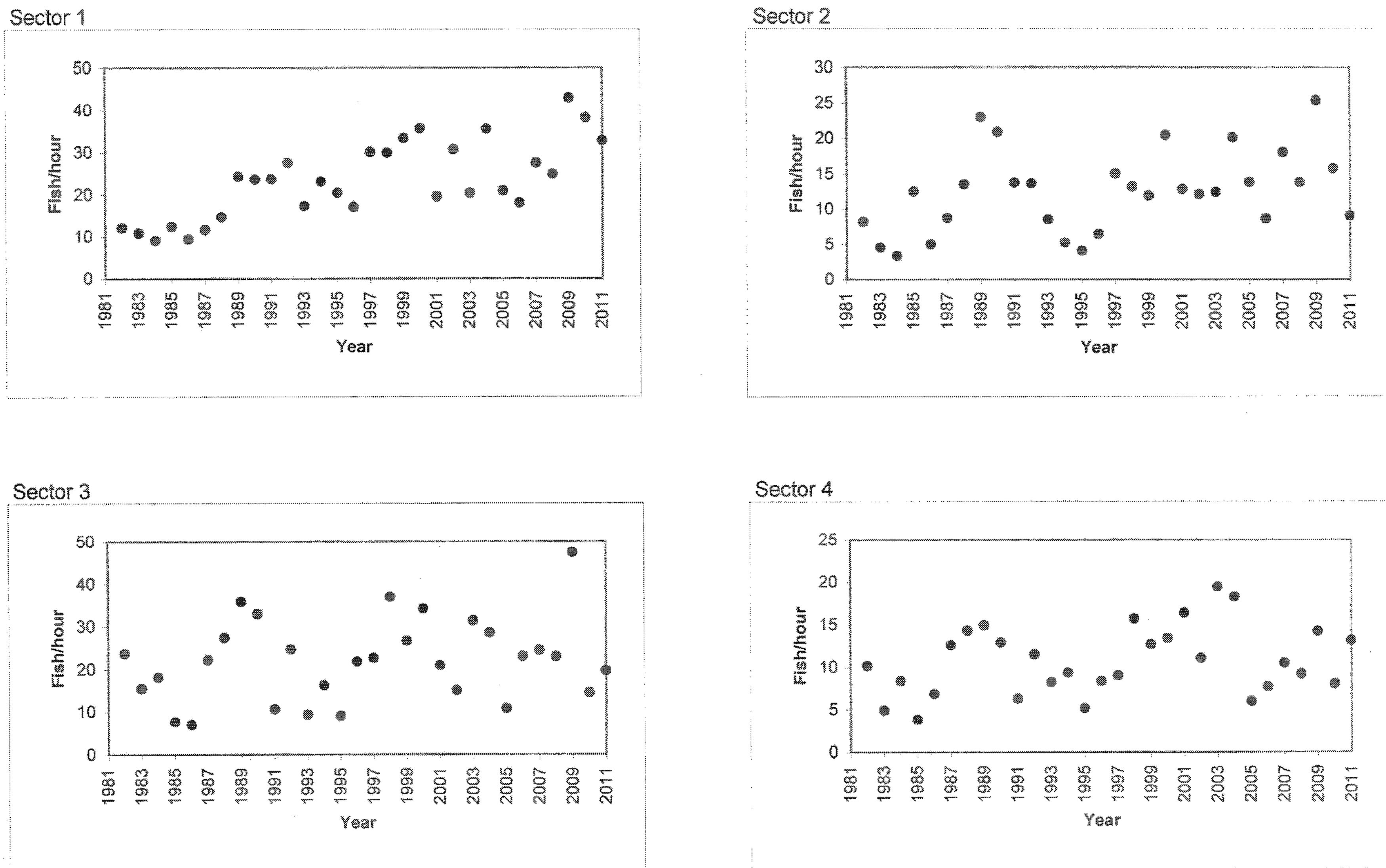


Figure 26. Electrofishing CPUE (fish/hour) by sector for White bass for years 1982-2011 in the vicinity of PINGP.

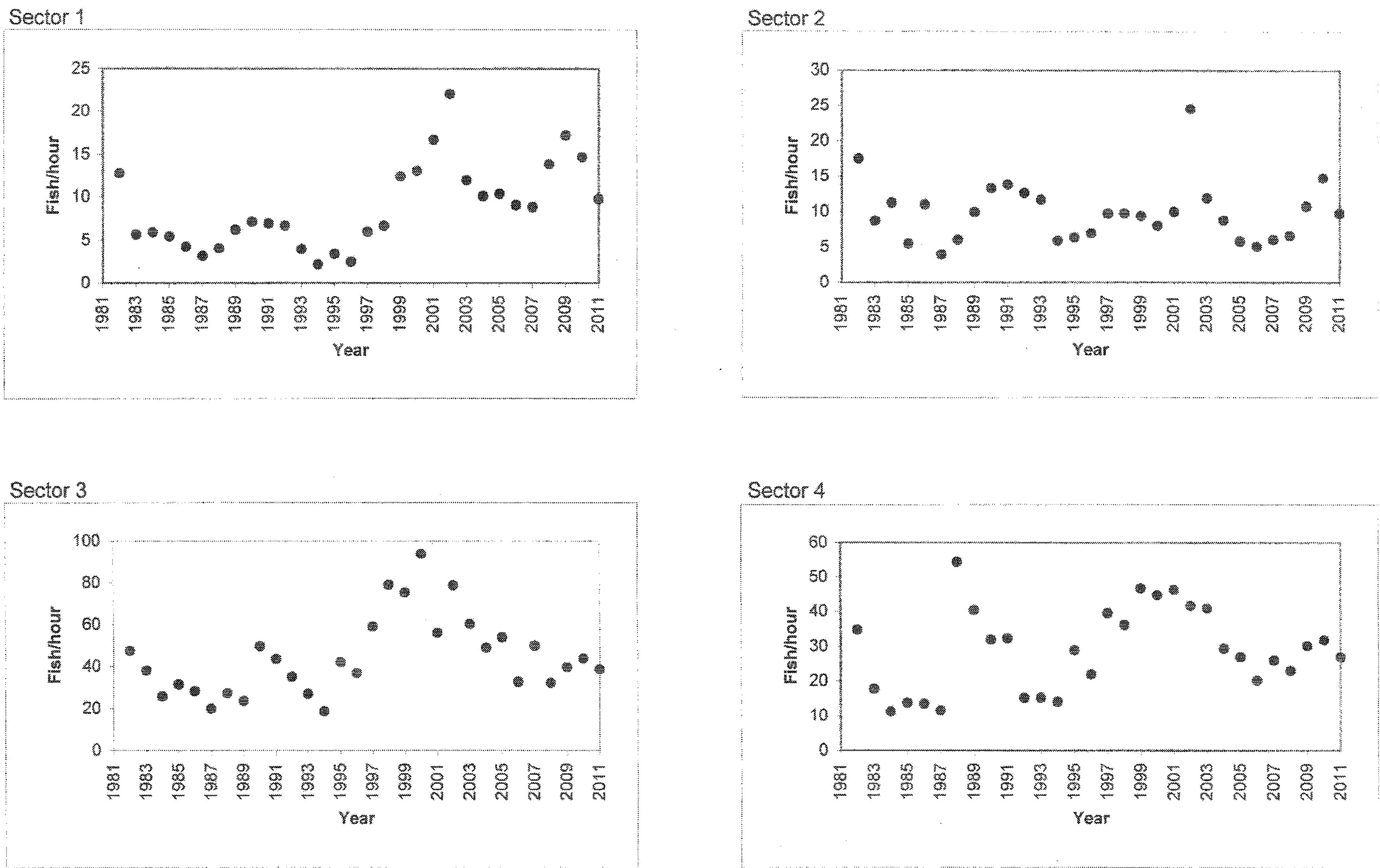
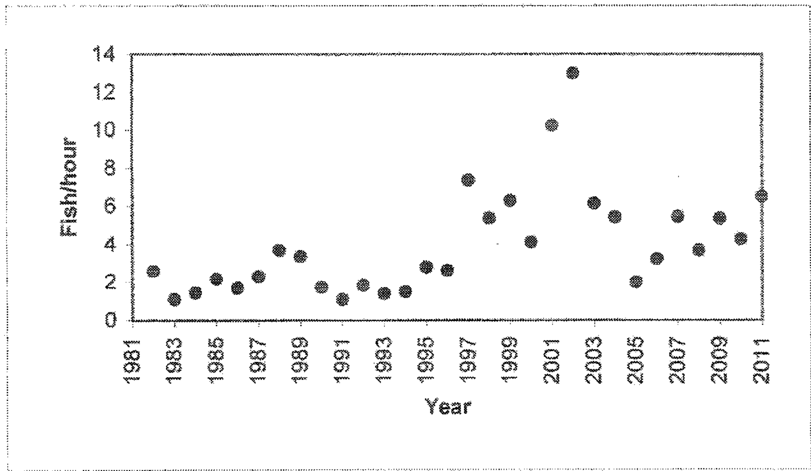
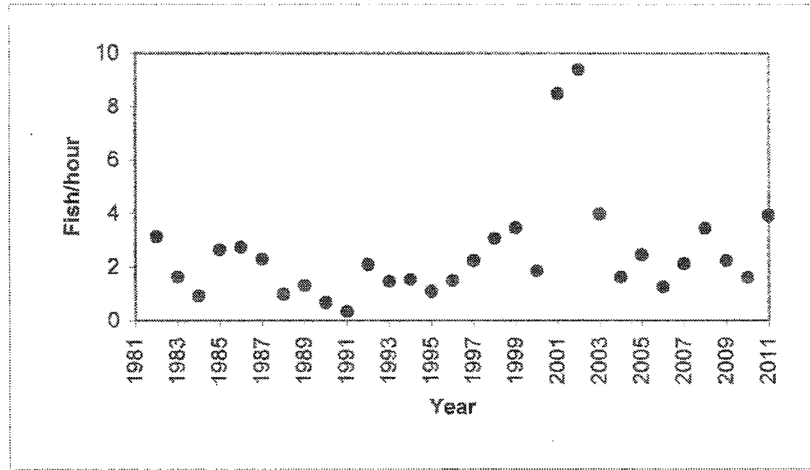


Figure 27. Electrofishing CPUE (fish/hour) by sector for Walleye for years 1982-2011 in the vicinity of PINGP.

