

**SUMMARY REPORT:
MISSISSIPPI RIVER CHANNEL CATFISH SAMPLING, POOL 8, 2007, 2008.**

David Heath, Kenneth Von Ruden and Jacob Schweitzer
Wisconsin Department of Natural Resources,
Mississippi River Fisheries Team, La Crosse, WI.

28 July 2009

Purpose

The purpose of this work is to continue monitoring channel catfish populations in Navigation Pool 8 of the Mississippi River.

Methods

Collection methods used were identical to those used by Schellhaass and Holzer (1989) with four exceptions. During 2007 and 2008, we did not age any fish, no fish were marked, commercial nets were not set and data was not taken at fish markets. Locations of netting stations are given in Figure 1 and were identical to locations used in two previous studies including Endris (1999).

We sampled fish using combination gear of hoop net and slat trap baited with soy cake on August 13, 15, 17, 20, 2007 and August 8, 11, 13, 15, 18, 2008. SAS[®] Version 9.1 was used for data analysis.

Findings

The mean daily ambient water temperatures during 2007 sampling was 24.4°C and generally declined over the six days of sampling (Table 1). During sampling, the water surface elevation measured at the La Crosse, Wisconsin gage changed as much as 3.86 feet. The mean daily flow in cubic feet per second was 26717 and fluctuated as much as 10817 cubic feet per second. A sudden rise in elevations and flows the last day of sampling due to a very heavy local rain event terminated sampling.

The mean daily ambient water temperatures during 2008 sampling was 24.7°C and generally remained stable over the eight days of sampling (Table 1). During sampling, the water surface elevation measured at the La Crosse, Wisconsin gage changed as much as 0.27 feet. The mean daily flow in cubic feet per second was 14475 and fluctuated as much as 1900 cubic feet per second.

Catch per Effort, combined Gears

During 2007, a total of 343 channel catfish were caught in combined gear of hoop nets and slat traps and comprised 55.68 percent of the total (Table 2). The mean channel catfish catch / net day was 6.25 (standard deviation = 7.38, n = 23) during 52.58 net days of fishing and varied from a minimum of 0 to a maximum of 27.45.

During 2008, a total of 606 channel catfish were caught in combined gear of hoop nets and slat traps and comprised 83.24 percent of the total (Table 3). The mean channel catfish catch / net day was 9.23 (standard deviation = 11.85, n = 27) during 67.176 net days of fishing and

varied from a minimum of 0 to a maximum of 39.80. The 2008 channel catfish catch rate was not significantly different from the 2007 catch rate.

These data were similar to results of 1982 to 1986 sampling conducted in Pool 8. The mean channel catfish catch / net day varied from 4.2 to 7.8 during the 1980's. This compares to a combined catch of 7.86 fish / net day (standard deviation = 10.06, n = 50) during 2007 and 2008.

In addition to comparing recent catch rates to work done in the 1980's, we compared channel catfish catch rates to netting done from 1993–1997 for combined gears in Pool 8. Catch rates from 2007 and 2008 (7.85 fish / net day, n = 50) were the same as 1993, 1996 and 1997 (9.35 fish / net day, n = 215) but were significantly less than 1994 and 1995 (20.36 fish / net day, n = 144) (Table 4).

Channel catfish catch rates were also compared among pools sampled in 2007 and 2008. Pool 8 catch rates were different only from Pool 4 (1.94 fish / net day, standard deviation = 19.5, n = 18) and were the same as Pool 10. Interestingly, Pool 10 catch rates differed between years. During 2007, 12.75 channel catfish were caught per net day (standard deviation = 14.73, n = 23) while the rate was 2.58 (standard deviation = 3.98, n = 48) during 2008. This difference could be due to high flows in 2007 (36230 vs. 14683 cubic feet per second) although there was a similar difference in flows in Pool 8 where we saw no difference in catch rates between years. Pool 10 water surface temperatures taken at netting stations were different between 2007 and 2008. During 2007, the mean temperature was 24.6°C and during 2008 it was 23.6°C. Pool 8 mean temperatures varied by 0.3°C among years.

