47.3
33.4
33.5
33.8
1.1
1.2
42.4
42.6

SURVEY REPORT

OKLAHOMA FISHERIES MANAGEMENT PROGRAM

FISH MANAGEMENT SURVEYS AND RECOMMENDATIONS

FOR

Skiatook Lake

2004

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PERFORMANCE REPORT

State: Oklahoma Project No. F-44-D-19

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SKIATOOK LAKE

ABSTRACT

Skiatook Lake was sampled by spring night and day electrofishing to determine the success of smallmouth bass natural recruitment and the status of largemouth and spotted bass populations. Fall gill netting was conducted to evaluate the stocking success of hybrid striped bass and to measure other fish population trends.

Largemouth bass abundance was up from 2003 and fell into the acceptable value range for a quality fishery. The abundance of bass < 200mm increased but other length groups remained stable or declined slightly. Body condition values were just below acceptable levels for each size group. Smallmouth bass abundance declined; most fish were in the >300mm size group. Daytime electrofishing may have biased the abundance level.

Hybrid striped bass abundance continued to be high, and fish > 500mm increased slightly. Body condition values and growth rates have remained stable but are still marginal compared to regional averages. White bass abundance increased and continued to represent a quality fishery.

Crappie abundance and size structure continued to improve since the low 2001 survey. Body condition of crappie improved, and growth rates remained above the regional average. Channel, blue and flathead catfishes continued to have low abundance and an unsatisfactory size structure.

Gizzard shad provided a marginal source of prey in 2004. Threadfin shad abundance in 2004 increased, indicating that the attempt to reestablish this species, through restocking, was successful. Pelagic predator species such as crappie, hybrid and white bass, showed improvement in body condition values for most size groups in 2004, resulting from the reintroduction of threadfin shad in Skiatook Lake.

Recommendations include the stocking of florida largemouth bass fingerlings and hybrid striped bass fingerlings; aquatic vegetation transplanting projects; and fish population surveys by spring night electrofishing and fall gill netting in 2005.

INTRODUCTION

Skiatook Lake impounds Hominy Creek, 8 km west of Skiatook in Osage County, Oklahoma (Figure 1). Skiatook Lake covers 4,266 surface hectares and was constructed in 1984 by the U.S. Army Corps of Engineers. Skiatook Lake has a mean depth of 9.7m, a shoreline development ratio of 11.3, a water exchange rate of 0.4, and a secchi disc visibility of around 173 cm in the main pool in August; turbidity is primarily from plankton. Fish habitat consists primarily of rock and flooded timber, with buoy marked brush piles scattered throughout the reservoir.

Past surveys have shown that largemouth bass, crappie, channel catfish and blue catfish abundance is relatively stable with some cyclic fluctuations. Smallmouth bass have become established and successfully reproduced from 1992 through 2003. Striped bass x white bass hybrid abundance has generally remained relatively high and acceptable since impoundment of the lake. Bluegill have remained abundant but gizzard shad annual abundance has fluctuated considerably.

A five year stage fill plan was implemented under a cooperative agreement between the Corps of Engineers and the Oklahoma Department of Wildlife Conservation. The lake was filled in annual stages until reaching normal pool elevation in early 1989. Seventeen large brush rows were constructed in the cleared area of the lake prior to impoundment. In 2004, ten new brush piles were constructed throughout the reservoir and marked with

buoys for anglers. In 2002 and 2003, aquatic vegetation was transplanted into the reservoir to establish weed beds for protective escape cover in largemouth bass habitat. Recent fish stockings include hybrid striped bass (annually since 1985). In 2002 and 2003, Florida largemouth bass were reintroduced into Skiatook Lake in order to enhance the genetic structure of the largemouth bass population. In 1998 threadfin shad first appeared in our samples and are probably the result of an angler stocking. A winter kill in December of 2000, eliminated them from the lake. The successful establishment of threadfin was accomplished through stockings in 2002. A summary of past fish stockings are shown in Table 1. A 356 minimum length limit was placed on all black bass prior to impoundment in order to prevent over harvest. In 1997, the length limit was removed on spotted bass to encourage harvest of smaller size fish and prevent stockpiling. In the fall of 2001, tissue samples from 50 largemouth bass, collected throughout the reservoir, were tested for the presence of Largemouth Bass Virus. Results concluded that the virus was present in the largemouth bass population. No fish kills have been reported in the history of the lake, although the likelihood of such an event exists and will be monitored closely in the future.