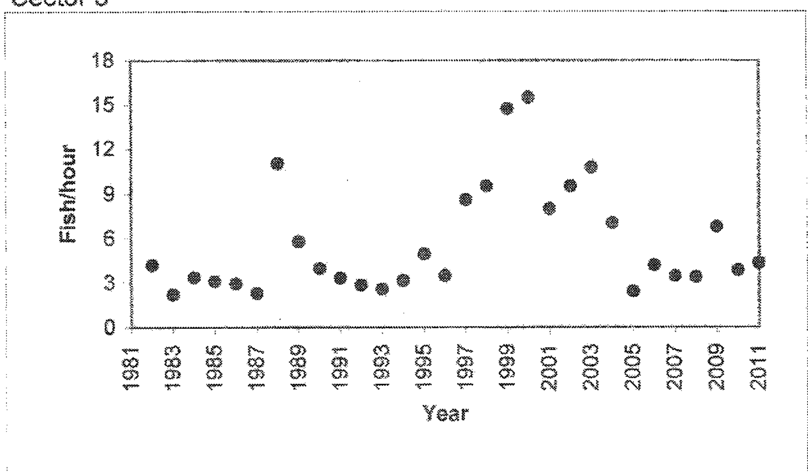
Sector 1



Sector 2



Sector 3



Sector 4

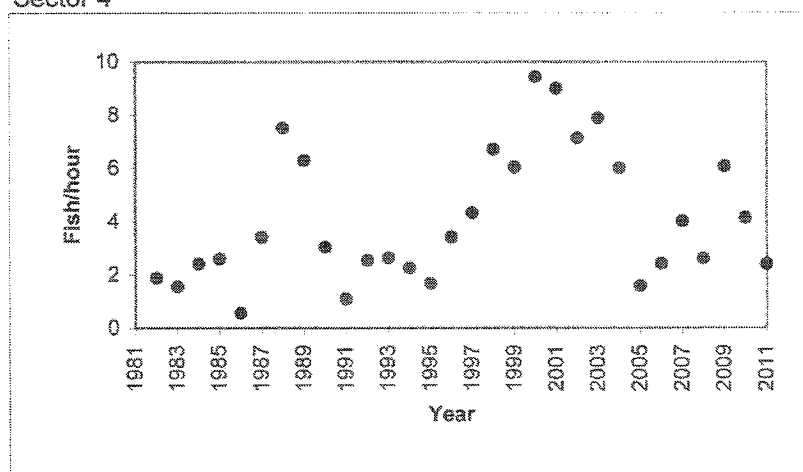


Figure 28. Electrofishing CPUE (fish/hour) by sector for Sauger for years 1982-2011 in the vicinity of PINGP

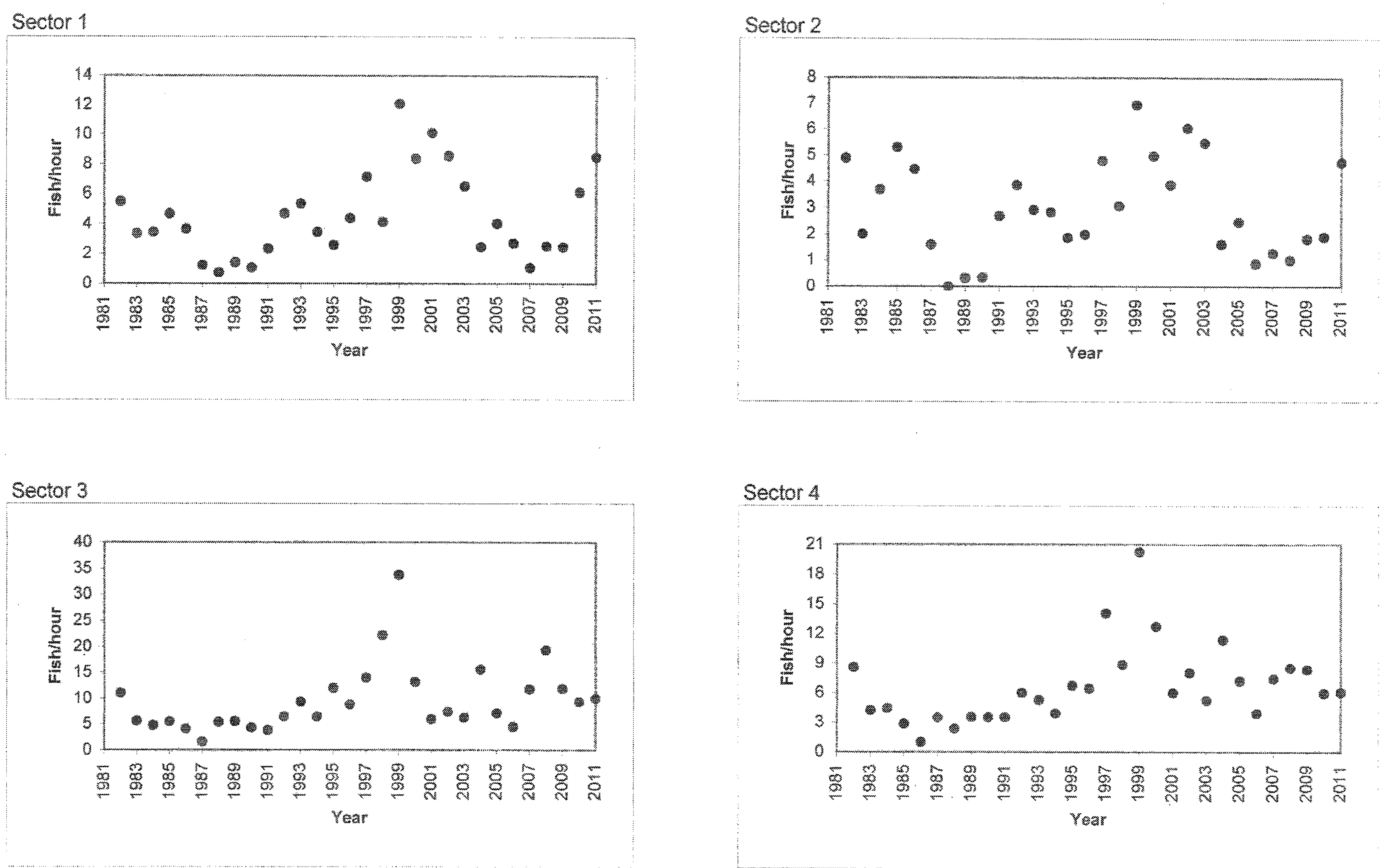
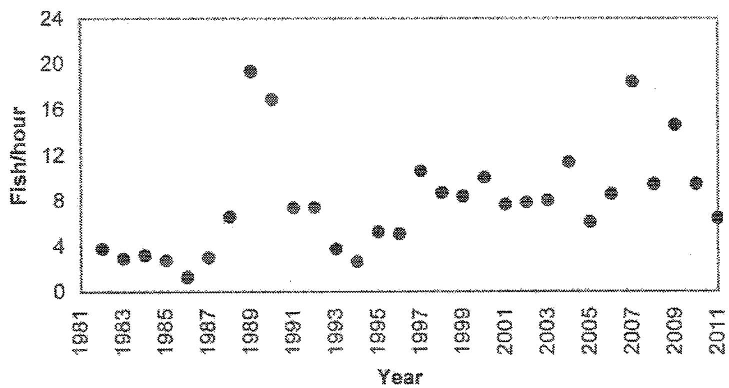
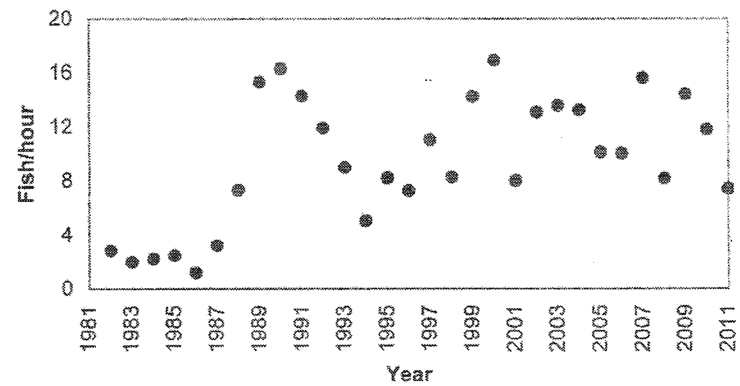


Figure 29. Electrofishing CPUE (fish/hour) by sector for Smallmouth bass for years 1982-2011 in the vicinity of PINGP.

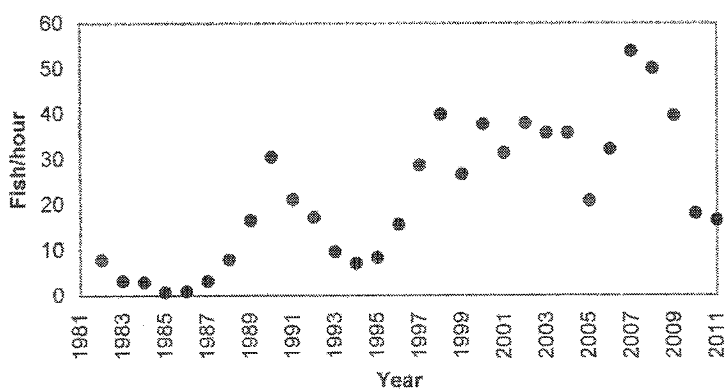
Sector 1



Sector 2



Sector 3



Sector 4

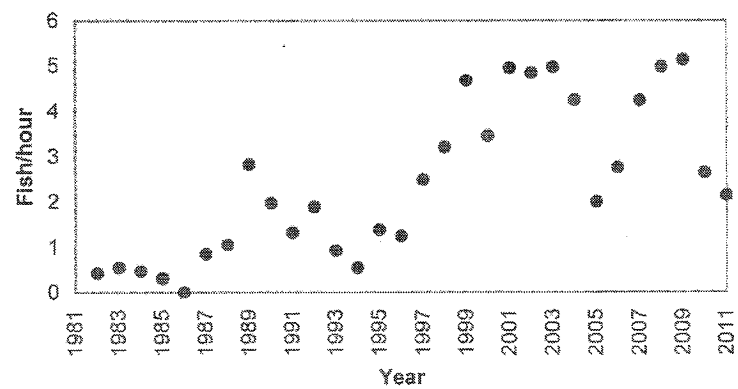
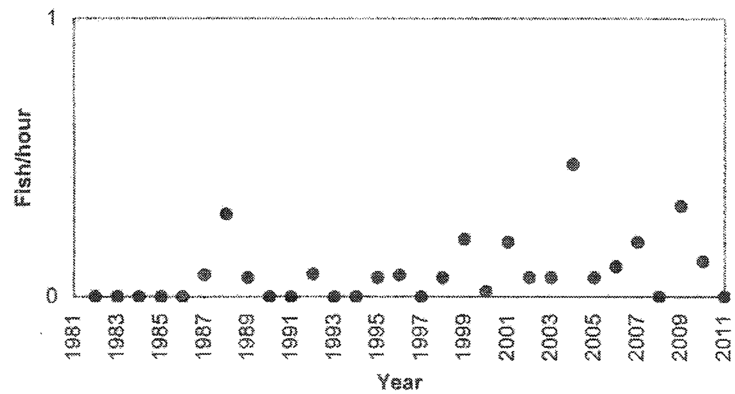
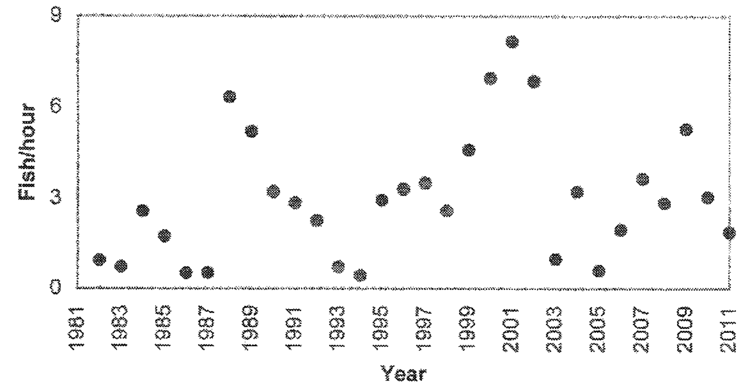


Figure 30. Electrofishing CPUE (fish/hour) by sector for Largemouth bass for years 1982-2011 in the vicinity of PINGP.