Length Distributions

The 2007 Pool 8 channel catfish mean size was 11.72 inches (n=343). A total of 79.01% were smaller than the commercial size limit of 15 inches (Figure 2). In 2008, the mean size was 11.48 inches (n=606). A total of 85.97% were smaller than the commercial size limit of 15 inches (Figure 3). There was no significant difference between the 2007 and 2008 mean lengths (p=0.36).

These data were similar to results of 1982 to 1986 sampling conducted in Pool 8. During the 1980's, a total of 10,347 channel catfish were caught. The mean size was 12.3 inches, and was 0.7 inches greater than the combined mean length for 2007–2008 (11.57 inches). A total of 84% of the 1980's channel catfish were less than 15 inches in total length which is virtually identical to 83.46% of fish found less than 15 inches during 2007 and 2008, combined.

We compared Pool 8 mean lengths among years from 1993–2008. Mean annual lengths from each of 2007–2008 (about 11.57 inches) were significantly smaller than all mean annual lengths from each of 1993–1997 (about 12.94 inches) (Table 6 and Figure 4). The magnitude of this difference varied from 0.84 to 3.18 inches.

We also compared mean lengths among Pools 8, 10 and 4. Pools 8 and 10 were sampled in 2007 and 2008; Pool 4 was sampled in 2007 only. Mean lengths were significantly different (p<0.001) among all three pools. Pool 4 had the largest channel catfish (mean=15.58 inches, standard deviation=4.58, n=70) followed by Pool 8 (mean=11.57 inches, standard deviation=3.83, n=949) and Pool 10 (mean=9.76 inches, standard deviation= 2.47, n= 972).

Commercial Harvest

To further investigate the recent reduction in mean annual size, we examined the Pool 8 channel catfish harvest reported by licensed commercial fishers. For the years 1953 through 1991, the catfish catch was not separated by species. Therefore, we have only combined reporting data for these years. From 1992 through 2008, the reported catch was separated by

species. The 1992 through 2008 Pool 8 harvest of channel catfish from Minnesota licensed fishers was not used. It never comprised more than 4 percent of the total catch in any year.

The annual harvest of channel catfish and flathead catfish combined from Pool 8 increased an average of about 2455 pounds per year from 1953 through 1976. From 1977 through 2007, the combined catfish catch declined an average of 2484 pounds per year. Assuming flathead catfish comprised 16% of the combined catfish harvest (calculated from 1992-2008 data), it's likely that Pool 8 channel catfish harvest declined from 1977 through 2007.

From 1992 through 2008, the reported commercial catch of channel catfish from Wisconsin licensed fishers clearly declined. During the early 1990's, the catch was about 50,000 pounds per year (Figure 5). It declined an average of 3,457 pounds per year. During 2008 it was 5,389 pounds. Considering the decline in Pool 8 commercial harvest of channel catfish, increased commercial harvest of larger individuals does not seem to explain the recent reduction in mean size.

Conclusions

Pool 8 channel catfish catch rates from 2007 and 2008 were similar to those from the 1980's and 1990's. They were close to the range of 1980's values, and differed from two of the five annual catch rates from the 1990's.

Mean size of 2007–2008 Pool 8 channel catfish was 0.7 inches smaller than ones collected during the 1980's although the proportion less than 15 inches was virtually identical among time spans.

Pool 8 mean annual lengths from the 1990's were significantly larger (about 1.4 inches) than those from 2007 and 2008. None of the mean annual lengths from the 1990's had values smaller than those seen during either 2007 or 2008. Some reasons for smaller recent fish could include a relatively large young age class during 2007–2008. Relatively higher exploitation of larger fish did not occur and therefore, does not explain the reduction in mean size. Pool 8 sampling should continue to determine if the observation of recent smaller channel catfish continues.

Presently, Wisconsin's Pool 8 commercial channel catfish regulations allow only gill nets, setlines and seines; all other commercial gear is not allowed (Wisconsin Administrative Code, Chapter NR 21). Dead set gill nets can be used on specified parts of pool 8 year round. Seines can be used in specified parts of Pool 8 much of the year although a commercial fisher and his or her crew members may not remove more than 100 pounds of catfish per seine haul or take more than 100 pounds of catfish per day from the Saturday nearest October 1 to April 30. Setlines, with up to 400 hooks, can be used from the Saturday nearest April 1 to October 31 in most of Pool 8. The size limit on channel catfish is 15 inches long or longer or, 12 inches long or longer dressed.