Skiatook Lake was sampled in 2004 by spring, day and night, electrofishing and fall gill netting to evaluate the status of stocked exotic and indigenous sport and forage fish species.

RESULTS

Largemouth Bass

1. Largemouth bass abundance from 2004 spring electrofishing (C/f=49.3) was above the minimum acceptable value for a quality fishery (C/f=40). The total bass C/f has increased slightly in recent samples (Table 2).
2. In 2004 spring electrofishing, the abundance of bass size groups <200mm and 200-299mm were in the acceptable ranges. Bass >300mm and >356mm were below the acceptable ranges for a quality fishery. Smaller bass have increased but larger size groups declined in abundance.
3. Body condition values (W_r) for all size groups of bass were just below the minimum values. Body condition values for all bass size groups have declined in recent samples.
4. Bass abundance has improved in 2004. Although size structure is balanced, abundance is unsatisfactory. Body condition values on quality size fish (>300mm and >356mm) and stock size fish (200-299)have shown improvement in Skiatook Lake during 2003. The increase in abundance of bass <300mm in length is encouraging and primarily due to higher summer/fall water levels in 2004. The decline in bass > 300mm is probably the result weak year classes from an extended drought in the summer of 2001,2002, and 2003 which dropped the lake elevation 5+ feet below normal pool by the fall, eliminating the majority of shoreline protective cover for young-of-the-year

bass. ODWC personnel transplanted aquatic vegetation in 2002 and 2003, attempting to establish weed beds in largemouth habitat throughout the lake. There has not been a recorded fish kill on Skiatook Lake due to the Largemouth Bass Virus (LMBV) and this condition will be closely monitored by area sportsmen and ODWC personnel in the future. With a normal rise in water level during the spring of 2005 and normal summertime temperatures, the largemouth bass population will continue to recover and improve to previous levels. Florida Largemouth Bass fingerlings were stocked into Skiatook Lake in 2002 and 2003 to establish the Florida gene into the largemouth population. Hopefully, this will increase the potential for trophy bass production in the future.

Spotted bass

1. Spotted bass abundance from 2004 spring night electrofishing (C/f=16.9) was considered to be inadequate for an acceptable fishery. It must be noted that sampling sites were in largemouth bass habitat, therefore, the abundance of spotted bass is significantly underestimated by this factor. The spotted bass is considered the dominate black bass species in Skiatook Lake. The total bass C/f has been declining in recent spring samples (Table 3).
2. In 2004 spring electrofishing, the abundance of all spotted bass size groups was below acceptable values. The abundance of all bass size groups has declined in recent spring samples.

3. Body condition values (W_r) were unsatisfactory for all bass >200mm, but satisfactory for all bass <200mm.

4. If sampling had occurred in spotted bass habitat, a more accurate picture of the spotted bass population could be obtained. The decline in abundance of spotted bass <200mm in length is probably due to the same factor that limits the largemouth abundance, mentioned above.

Smallmouth bass

1. Smallmouth bass abundance from 2004 spring night electrofishing (C/f=5.3) was below the minimum acceptable value for a quality fishery (C/f=15). The total bass C/f has been declined in recent samples (Table 4).

2. In 2004 spring electrofishing, the abundance of all size groups of bass, except fish >356mm, declined dramatically. The abundance of larger bass remained stable. All size groups have fluctuated in abundance compared to past spring samples.