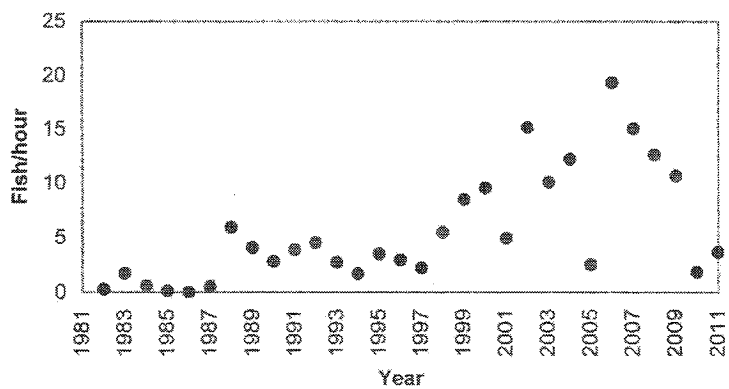
Sector 1



Sector 2



Sector 3



Sector 4

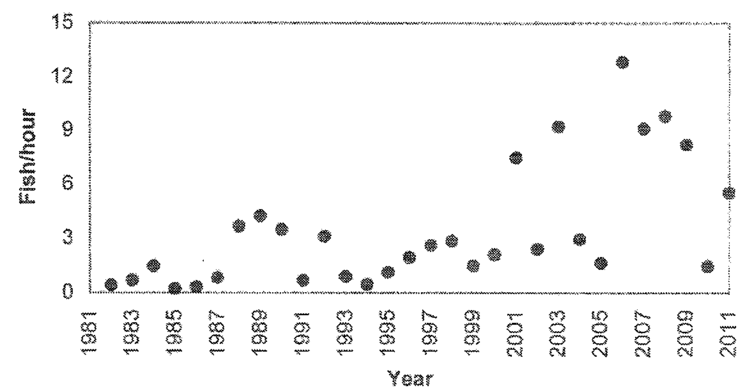
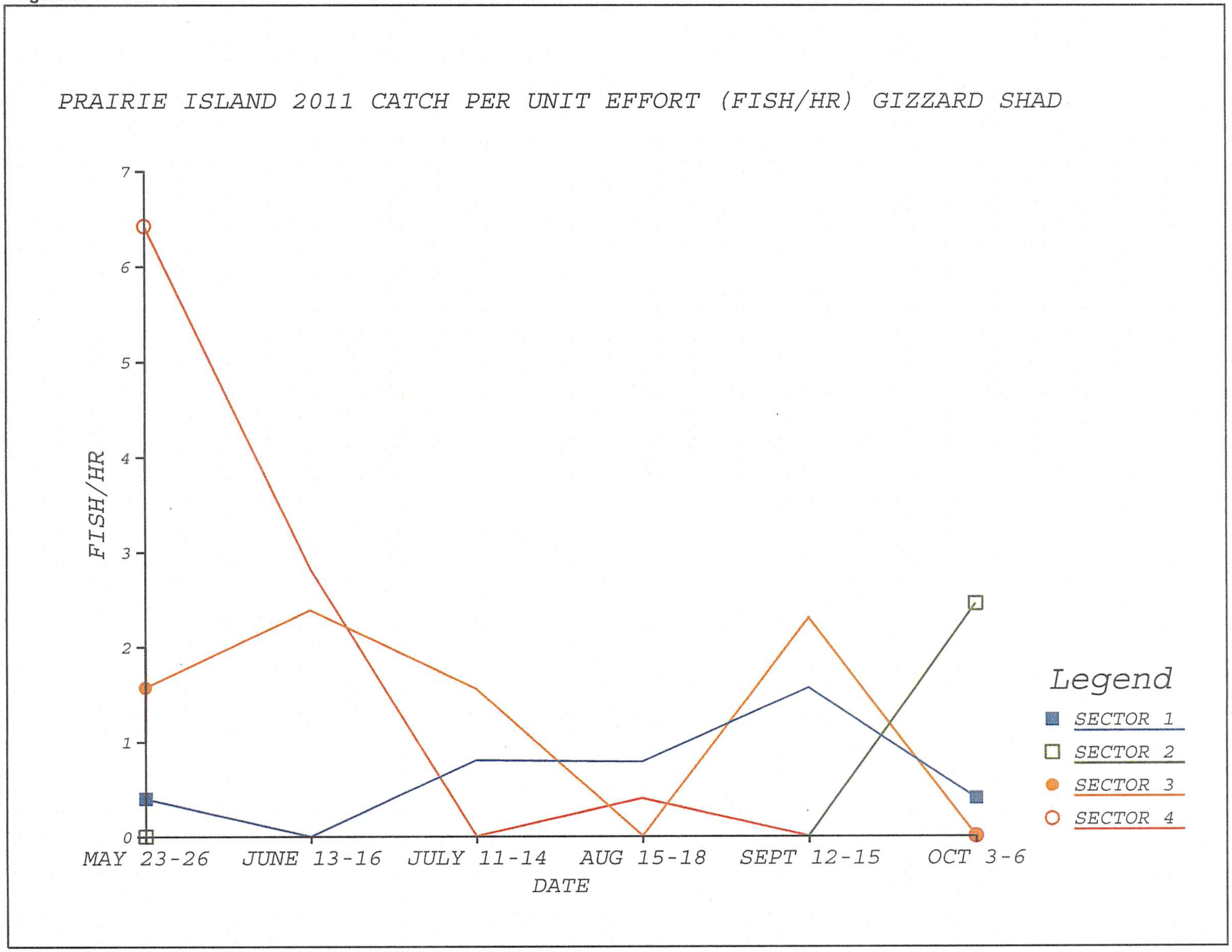
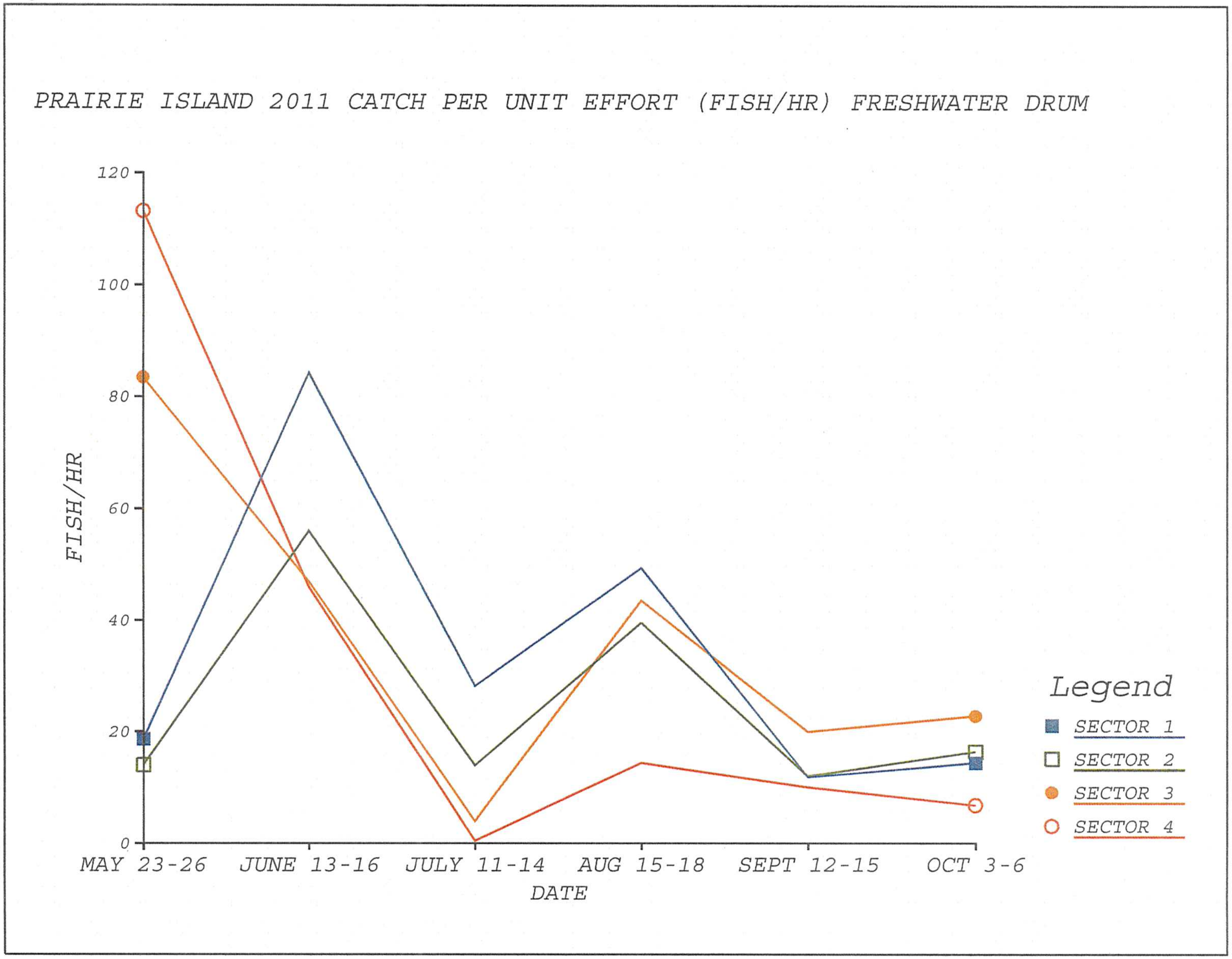