Along with the commercial fishery, sport fishing for catfish is regulated as well in Pool 8. The season is open continuously with a daily catfish (channel catfish and flathead catfish) bag limit of 25 fish in aggregate. There is no size limit. These commercial fishing and sport fishing regulations have been in effect since the early 1980's.

Recommendations

1. Continue to monitor channel catfish catch rates and total lengths from Pool 8 to determine if differences from the 1990's continue into the future.
2. Initiate monitoring of Pool 9 channel catfish for comparison with data from the 1980's and 1990's.

3. Because of the low cost and time commitment of annual sampling, monitoring should continue.

REFERENCES

Endris, Mark B. 1999. Channel Catfish Population Assessment Comparing Mississippi River Pool 8 and 9 with Differing Commercial Fishing Regulations. Wi. DNR, La Crosse, WI. 32 pp. DRAFT.

Schellhaass, S. and J. Holzer. 1989. Monitor changes in the size structure of channel catfish populations in Pool 9 resulting from implementation of a 15-inch commercial size limit. Wisc. Dept. Nat. Res. Miss. R. Work Unit Fish. Summ. Rpts.-1989: 130-148.

FIGURE 1. SUMMER 2007, 2008 CHANNEL CATFISH SAMPLING STATION LOCATIONS. (2008 NAIP PHOTO).