3. Body condition values (W_r) were unsatisfactory for all smallmouth bass size groups except those > 356mm, which were acceptable. Larger smallmouth bass have shown a slight improvement in condition, but smaller fish have remained stable.

4. The abundance of smallmouth bass was drastically below the acceptable value. Part of the 2004 sample was collected during daylight hours, which may explain the low catch rate for smallmouth bass. Size structure data on larger adult fish is difficult to collect by electrofishing, due to the deeper

habitat occupied by mature fish. Anglers have caught numerous quality size smallmouth bass indicating acceptable abundance and condition. The poor recruitment of smallmouth bass in 2002 was evident to the angler upon reaching harvestable size in 2005.

Crappie

1. Crappie abundance from 2004 fall gill netting (C/f=0.19) was slightly below the minimum acceptable value for a quality fishery (C/f=0.20). The total crappie C/f has increased from a trend of low abundance that was started in the 2001 sample (Table 5).
2. The abundance of crappie all crappie size groups were satisfactory. The abundance of crappie size groups have increased in recent years.
3. Body condition values (W_r) were satisfactory or nearly so for all crappie size groups. Condition values for crappie >200mm have been satisfactory and stable, while smaller size groups have generally been slightly below the acceptable value in recent sample years.
4. Growth rates were above acceptable levels for all year classes of crappie collected (Table 6). Length at age values increased for Age I and Age II fish. The crappie population appeared to be comprised primarily of Age I and Age II fish (Figure 2).
5. Crappie abundance was marginal but indicated improvement in 2004. Crappie growth rates are above the regional average,

indicating that the fish are moving through to harvestable size in three years. The strong 2002 and 2003 year classes should make up the bulk of harvestable size crappie in 2005.

White bass

1. White bass abundance from 2004 fall gill netting (C/f=0.54) was well above the minimum acceptable value for a quality fishery (C/f=0.10). The total white bass C/f has drastically increased since the 2003 sample (Table 7).
2. The abundance of white bass was satisfactory for all size groups in 2004. Fish <300mm in length have increased in abundance and those >300mm have decreased.
3. Body condition values (W_r) were satisfactory for all white bass size groups. Values have increased slightly since the 2003 sample.
4. White bass abundance has nearly doubled since 2003. The population is comprised primarily of small <300mm fish. The white bass will likely continue to be highly cyclic due to erratic annual recruitment. Body condition values have increased indicating that forage is not limiting.

Striped bass x white bass hybrids

1. Hybrid striped bass abundance from 2004 fall gill netting (C/f=0.62) was well above the minimum acceptable value for a quality fishery (C/f=0.10). The total hybrid C/f has increased to a 5 year high (Table 8).

2. The abundance of all hybrid striped bass size groups was satisfactory. Abundance of fish <499mm increased dramatically, and hybrids >500mm slightly increased in 2004.
3. Body condition values were unsatisfactory for all size groups of hybrids in 2004, but improvement was indicated in all fish <499mm. Condition values for larger hybrids > 500mm decreased.
4. Nine year classes, Age 0 to 9, were represented in the hybrid striped bass sample, indicating good to excellent survival of stocked fish (Figure 3). Growth rates were above regional means for Ages 1 and 2, but below the mean for Age 3 and 4. Length at age values for younger fish (Age I and Age II) showed the largest improvement from 2003 data (Table 9). Overall, Skiatook hybrids continued a long trend of good to excellent growth.
5. Abundance and size structure indicated the presence of a quality hybrid striped bass fishery in Skiatook Lake. Body condition values show improvement in smaller fish, but larger hybrids remain low, however, they have rebounded since the threadfin shad kill significantly reduced the forage base during 2001. Skiatook Lake continues to sustain a high abundance of hybrids. Even with the reintroduction of shad, forage remains limited and will continue to restrict the growth rates of hybrids at the current abundance level. Anglers can expect good hybrid fishing with more fish available in 2005.