Figure 31



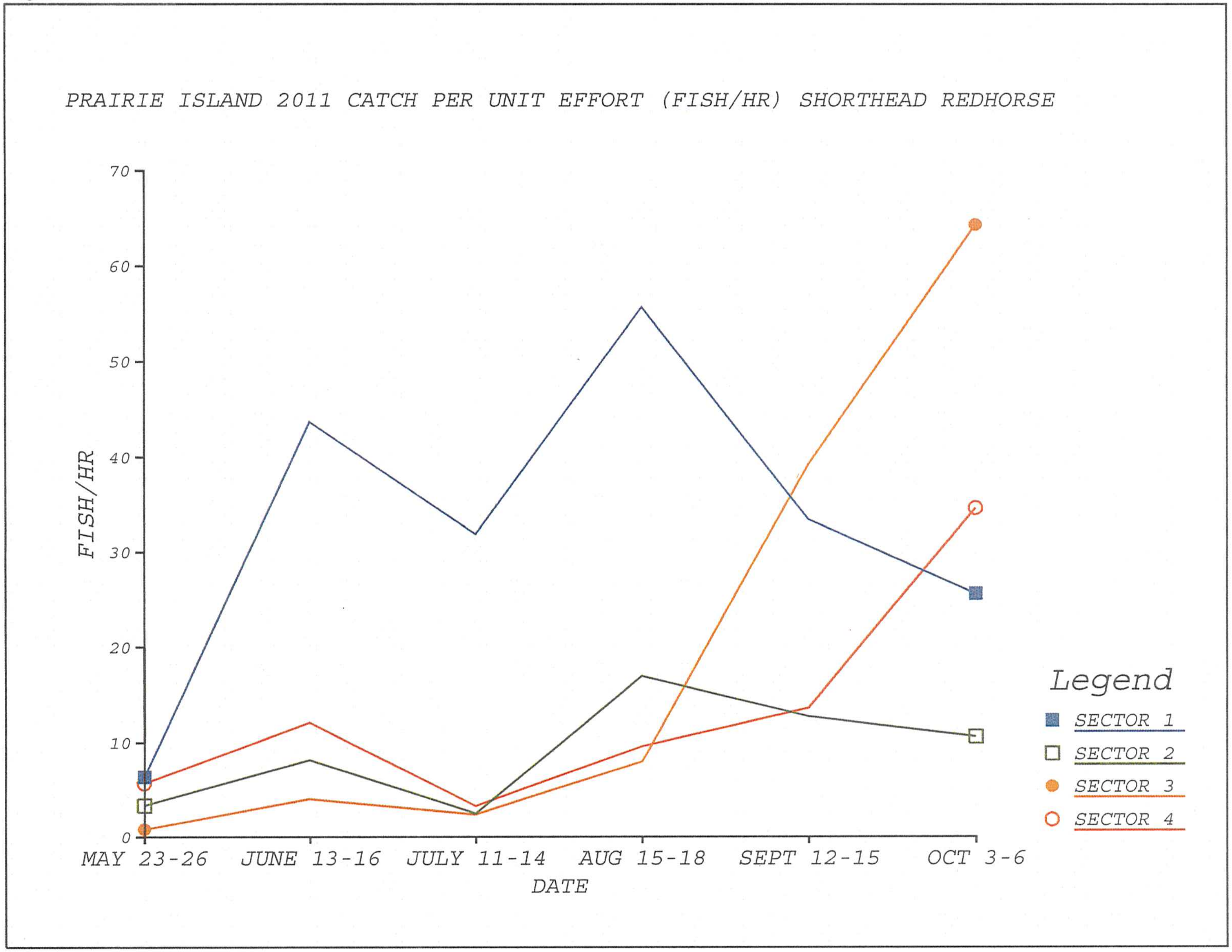
PRAIRIE ISLAND 2011 CATCH PER UNIT EFFORT (FISH/HR) GIZZARD SHAD
FISH/HR
0
1
2
3
4
5
6
7
MAY 23-26
JUNE 13-16
JULY 11-14
AUG 15-18
SEPT 12-15
OCT 3-6
DATE
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 32



PRAIRIE ISLAND 2011 CATCH PER UNIT EFFORT (FISH/HR) FRESHWATER DRUM
FISH/HR
120
100
80
60
40
20
0
MAY 23-26
JUNE 13-16
JULY 11-14
AUG 15-18
SEPT 12-15
OCT 3-6
DATE
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 33



PRAIRIE ISLAND 2011 CATCH PER UNIT EFFORT (FISH/HR) SHORTHEAD REDHORSE
FISH/HR
70
60
50
40
30
20
10
0
MAY 23-26
JUNE 13-16
JULY 11-14
AUG 15-18
SEPT 12-15
OCT 3-6
DATE
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 34

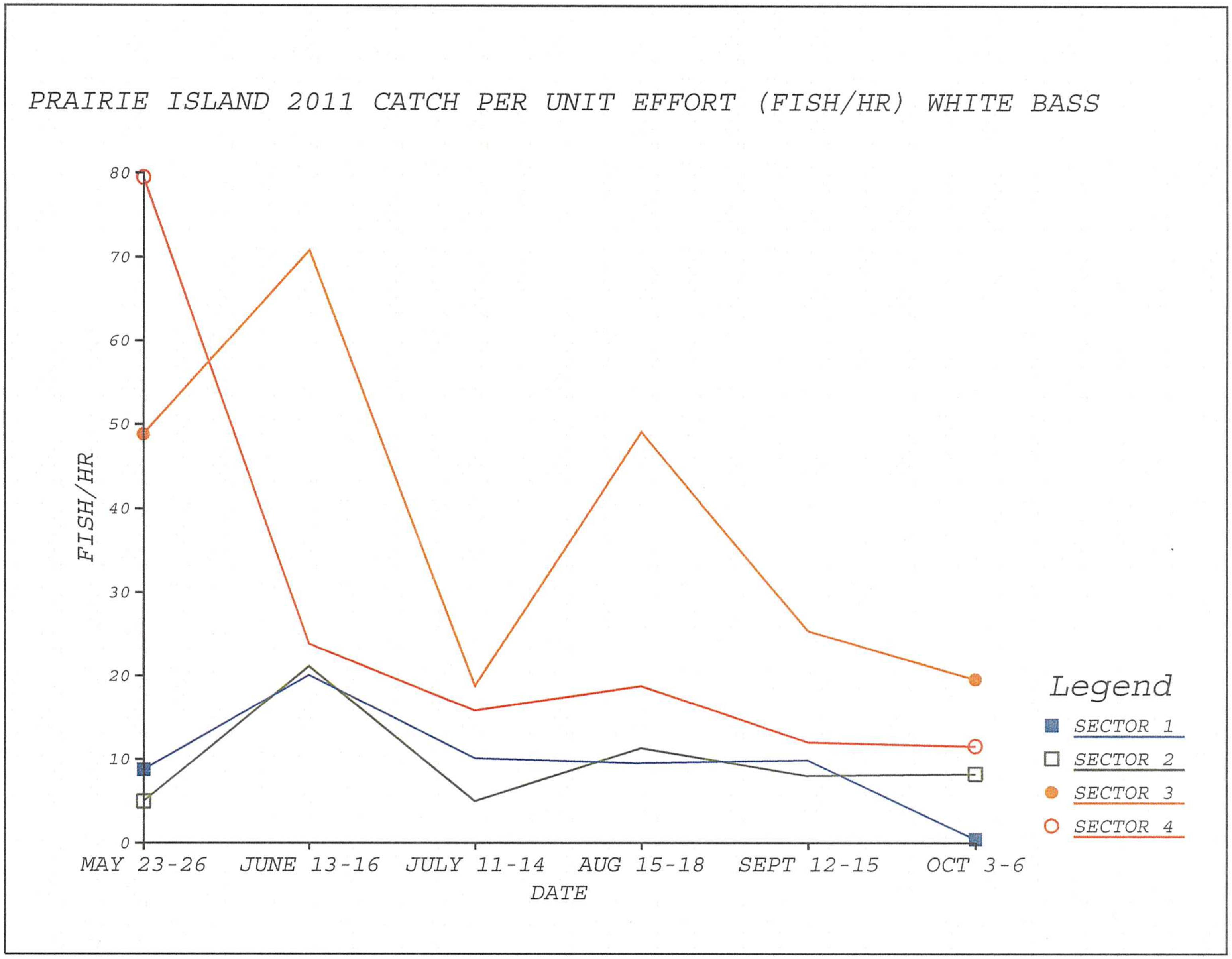
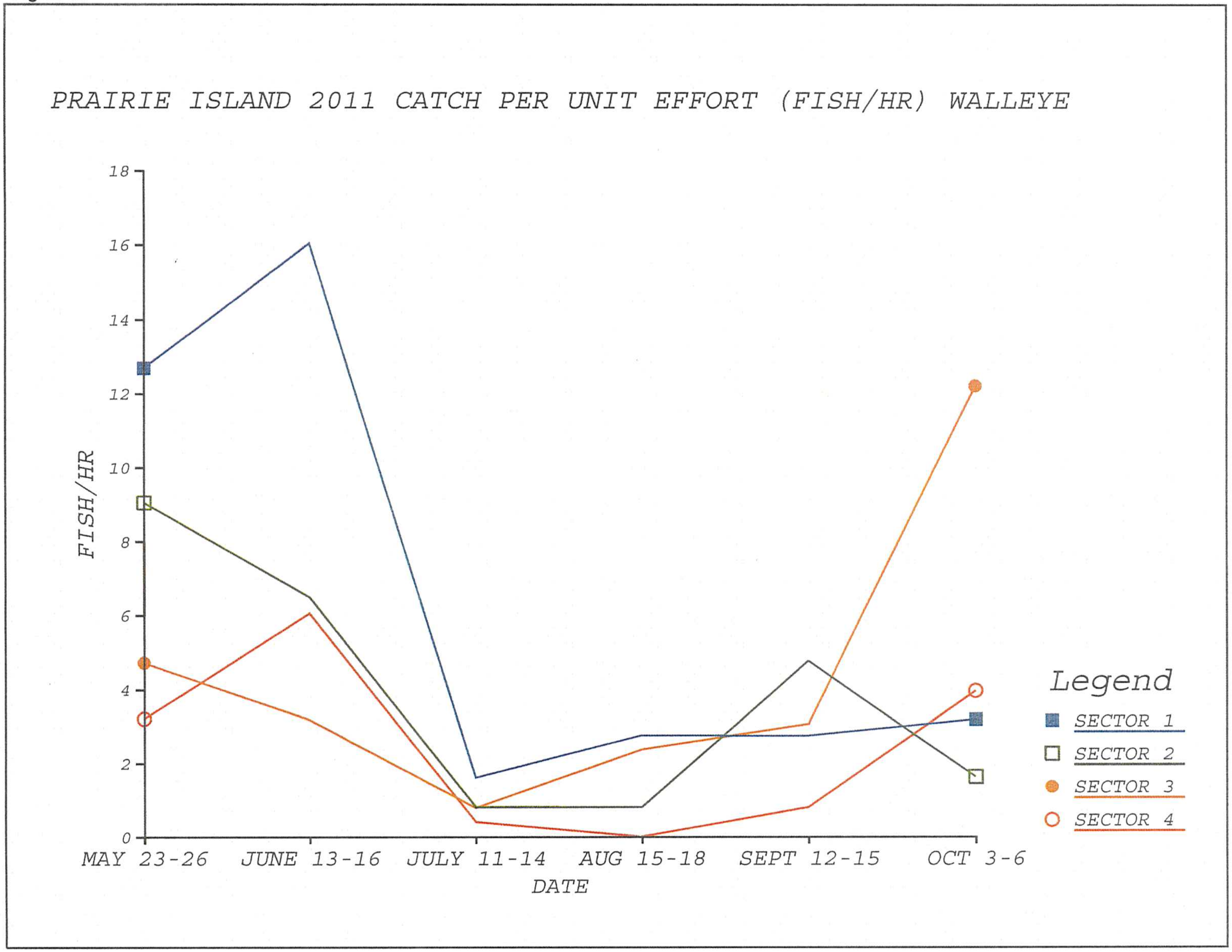