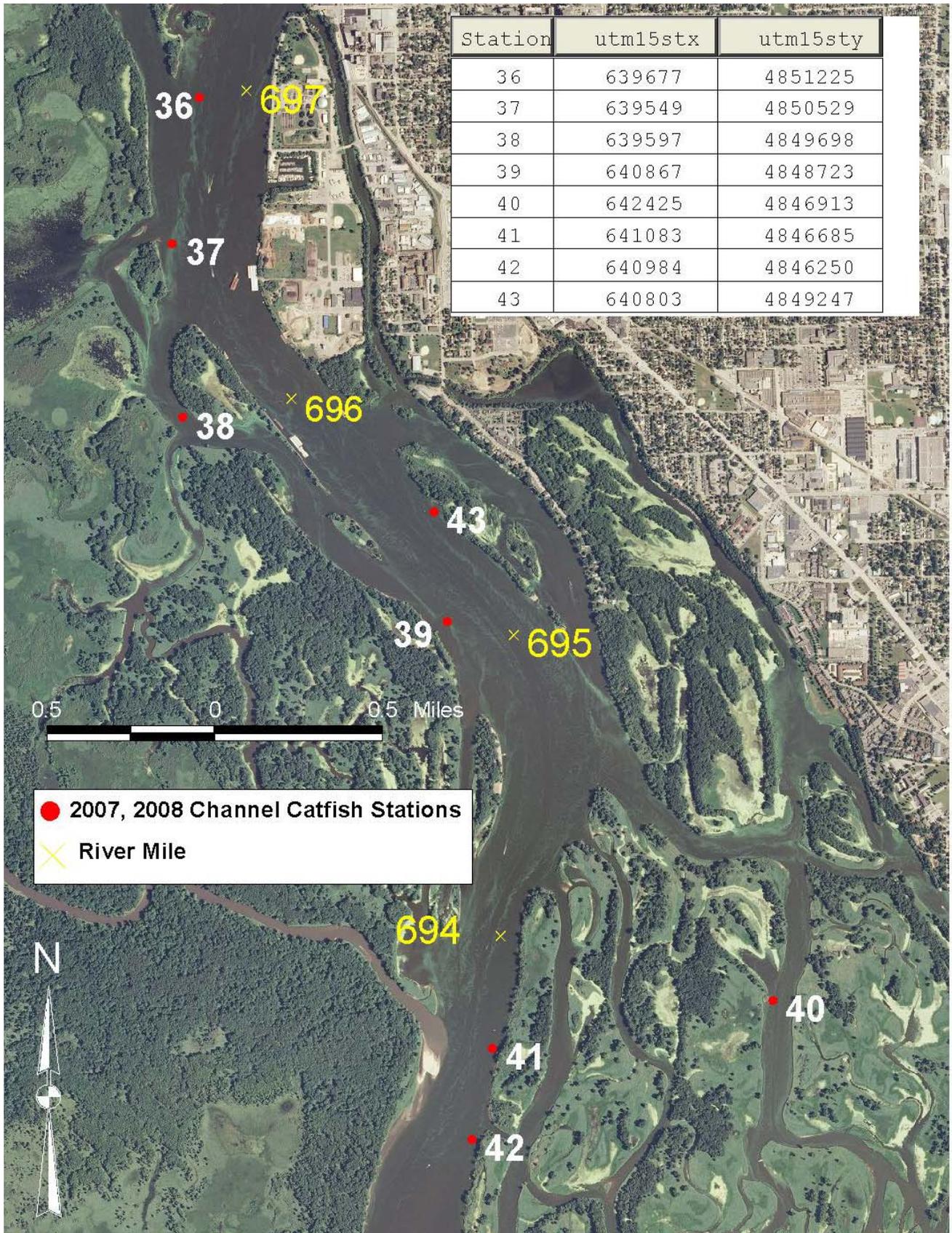


TABLE 1. MEAN TEMPERATURE, WATER SURFACE ELEVATION AND FLOW DURING SUMMER 2007, 2008 CHANNEL CATFISH SAMPLING.

DATE	MEAN DAILY TEMPERA- TURE °C	WATER SURFACE ELEVATION (ft), LA CROSSE	FLOW (cfs) DAM 8
08/15/2007	26.6	631.48	15900
08/17/2007	25.5	631.18	17600
08/20/2007	20.5	635.04	49500
2007 MEAN	24.4	632.46	26717
08/11/2008	24.8	630.94	13600
08/13/2008	24.5	631.17	13500
08/15/2008	24.4	631.20	15400
08/18/2008	25.0	631.21	15400
2008 MEAN	24.7	631.13	14475

TABLE 2. RELATIVE ABUNDANCE, MEAN CATCH PER NET-DAY, COMBINED GEARS, AUGUST 2007.

	SPECIES	FREQUENCY	PERCENT	MEAN	STANDARD DEV.	MIN.	MAX.	NET-DAYS
1	black crappie	20	3.25	0.42	1.18	0.00	5.56	52.579
2	bluegill	225	36.53	4.68	5.39	0.00	18.69	52.579
3	channel catfish	343	55.68	6.25	7.38	0.00	27.45	52.579
4	common carp	3	0.49	0.06	0.22	0.00	1.02	52.579
5	flathead catfish	1	0.16	0.02	0.11	0.00	0.51	52.579
6	freshwater drum	3	0.49	0.05	0.17	0.00	0.66	52.579
7	gizzard shad	2	0.32	0.03	0.14	0.00	0.66	52.579
8	longnose gar	1	0.16	0.02	0.11	0.00	0.51	52.579
9	silver redhorse	1	0.16	0.01	0.07	0.00	0.33	52.579
10	smallmouth bass	1	0.16	0.02	0.11	0.00	0.51	52.579
11	white bass	1	0.16	0.02	0.10	0.00	0.50	52.579
12	yellow perch	15	2.44	0.33	0.96	0.00	3.55	52.579
	ALL SPECIES	616	100.00	11.93	8.62	0.00	28.47	52.579

TABLE 3. RELATIVE ABUNDANCE, MEAN CATCH PER NET-DAY, COMBINED GEARS, AUGUST 2008.

	SPECIES	FREQUENCY	PERCENT	MEAN	STANDARD DEV.	MIN.	MAX.	NET-DAYS
1	black crappie	12	1.65	0.19	0.52	0.00	1.98	67.176
2	bluegill	73	10.03	1.16	1.42	0.00	5.92	67.176
3	channel catfish	606	83.24	9.23	11.85	0.00	39.80	67.176
4	common carp	1	0.14	0.01	0.07	0.00	0.35	67.176
5	flathead catfish	3	0.41	0.05	0.14	0.00	0.50	67.176
6	freshwater drum	26	3.57	0.37	0.54	0.00	1.63	67.176
7	rock bass	1	0.14	0.01	0.07	0.00	0.35	67.176
8	shorthead redhorse	1	0.14	0.01	0.07	0.00	0.35	67.176
9	smallmouth buffalo	4	0.55	0.06	0.21	0.00	0.98	67.176
10	yellow perch	1	0.14	0.02	0.09	0.00	0.49	67.176
	ALL SPECIES	728	100.00	11.11	12.75	0.00	42.94	67.176