PRAIRIE ISLAND 2011 CATCH PER UNIT EFFORT (FISH/HR) WHITE BASS
FISH/HR
0
10
20
30
40
50
60
70
80
MAY 23-26
JUNE 13-16
JULY 11-14
AUG 15-18
SEPT 12-15
OCT 3-6
DATE
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 35



PRAIRIE ISLAND 2011 CATCH PER UNIT EFFORT (FISH/HR) WALLEYE
FISH/HR
18
16
14
12
10
8
6
4
2
0
MAY 23-26
JUNE 13-16
JULY 11-14
AUG 15-18
SEPT 12-15
OCT 3-6
DATE
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 36

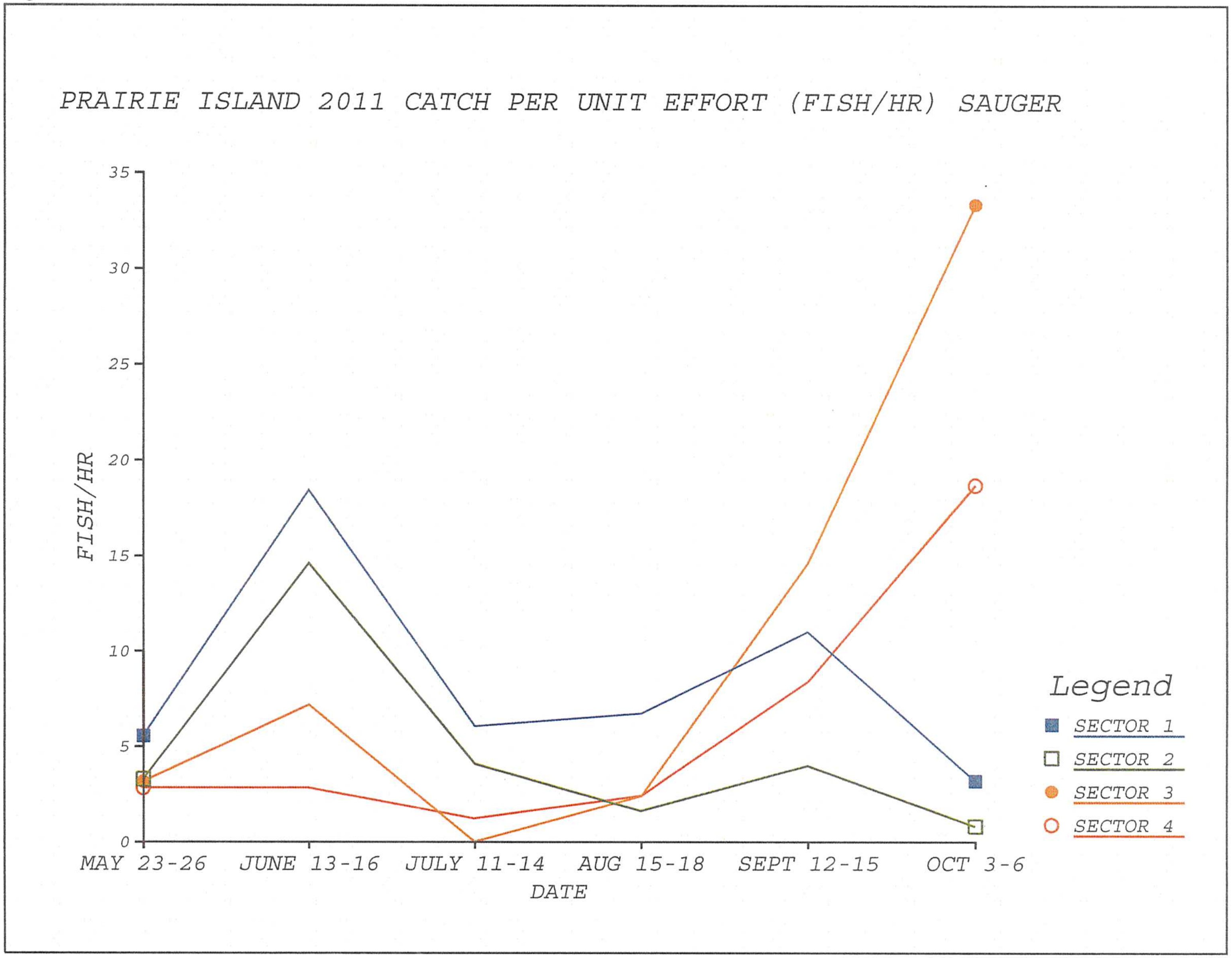

PRAIRIE ISLAND 2011 CATCH PER UNIT EFFORT (FISH/HR) SAUGER
FISH/HR
35
30
25
20
15
10
5
0
MAY 23-26
JUNE 13-16
JULY 11-14
AUG 15-18
SEPT 12-15
OCT 3-6
DATE
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 37

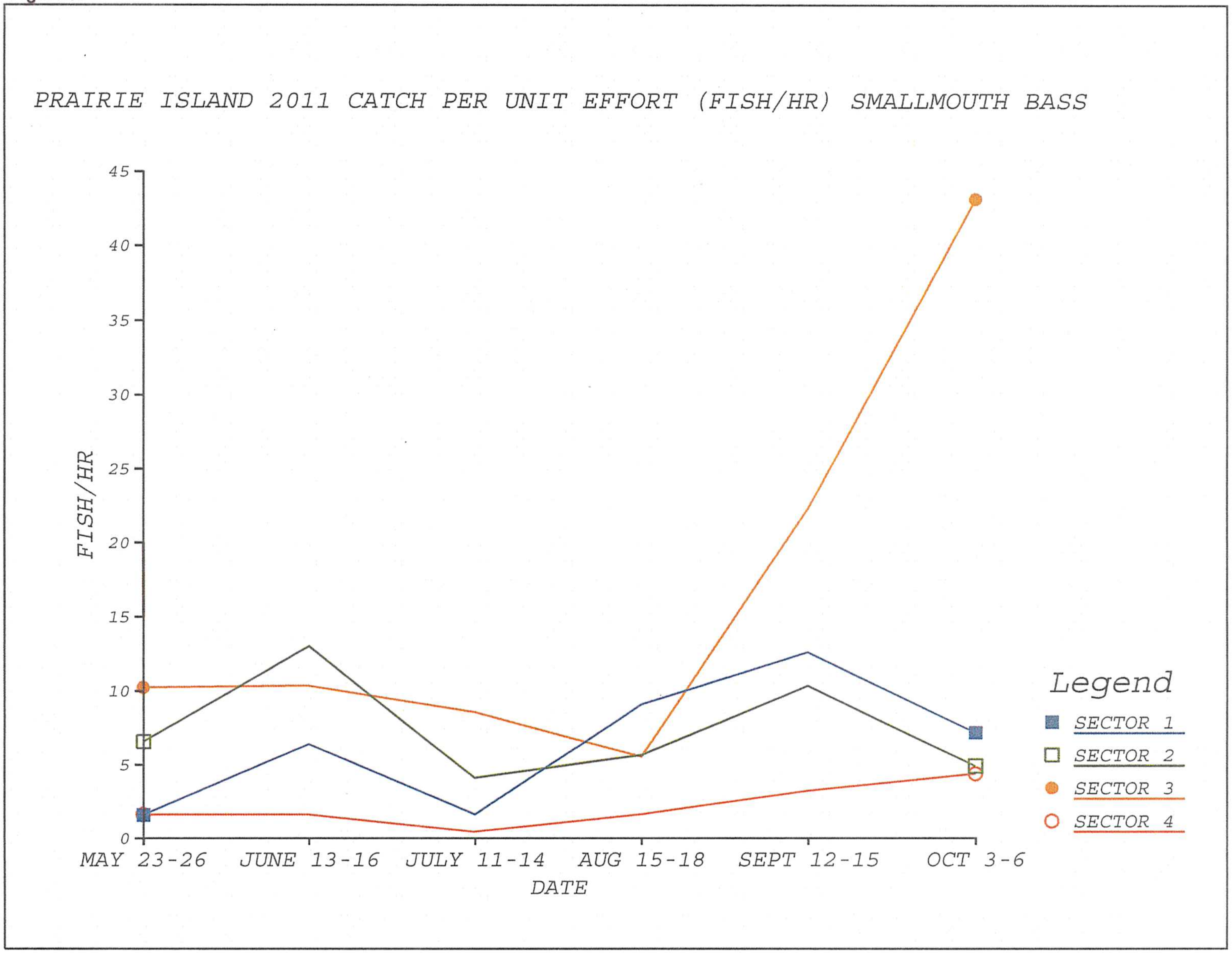

PRAIRIE ISLAND 2011 CATCH PER UNIT EFFORT (FISH/HR) SMALLMOUTH BASS
FISH/HR
45
40
35
30
25
20
15
10
5
0
MAY 23-26
JUNE 13-16
JULY 11-14
AUG 15-18
SEPT 12-15
OCT 3-6
DATE
Legend
SECTOR 1
SECTOR 2
SECTOR 3
SECTOR 4