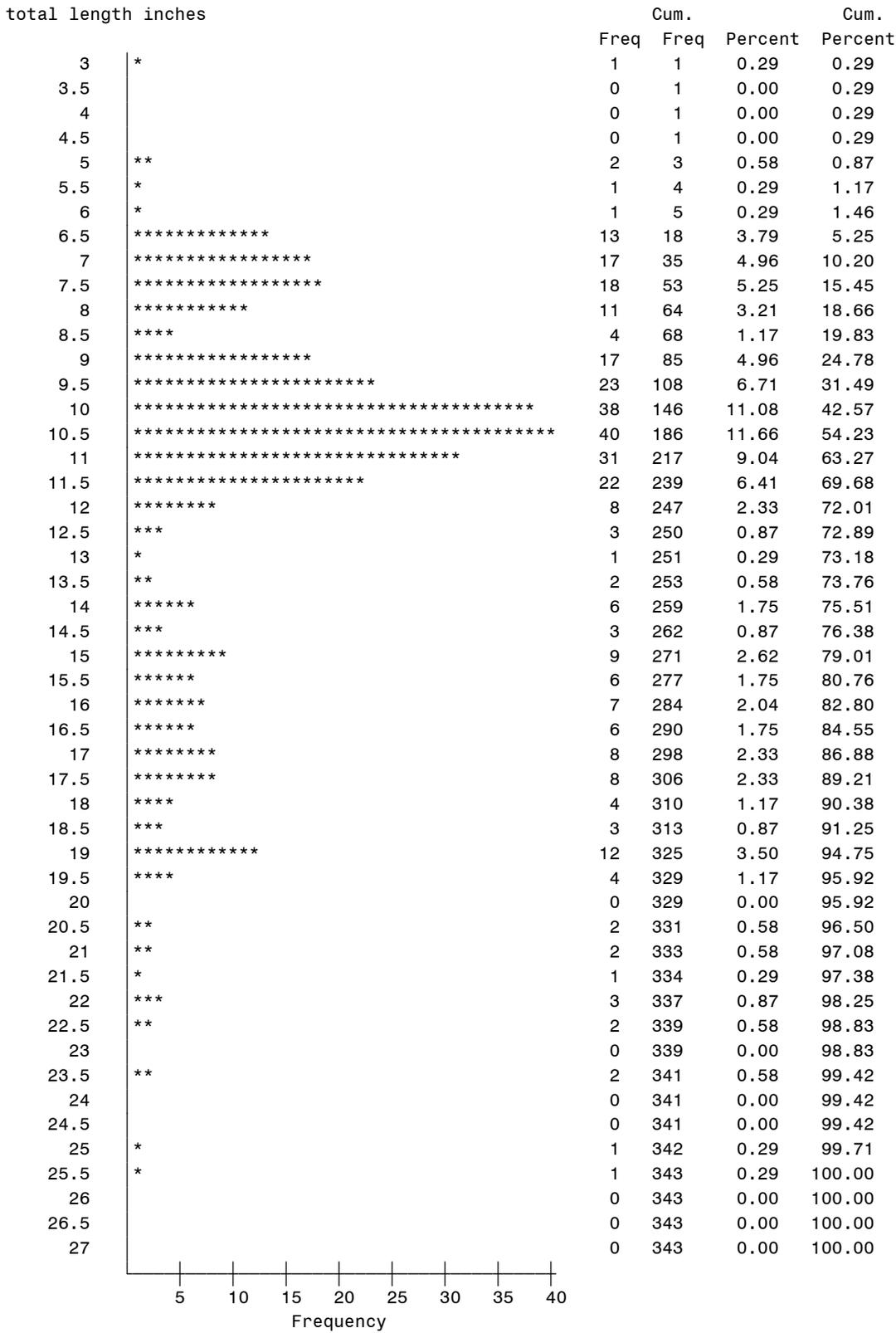
TABLE 4. COMPARISON OF MEAN POOL 8 CHANNEL CATFISH CATCH PER NET-DAY FOR COMBINED GEARS AMONG VARIOUS YEARS.