Figure 38

PRAIRIE ISLAND 2011 CATCH PER UNIT EFFORT (FISH/HR) LARGEMOUTH BASS

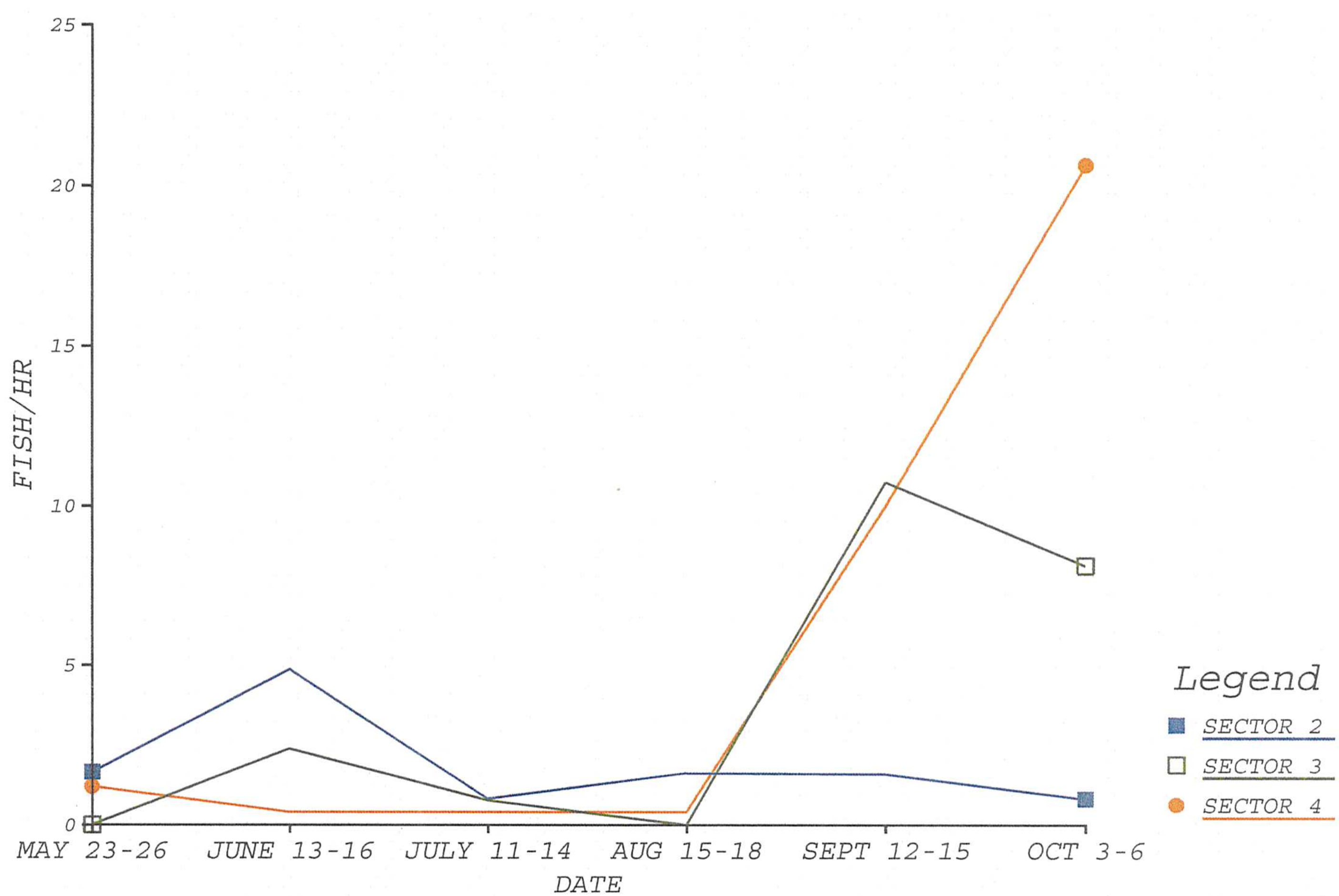


Table 1. Species of fish captured In the Mississippi River in the vicinity of the Prairie Island Nuclear Generating Plant 1983-2011.

Species	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	OO	O1	O2	O3	O4	O5	O6	O7	O8	O9	10	11
Chestnut lamprey	x	x							x	x			x			x	x		x	x	x			x					x
Ichthyomyzon castaneus																													
Silver lamprey					x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Icthyomyzon unicuspus																													
Paddlefish															x								x						
Polyodon spathula																													
Longnose gar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Lepisosteus osseus																													
Shortnose gar	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Lepisosteus platostomus																													
Bowfin	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Amia calva																													
American eel	x	x		x	x	x	x	x	x	x	x	x	x	x			x	x		x			x					x	
Anguilla rostrata																													
Gizzard shad	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Dorosoma cepedianum																													
Goldeye	x		x		x	x					x			x	x	x	x				x	x	x			x		x	
Hiodon alosoides																													
Mooneye	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Hiodon tergisus																													
Brown trout				x									x		x		x		x	x	x		x	x		x	x		
Salmo trutta																													
Northern pike	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Esox lucius																													
Musky																		x	x			x			x				x
Esox masquinongy																													
Carp	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Cyprinus carpio																													
Carpsucker Species		x					x																						
Carpiodes species																													
River carpsucker	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Carpiodes carpio																													
Quillback	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Carpiodes cyprinus																													
Highfin carpsucker			x	x	x	x	x	x	x	x	x	x	x	x	x					x	x	x	x		x		x	x	
Carpiodes velifer																													

Table 1 (cont.) Species of fish captured In the Mississippi River in the vicinity of the Prairie Island Nuclear Generating Plant 1983-2011.

Species	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	OO	O1	O2	O3	O4	O5	O6	O7	O8	O9	10	11
White sucker	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x		x		x	x	x	
Catostomus commersoni																													
Blue sucker	x			x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Cycleptus elongatus																													
Northern hogsucker	x														x			x							x	x	x		
Hypentelium nigricans																													
Smallmouth buffalo	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ictiobus bubalus																													
Bigmouth buffalo	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ictiobus cyprinellus																													
Black buffalo																												x	x
Ictiobus niger																													
Spotted sucker	x	x		x		x	x			x												x	x	x					
Minytrema melanops																													
Silver redhorse	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Moxostoma anisurum																													
River redhorse		x	x		x		x	x	x	x		x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x
Moxostoma carinatum																													
Golden redhorse	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Moxostoma erythrurum																													
Greater redhorse		x		x		x		x							x	x			x		x								
Moxostoma valenciennesi																													
Shorthead redhorse	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Moxostoma macrolepidotum																													
Black bullhead	x	x	x	x	x	x				x							x	x		x								x	
Ictalurus melas																													
Yellow bullhead					x	x	x					x	x														x		x
Ictalurus natalis																													
Brown bullhead	x																												
Ictalurus nebulosus																													
Channel catfish	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ictalurus punctatus																													
Flathead catfish	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pylodictus olivaris																													
Burbot	x	x			x					x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x
Lota lota																													

Table 1 (cont.) Species of fish captured In the Mississippi River in the vicinity of the Prairie Island Nuclear Generating Plant 1983-2011.

Species	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	OO	O1	O2	O3	O4	O5	O6	O7	O8	O9	10	11
White bass	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Marone chrysops																													
Rock bass	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ambloplites rupestris																													
Green sunfish	x	x			x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Lepomis cyanellus																													
Pumpkinseed							x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Lepomis gibbosus																													
Orangespotted sunfish																x		x	x			x		x	x		x		x
Lepomis humilis																													
Bluegill	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Lepomis macrochirus																													
Smallmouth bass	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Micropterus dolomieui																													
Largemouth bass	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Micropterus salmoides																													
White crappie	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pomoxis annularis																													
Black crappie	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pomoxis nigromaculatus																													
Yellow perch	x	x	x		x	x	x	x	x	x	x	x	x		x	x	x		x	x	x	x	x	x	x	x	x	x	x
Perca flavens																													
Sauger	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sander canadense																													
Walleye	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sander vitreus																													
Saugeye															x	x	x		x	x	x	x	x		x				x
S. vitreum x S. canadense																													
Freshwater drum	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Aplodinotus grunniens																													
Lake sturgeon																					x				x				
Acipenser fulvescens																													
Bluegill x Greensunfish																									x		x	x	x
L. macrochirus x L. cyanellus																													
Greensunfish x Pumpkinseed																									x				
L. cyanellus x L. gibbosus																													

Table 2. Electrofishing CPUE (fish/hour) for each sector in the vicinity of PINGP and total number of each species collected during 2011. Species are listed in descending order according to average CPUE.

Rank	Species	Sector 1	Sector 2	Sector 3	Sector 4	Average	Number collected
1	Freshwater drum	34.38	25.31	36.68	31.73	32.03	1459
2	White bass	9.76	9.75	38.66	26.85	21.26	915
3	Shorthead redhorse	32.78	9.07	19.59	13.16	18.65	907
4	Carp	8.49	8.66	21.83	10.55	12.38	516
5	Smallmouth bass	6.44	7.44	16.57	2.14	8.15	310
6	Sauger	8.49	4.74	9.99	6.08	7.33	330
7	Bluegill	0.47	11.10	7.10	4.34	5.75	208
8	Silver redhorse	6.90	4.47	2.24	5.88	4.87	242
9	Walleye	6.50	3.93	4.34	2.41	4.29	196
10	Quillback	4.05	4.60	2.63	3.01	3.57	160
11	Largemouth bass	0.00	1.90	3.68	5.54	2.78	125
12	Smallmouth buffalo	1.39	3.52	1.32	0.60	1.71	66
13	Flathead catfish	0.73	2.44	2.10	1.27	1.63	64
14	Black crappie	0.86	2.17	0.66	2.61	1.57	73
15	Longnose gar	1.06	2.03	0.66	0.27	1.00	40
16	Gizzard shad	0.66	0.41	1.32	1.60	1.00	47
17	Channel catfish	0.66	1.76	0.39	0.40	0.80	32
18	Bowfin	0.00	0.14	1.32	1.74	0.80	37
19	River carpsucker	0.33	1.35	0.92	0.47	0.77	29
20	Bigmouth buffalo	0.27	0.68	0.66	1.20	0.70	32
21	Mooneye	1.00	0.14	0.39	1.00	0.63	34
22	Shortnose gar	0.40	0.27	0.92	0.20	0.45	18
23	Green sunfish	0.00	1.35	0.26	0.07	0.42	13
24	Northern pike	0.20	0.00	0.53	0.74	0.37	18
25	Rock bass	0.60	0.81	0.00	0.00	0.35	15
26	Yellow perch	0.07	0.54	0.13	0.40	0.28	12
27	White crappie	0.07	0.27	0.00	0.20	0.13	6
28	Silver lamprey	0.13	0.00	0.26	0.13	0.13	6
29	Golden redhorse	0.27	0.00	0.13	0.07	0.12	6
30	Blue sucker	0.00	0.00	0.26	0.20	0.12	5
31	Pumpkinseed	0.00	0.27	0.00	0.07	0.08	3
32	BG x GSF	0.00	0.14	0.13	0.07	0.08	3
33	Yellow bullhead	0.00	0.27	0.00	0.00	0.07	2
34	Chestnut lamprey	0.00	0.14	0.13	0.00	0.07	2
35	River redhorse	0.13	0.00	0.00	0.07	0.05	3
36	Black buffalo	0.07	0.00	0.13	0.00	0.05	2
37	Musky	0.00	0.14	0.00	0.00	0.03	1
38	Orangespotted sunfish	0.00	0.14	0.00	0.00	0.03	1
39	Burbot	0.00	0.00	0.13	0.00	0.03	1
40	Saugeye	0.07	0.00	0.00	0.00	0.02	1
	Totals	127.22	109.91	176.06	125.04	134.56	5940

Table 3. Fisheries summary for Gizzard shad 1977-2011.