YEAR	STD. DEV.	N	MEAN	NET DAYS	DIFFERENT (means with the same letter are not Sign. Different)	
1994	19.75	73	22.87	208.00		A
1995	11.42	71	17.78	213.00	B	A
1993	13.63	72	12.23	208.00	B	C
2008	11.85	27	9.23	67.18		C
1996	6.93	72	8.02	208.00		C
1997	8.11	71	7.79	205.00		C
2007	7.38	23	6.25	52.58		C
ALL YEARS	13.76	409	13.05	1161.76		

TABLE 5. COMPARISON OF MEAN POOL 8 CHANNEL CATFISH CATCH PER NET-DAY FOR COMBINED GEARS AMONG POOLS AND YEARS

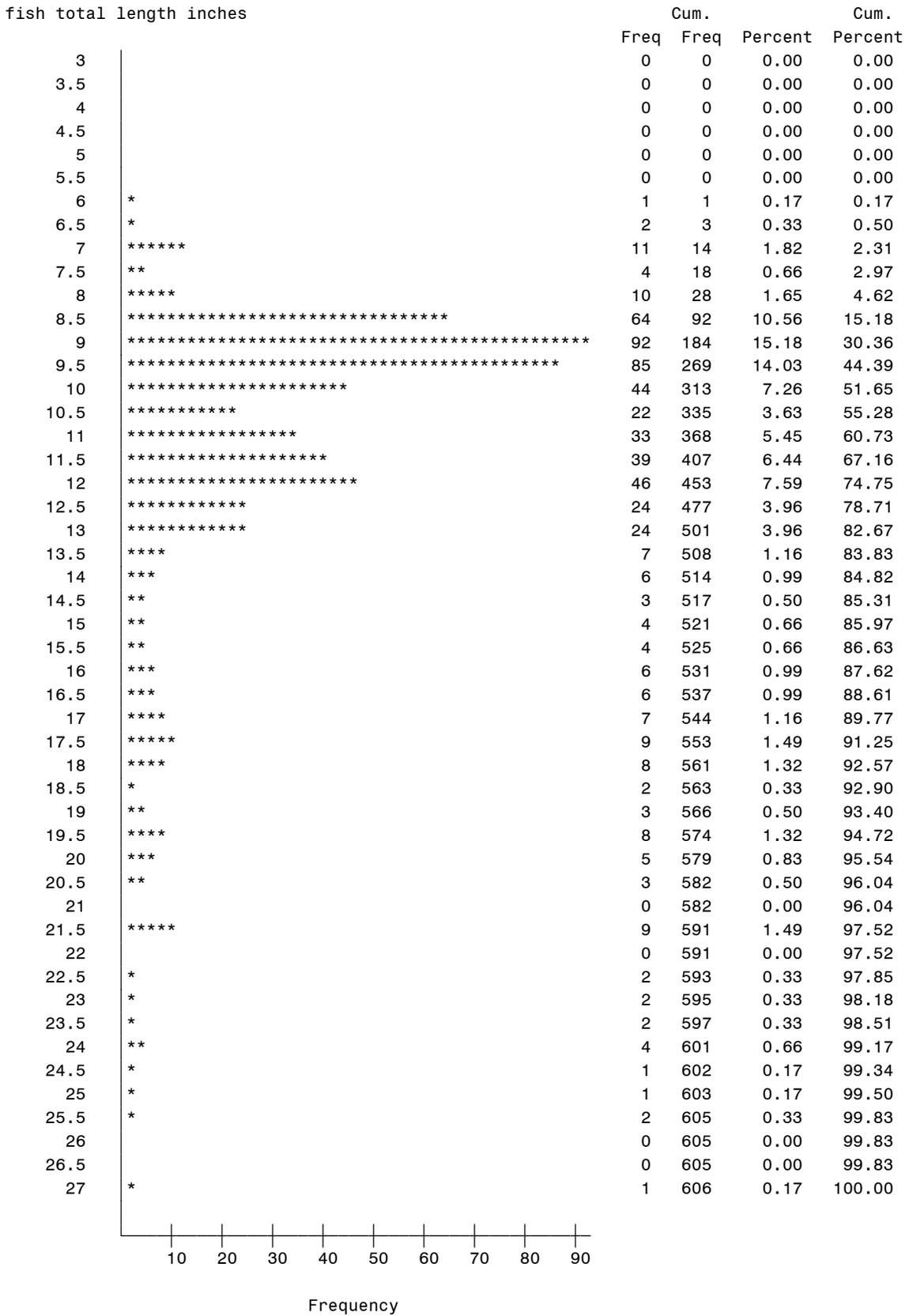
MEAN	STD. DEV.	N	POOL AND YEAR	DIFFERENT (means with the same letter are not Sign. Different)		
12.75	14.73	23	2007 POOL 10		A	
9.23	11.85	27	2008 POOL 8	B	A	
6.25	7.38	23	2007 POOL 8	B	A	C
2.58	3.98	48	2008 POOL 10	B		C
1.94	1.95	18	2007 POOL 4			C

FIGURE 2. CHANNEL CATFISH LENGTH DISTRIBUTION, MISSISSIPPI RIVER, POOL 8, 2007.



N	Mean	Std Dev	Minimum	Maximum
343	11.7203790	4.0800340	3.1000000	25.5000000

FIGURE 3. CHANNEL CATFISH LENGTH DISTRIBUTION, MISSISSIPPI RIVER, POOL 8, 2008.



N	Mean	Std Dev	Minimum	Maximum
606	11.4828614	3.6834563	6.1020000	26.7720000

TABLE 6. COMPARISON OF MEAN TOTAL LENGTH FOR POOL 8 CHANNEL CATFISH AMONG YEARS.

MEAN	STD. DEV.	N	YEAR	DIFFERENT (means with the same letter are not Sign. Different)		MIN.	MAX.
10.80		1592	1982			3.0	24.0
12.00		1836	1983			1.5	28.6
12.75		1928	1984			5.3	28.0
12.06		1758	1985			6.2	27.4
13.26		3233	1986			3.3	28.0
14.66	3.64	1585	1997	A		5.6	29.8
13.65	3.31	1657	1996	B		5.9	28.7
12.87	2.98	3780	1995	C		5.9	29.1
12.63	4.41	2509	1993	C	D	6.2	29.4
12.32	3.16	4628	1994		D	5.9	26.5
11.72	4.08	343	2007	E		3.1	25.5
11.48	3.68	606	2008	E		6.1	26.8
12.85	3.55	15108	1993-1997, 2007, 2008			3.1	29.8

FIGURE 4. ANNUAL MEAN LENGTH (INCHES) OF POOL 8 CHANNEL CATFISH, 1982-2008.

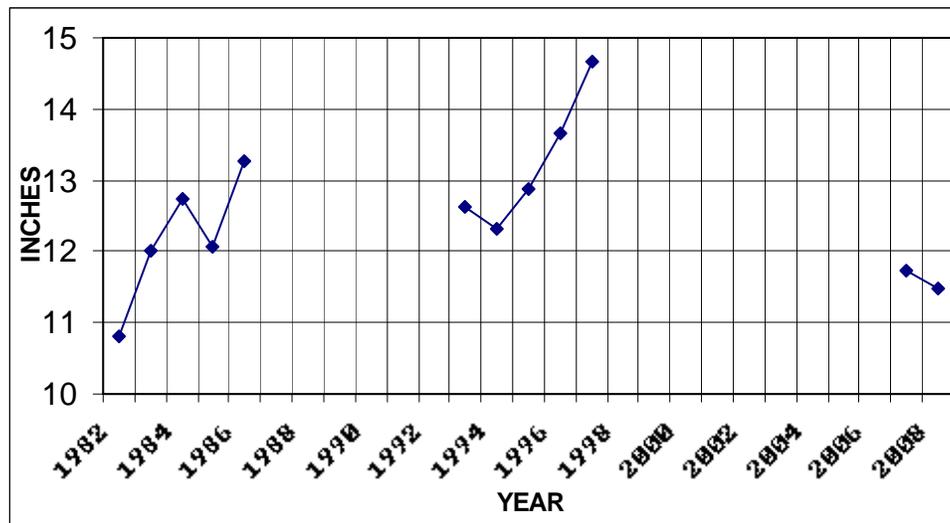


FIGURE 5.CHANNEL CATFISH HARVEST POOL 8, WISCONSIN LICENSED COMMERCIAL FISHERS, 1992-2008.