YEAR	ELECTRO CPUE Fish/hr	TRAPNET CPUE Fish/hr	CATCH COMP (%)	N	MEAN LENGTH	LENGTH WEIGHT REGRESSION
1977	7.92	0.61	4	135	NA	LOG W=3.101 LOG L-5.163
1978	10.20	0.20	5	73	NA	LOG W=3.068 LOG L-5.078
1979	1.81	0.06	1	NA	NA	NA
1980	10.83	0.14	7	NA	NA	NA
1981	23.03	0.38	9	917	216	LOG W=2.748 LOG L-4.348
1982	7.39	0.09	3	276	329	LOG W=2.917 LOG L-4.741
1983	3.57	0.26	2	155	355	LOG W=3.029 LOG L-5.049
1984	0.84	0.08	1	48	281	LOG W=2.684 LOG L-4.171
1985	0.81	0.01	1	31	325	LOG W=2.388 LOG L-3.431
1986	0.14	0.06	<1	13	274	LOG W=3.248 LOG L-5.634
1987	1.08	0.05	1	55	256	LOG W=3.030 LOG L-5.046
1988	3.25	NA	3	139	288	LOG W=2.629 LOG L-4.015
1989	1.07	NA	<1	47	323	LOG W=3.025 LOG L-5.021
1990	3.99	NA	3	170	326	LOG W=2.956 LOG L-4.857
1991	2.39	NA	4	198	338	LOG W=2.601 LOG L-3.940
1992	1.82	NA	1.8	91	357	LOG W=3.459 LOG L-6.127
1993	1.99	NA	1.9	62	375	LOG W=2.920 LOG L-4.728
1994	0.28	NA	<1	14	394	LOG W=3.371 LOG L-5.955
1995	5.10	NA	4	204	272	LOG W=2.625 LOG L-4.073
1996	0.76	NA	<1	27	330	LOG W=3.275 LOG L-5.666
1997	0.66	NA	<1	23	400	LOG W=3.934 LOG L-7.373
1998	4.07	NA	2	176	260	LOG W=3.104 LOG L-5.218
1999	27.12	NA	12	1222	290	LOG W=2.981 LOG L-4.988
2000	40.85	NA	17	1634	290	LOG W=3.274 LOG L-5.697
2001	10.43	NA	6	455	340	LOG W=3.767 LOG L-6.967
2002	14.02	NA	7	612	350	LOG W=3.200 LOG L-5.518
2003	9.51	NA	5	373	380	LOG W=3.469 LOG L-6.198
2004	17.60	NA	10	859	290	LOG W=2.863 LOG L-4.607
2005	14.06	NA	9	682	350	LOG W=3.072 LOG L-5.147
2006	7.91	NA	5	437	340	LOG W=2.854 LOG L-4.585
2007	8.71	NA	5	443	340	LOG W=2.829 LOG L-4.526
2008	4.45	NA	3	233	390	LOG W=3.209 LOG L-5.530
2009	2.61	NA	1	122	380	LOG W=2.915 LOG L-4.717
2010	2.97	NA	2	102	410	LOG W=3.057 LOG L-5.109
2011	1.00	NA	1	47	400	LOG W=2.792 LOG L-4.408

Table 4. Fisheries summary for Freshwater drum 1977-2011.

YEAR	ELECTRO CPUE Fish/hr	TRAPNET CPUE Fish/hr	CATCH COMP (%)	N	MEAN LENGTH	LENGTH WEIGHT REGRESSION
1977	7.49	5.27	13	569	NA	LOG W=2.947 LOG L-4.756
1978	11.97	6.28	17	422	NA	LOG W=2.911 LOG L-4.710
1979	7.47	5.22	21	360	NA	LOG W=3.068 LOG L-5.100
1980	5.89	3.83	18	520	NA	LOG W=3.052 LOG L-5.026
1981	30.88	4.76	12	1146	267	LOG W=2.891 LOG L-4.625
1982	9.30	11.00	24	2225	293	LOG W=2.888 LOG L-4.625
1983	8.80	8.18	22	1626	287	LOG W=3.001 LOG L-4.927
1984	7.07	6.21	20	1212	288	LOG W=2.598 LOG L-3.919
1985	10.15	7.92	31	1712	293	LOG W=2.846 LOG L-4.452
1986	8.33	0.39	22	856	310	LOG W=3.089 LOG L-5.139
1987	10.29	3.75	16	940	312	LOG W=2.874 LOG L-4.603
1988	9.85	NA	8	419	280	LOG W=2.722 LOG L-4.205
1989	13.17	NA	11	570	294	LOG W=2.908 LOG L-4.707
1990	17.70	NA	13	724	297	LOG W=3.008 LOG L-4.957
1991	15.68	NA	12	596	305	LOG W=2.955 LOG L-4.824
1992	14.23	NA	11	539	320	LOG W=2.967 LOG L-4.829
1993	20.83	NA	18	584	334	LOG W=3.063 LOG L-5.053
1994	15.92	NA	14	495	332	LOG W=3.072 LOG L-5.086
1995	14.96	NA	12	605	317	LOG W=3.124 LOG L-5.243
1996	9.33	NA	8	374	300	LOG W=3.061 LOG L-5.093
1997	18.18	NA	10	812	300	LOG W=3.090 LOG L-5.159
1998	23.47	NA	11	983	320	LOG W=3.171 LOG L-5.344
1999	45.53	NA	17	1745	320	LOG W=3.138 LOG L-5.289
2000	19.88	NA	8	776	310	LOG W=3.077 LOG L-5.161
2001	28.17	NA	15	1279	330	LOG W=3.212 LOG L-5.480
2002	24.45	NA	12	1062	320	LOG W=3.155 LOG L-5.346
2003	37.51	NA	19	1595	350	LOG W=3.276 LOG L-5.637
2004	21.12	NA	12	928	310	LOG W=3.080 LOG L-5.131
2005	32.02	NA	22	1342	330	LOG W=3.129 LOG L-5.238
2006	16.61	NA	11	873	320	LOG W=3.258 LOG L-5.546
2007	22.52	NA	12	1006	320	LOG W=3.054 LOG L-5.053
2008	28.57	NA	18	1293	350	LOG W=3.247 LOG L-5.531
2009	34.25	NA	18	1621	330	LOG W=3.144 LOG L-5.266
2010	28.97	NA	20	1202	340	LOG W=3.299 LOG L-5.673
2011	32.03	NA	24	1459	340	LOG W=3.194 LOG L-5.389

Table 5. Fisheries summary for Shorthead redhorse 1977-2011.

YEAR	ELECTRO CPUE Fish/hr	TRAPNET CPUE Fish/hr	CATCH COMP (%)	N	MEAN LENGTH	LENGTH WEIGHT REGRESSION
1977	5.39	1.58	5	259	NA	LOG W=2.902 LOG L-4.691
1978	2.96	1.09	4	125	NA	LOG W=2.978 LOG L-4.917
1979	2.08	0.45	3	67	NA	LOG W=3.041 LOG L-5.090
1980	6.08	0.70	7	137	NA	LOG W=2.894 LOG L-4.678
1981	11.67	1.34	7	686	376	LOG W=2.791 LOG L-4.428
1982	13.56	0.92	7	675	392	LOG W=2.814 LOG L-4.496
1983	8.96	0.79	6	454	387	LOG W=2.849 LOG L-4.590
1984	9.74	0.51	7	435	386	LOG W=2.571 LOG L-3.840
1985	7.36	0.51	7	374	389	LOG W=2.787 LOG L-4.415
1986	7.07	0.19	8	319	398	LOG W=2.911 LOG L-4.730
1987	13.80	1.24	12	722	403	LOG W=2.860 LOG L-4.608
1988	17.48	NA	13	667	381	LOG W=2.696 LOG L-4.176
1989	24.52	NA	17	902	370	LOG W=2.792 LOG L-4.448
1990	22.60	NA	14	838	361	LOG W=2.825 LOG L-4.544
1991	13.58	NA	11	538	355	LOG W=2.784 LOG L-4.443
1992	19.35	NA	14	721	403	LOG W=2.841 LOG L-4.587
1993	10.86	NA	10	332	382	LOG W=3.011 LOG L-4.991
1994	13.51	NA	14	505	389	LOG W=2.872 LOG L-4.655
1995	9.67	NA	8	450	364	LOG W=2.925 LOG L-4.808
1996	13.42	NA	11	551	380	LOG W=2.897 LOG L-4.719
1997	19.21	NA	10	833	350	LOG W=2.982 LOG L-4.960
1998	23.94	NA	12	1047	360	LOG W=2.982 LOG L-4.960
1999	21.17	NA	9	931	350	LOG W=3.016 LOG L-5.050
2000	25.94	NA	11	1099	360	LOG W=2.905 LOG L-4.760
2001	17.43	NA	9	777	370	LOG W=3.039 LOG L-5.101
2002	17.23	NA	9	781	370	LOG W=2.954 LOG L-4.892
2003	20.92	NA	11	878	390	LOG W=3.033 LOG L-5.071
2004	25.63	NA	15	1141	360	LOG W=2.948 LOG L-4.855
2005	12.85	NA	9	562	350	LOG W=2.833 LOG L-4.544
2006	14.38	NA	10	731	370	LOG W=2.772 LOG L-4.375
2007	20.11	NA	11	889	330	LOG W=2.808 LOG L-4.481
2008	17.72	NA	11	782	350	LOG W=2.886 LOG L-4.682
2009	32.47	NA	17	1398	350	LOG W=2.866 LOG L-4.625
2010	19.11	NA	13	908	350	LOG W=2.886 LOG L-4.672
2011	18.65	NA	14	907	370	LOG W=2.935 LOG L-4.779

Table 6. Fisheries summary for White bass 1977-2011.

YEAR	ELECTRO CPUE Fish/hr	TRAPNET CPUE Fish/hr	CATCH COMP (%)	N	MEAN LENGTH	LENGTH WEIGHT REGRESSION
1977	7.76	6.73	19	565	NA	LOG W=2.441 LOG L-3.529
1978	7.11	5.67	17	369	NA	LOG W=2.956 LOG L-4.813
1979	3.49	3.02	13	217	NA	LOG W=3.055 LOG L-5.057
1980	2.48	1.97	9	183	NA	LOG W=3.064 LOG L-5.022
1981	30.88	5.39	20	1996	240	LOG W=2.842 LOG L-4.498
1982	28.11	0.07	18	1722	286	LOG W=2.909 LOG L-4.677
1983	17.50	4.52	17	1277	300	LOG W=3.041 LOG L-5.021
1984	13.53	2.89	15	435	304	LOG W=2.571 LOG L-3.840
1985	16.75	1.39	14	768	308	LOG W=2.773 LOG L-4.337
1986	14.23	1.63	18	732	325	LOG W=2.926 LOG L-4.716
1987	9.70	1.44	10	589	321	LOG W=3.027 LOG L-4.958
1988	22.90	NA	20	1009	242	LOG W=2.855 LOG L-4.525
1989	20.00	NA	15	819	266	LOG W=2.945 LOG L-4.765
1990	25.49	NA	16	941	295	LOG W=2.913 LOG L-4.697
1991	24.15	NA	18	886	310	LOG W=2.911 LOG L-4.696
1992	17.36	NA	11	577	338	LOG W=2.967 LOG L-4.829
1993	14.42	NA	12	390	328	LOG W=2.939 LOG L-4.750
1994	10.20	NA	10	360	339	LOG W=2.911 LOG L-4.671
1995	20.16	NA	16	809	267	LOG W=3.026 LOG L-4.975
1996	16.99	NA	14	660	320	LOG W=3.066 LOG L-5.068
1997	28.53	NA	15	1159	300	LOG W=3.054 LOG L-5.038
1998	32.90	NA	16	1314	320	LOG W=3.085 LOG L-5.106
1999	35.91	NA	14	1461	300	LOG W=3.011 LOG L-4.942
2000	39.90	NA	16	1602	320	LOG W=2.963 LOG L-4.830
2001	32.37	NA	17	1436	320	LOG W=2.967 LOG L-4.821
2002	41.69	NA	21	1656	320	LOG W=3.042 LOG L-5.013
2003	31.22	NA	16	1272	330	LOG W=2.977 LOG L-4.829
2004	24.29	NA	14	1011	310	LOG W=3.029 LOG L-4.960
2005	24.21	NA	16	982	330	LOG W=2.947 LOG L-4.742
2006	16.71	NA	12	845	330	LOG W=2.886 LOG L-4.594
2007	22.68	NA	13	953	330	LOG W=2.902 LOG L-4.630
2008	18.83	NA	12	839	330	LOG W=2.850 LOG L-4.514
2009	24.42	NA	13	1085	330	LOG W=2.962 LOG L-4.784
2010	26.25	NA	19	1118	340	LOG W=2.882 LOG L-4.593
2011	21.26	NA	16	915	340	LOG W=2.765 LOG L-4.302

Table 7. Fisheries summary for Walleye 1977-2011.

YEAR	ELECTRO CPUE Fish/hr	TRAPNET CPUE Fish/hr	CATCH COMP (%)	N	MEAN LENGTH	LENGTH WEIGHT REGRESSION
1977	1.36	0.37	1	20	NA	LOG W=3.137 LOG L-5.377
1978	1.54	0.96	2	28	NA	LOG W=3.056 LOG L-5.197
1979	1.57	0.31	2	34	NA	LOG W=3.225 LOG L-5.640
1980	1.20	0.13	1	22	NA	LOG W=3.250 LOG L-5.693
1981	3.53	0.39	2	189	335	LOG W=3.082 LOG L-5.240
1982	2.96	0.16	1	135	415	LOG W=3.097 LOG L-5.293
1983	1.63	0.21	1	90	432	LOG W=3.095 LOG L-5.295
1984	2.04	0.11	2	93	378	LOG W=2.852 LOG L-4.615
1985	2.64	0.13	2	119	413	LOG W=3.159 LOG L-5.461
1986	1.99	0.15	2	101	404	LOG W=3.085 LOG L-5.269
1987	3.00	0.09	2	132	386	LOG W=3.151 LOG L-5.446
1988	5.80	NA	5	234	450	LOG W=3.103 LOG L-5.272
1989	4.19	NA	3	173	408	LOG W=3.140 LOG L-5.379
1990	2.36	NA	2	95	420	LOG W=3.214 LOG L-5.594
1991	1.44	NA	1	52	477	LOG W=3.318 LOG L-5.870
1992	2.30	NA	1	82	403	LOG W=3.257 LOG L-5.727
1993	2.00	NA	2	60	465	LOG W=3.001 LOG L-5.020
1994	2.11	NA	2	74	439	LOG W=3.261 LOG L-5.720
1995	2.63	NA	2	107	333	LOG W=3.208 LOG L-5.586
1996	2.75	NA	2	118	360	LOG W=3.159 LOG L-5.467
1997	5.63	NA	3	248	400	LOG W=3.215 LOG L-5.617
1998	6.16	NA	3	272	420	LOG W=3.148 LOG L-5.440
1999	7.63	NA	3	308	440	LOG W=3.238 LOG L-5.690
2000	7.72	NA	3	325	460	LOG W=3.250 LOG L-5.717
2001	8.93	NA	5	399	400	LOG W=3.296 LOG L-5.837
2002	9.75	NA	5	415	390	LOG W=3.257 LOG L-5.744
2003	7.18	NA	4	304	450	LOG W=3.253 LOG L-5.726
2004	5.02	NA	3	232	440	LOG W=3.175 LOG L-5.494
2005	2.11	NA	1	86	510	LOG W=3.225 LOG L-5.633
2006	2.77	NA	2	147	510	LOG W=3.352 LOG L-5.964
2007	3.76	NA	2	184	440	LOG W=3.200 LOG L-5.559
2008	3.28	NA	2	144	490	LOG W=3.105 LOG L-5.314
2009	5.11	NA	3	238	440	LOG W=3.173 LOG L-5.496
2010	3.47	NA	2	165	470	LOG W=3.300 LOG L-5.821
2011	4.29	NA	3	196	440	LOG W=3.084 LOG L-5.256

Table 8. Fisheries summary for Sauger 1977-2011.

YEAR	ELECTRO CPUE Fish/hr	TRAPNET CPUE Fish/hr	CATCH COMP (%)	N	MEAN LENGTH	LENGTH WEIGHT REGRESSION
1977	0.77	0.40	1	20	NA	LOG W=2.984 LOG L-4.991
1978	2.43	0.38	2	38	NA	LOG W=3.100 LOG L-5.354
1979	1.57	0.30	2	24	NA	LOG W=3.009 LOG L-5.158
1980	1.79	0.17	2	16	NA	LOG W=3.169 LOG L-5.509
1981	7.28	0.29	4	NA	NA	NA
1982	7.50	0.17	4	329	256	LOG W=2.864 LOG L-4.773
1983	3.80	0.25	3	188	285	LOG W=3.013 LOG L-5.144
1984	4.07	0.19	3	182	262	LOG W=2.648 LOG L-4.202
1985	4.57	0.21	4	199	283	LOG W=2.996 LOG L-5.019
1986	3.29	0.24	4	178	294	LOG W=3.336 LOG L-5.936
1987	4.94	0.12	2	114	262	LOG W=3.177 LOG L-5.556
1988	2.10	NA	2	79	236	LOG W=2.683 LOG L-4.285
1989	2.70	NA	2	104	237	LOG W=3.208 LOG L-5.639
1990	2.29	NA	2	92	291	LOG W=3.070 LOG L-5.277
1991	3.07	NA	2	117	308	LOG W=3.155 LOG L-5.507
1992	5.24	NA	4	196	297	LOG W=3.029 LOG L-5.191
1993	5.71	NA	5	168	262	LOG W=2.950 LOG L-4.976
1994	4.16	NA	4	145	280	LOG W=3.153 LOG L-5.484
1995	5.80	NA	5	233	243	LOG W=3.090 LOG L-5.369
1996	5.41	NA	5	228	270	LOG W=3.142 LOG L-5.475
1997	9.99	NA	5	437	270	LOG W=3.065 LOG L-5.294
1998	9.57	NA	5	386	250	LOG W=3.190 LOG L-5.596
1999	18.26	NA	7	756	260	LOG W=3.262 LOG L-5.788
2000	9.81	NA	4	435	280	LOG W=3.306 LOG L-5.892
2001	6.47	NA	3	308	310	LOG W=3.356 LOG L-6.015
2002	7.50	NA	4	329	280	LOG W=3.350 LOG L-6.018
2003	5.86	NA	3	247	300	LOG W=3.281 LOG L-5.842
2004	7.75	NA	4	333	270	LOG W=3.232 LOG L-5.678
2005	5.20	NA	3	233	290	LOG W=3.163 LOG L-5.505
2006	2.98	NA	2	163	280	LOG W=3.042 LOG L-5.203
2007	5.38	NA	3	228	250	LOG W=3.283 LOG L-5.794
2008	7.84	NA	5	320	250	LOG W=3.194 LOG L-5.577
2009	6.13	NA	3	265	260	LOG W=2.973 LOG L-5.025
2010	5.83	NA	4	263	290	LOG W=2.870 LOG L-4.767
2011	7.33	NA	5	330	300	LOG W=3.077 LOG L-5.299

Table 9. Smallmouth and largemouth bass electrofishing CPUE (fish/hr) and rank, 1981-2011.

	Smallmouth Bass		Largemouth Bass	
Year	CPUE	Rank	CPUE	Rank
1981	4.65	9	0.58	20
1982	3.72	7	0.41	18
1983	2.17	8	0.80	11
1984	2.19	7	1.16	11
1985	1.56	8	0.54	15
1986	0.85	9	0.21	20
1987	2.94	7	0.61	16
1988	5.72	7	4.06	9
1989	13.52	4	3.40	10
1990	16.44	5	2.39	9
1991	11.03	5	1.87	11
1992	9.61	5	2.50	11
1993	5.80	6	1.10	14
1994	3.83	7	0.65	15
1995	5.81	5	1.93	12
1996	7.31	5	2.08	10
1997	13.23	5	2.10	15
1998	15.01	5	2.75	14
1999	13.51	7	3.71	13
2000	17.02	6	4.67	11
2001	13.01	5	5.21	11
2002	15.91	5	6.14	11
2003	15.59	5	5.09	11
2004	16.15	6	4.73	10
2005	9.77	6	1.22	17
2006	13.39	5	8.57	7
2007	23.02	2	7.02	8
2008	18.16	4	6.33	8
2009	18.44	5	6.14	8
2010	10.50	5	1.64	15
2011	8.15	5	2.78	11

Table 10. Species composition expressed as % of total annual catches for PINGP fisheries studies, electrofishing and trapnetting combined for 1981-1987, and electrofishing only for 1988-2011.

Year	Carp	White bass	Freshwater Drum	Sauger	Black Crappie	Shorthead Redhorse	Walleye	Gizzard Shad	Total %
1981	17	20	12	4	15	7	2	9	86
1982	23	18	24	4	9	7	1	3	89
1983	18	17	22	3	16	6	1	2	85
1984	26	15	20	3	12	7	2	1	86
1985	20	14	31	4	9	7	2	1	87
1986	21	18	22	4	9	8	2	<1	84
1987	27	10	16	2	11	12	2	1	81
1988*	23	20	8	2	3	13	5	3	77
1989*	20	15	11	2	1	17	3	<1	70
1990*	20	16	13	1	<1	14	1	3	69
1991*	24	18	12	2	1	11	1	4	73
1992*	26	12	11	4	1	14	2	2	72
1993*	28	12	18	5	<1	10	2	2	76
1994*	34	10	14	4	<1	14	2	<1	78
1995*	30	16	12	5	1	8	2	4	78
1996*	34	14	8	5	2	11	2	<1	76
1997*	29	15	10	5	1	10	3	<1	73
1998*	23	16	11	5	2	12	3	2	74
1999*	17	14	17	7	3	9	3	12	82
2000*	16	16	8	4	2	11	3	17	77
2001*	15	17	15	3	2	9	5	6	72
2002*	14	21	12	4	2	9	5	7	74
2003*	13	16	19	3	1	11	4	5	72
2004*	14	14	12	4	1	15	3	10	73
2005*	14	16	22	3	<1	9	1	9	74
2006*	16	12	11	2	3	10	2	5	61
2007*	13	13	12	3	3	11	2	5	62
2008*	14	12	18	5	1	11	2	3	66
2009*	11	13	18	3	1	17	3	1	67
2010*	9	19	20	4	1	13	2	2	70
2011*	9	16	24	5	1	14	3	1	73

*Electrofishing only