Walleye

1. Walleye abundance from 2004 fall gill netting (C/f =0.07)was a lake record high since impoundment (Table 10). Although the abundance has dramatically increased in 2004 over all recent sample years it is still below acceptable values for a quality fishery.
2. The abundance of walleye size groups <300mm and 300-499mm were below acceptable values, fish > 400mm in length had acceptable abundance. Larger walleye have shown a dramatic increase in abundance in recent samples, while smaller fish have remained stable.
3. Body condition values (W_r) were slightly below satisfactory levels for all size groups of walleye in 2004. Condition values have remained fairly stable in recent years.
4. Walleye abundance, size structure and body condition have improved and are providing a marginal fishery in 2004. Anglers should expect to benefit from the good abundance of harvestable size walleye in 2005.

Channel catfish

1. Channel catfish abundance from 2004 fall gill netting (C/f=0.18) was slightly below the minimum acceptable value for a quality fishery (C/f=0.20). The total channel catfish C/f has fluctuated in recent sample years (Table 10).
2. The abundance of channel catfish <300mm were acceptable, but larger catfish size groups were below acceptable values. The

abundance of all size groups has been below acceptable vales during most sample years.

3. Body condition values (W_r) were unsatisfactory for all channel catfish size groups, except the larger > 400mm group was satisfactory. Condition values have been unsatisfactory for all size groups in recent years.

4. Past catch rates indicate the channel catfish population will remain low or marginally acceptable in relative abundance possibly due to predation on Age 0 fish.

Blue catfish

1. Blue catfish abundance in 2004 fall gill netting (C/f= 0.13) was above the minimum acceptable value for a quality fishery (C/f=0.10). The total blue catfish C/f has increased in 2003 and 2004 over earlier sample years (Table 11). Size groups of blue catfish indicate natural recruitment is sustaining the population and it should be providing anglers good opportunities in 2005.

Flathead catfish

1. Two (2) flathead catfish were collected by 2004 fall gill netting (Table 12). Gill netting does not adequately sample to population abundance of flathead catfish. A low population abundance is characteristic of a lake this size. Predation of young and the lack of adequate numbers of sexually mature individuals may be a factor in limiting abundance.

Gizzard shad

1. Shad abundance from 2004 fall gill netting (C/f=0.18) was slightly below the minimum acceptable value for a quality forage supply (C/f= >0.20, Table 13). Gizzard shad abundances have fluctuated in recent samples.
2. The abundance of shad <200mm collected by fall gill netting (C/f=0.09) was slightly below the minimum acceptable value (C/f=0.10). The abundance of shad < 200mm have decreased substantially since 2003.
3. Gizzard shad abundance and size structure indicated they were providing a marginal source of prey in 2004. The catch rate of Age 0 gizzard shad in the smaller size *Shad Meshes* was 0.02 (Table 13), which indicated that there was a spawn, but these fish were most likely consumed by the large number of predators in Skiatook Lake. Age 0 gizzard shad abundance in 2004 has decreased since the 2002 sample(C/f=0.05).

Threadfin shad

1. Threadfin shad abundance from 2004 fall gill netting (C/f=0.69) indicated the highest abundance since restocking in 2002 (Table 14). The winter kill in December of 2000 severely reduced or eliminated them from the reservoir in 2001. Threadfin abundances have varied since they were first observed in 1998, but they are a significant forage base in Skiatook Lake. Also, abundance of hybrid shad in 2004 (C/f=.06) contributes to the forage base significantly. It is apparent with the reestablishment of threadfin shad back

into Skiatook Lake, condition values for predators have improved compared to 2001 levels. The increase in threadfin abundance may be responsible for the decrease in gizzard shad abundances.

Non-game fish

1. Non-game fish abundance in Skiatook Lake is relatively low (C/f=0.09) and has remained relatively stable in recent years, although individual species abundance has fluctuated annually. The prominent fish in this group are the smallmouth buffalo, river carpsucker, freshwater drum, and spotted sucker (Table 15).

RECOMMENDATIONS

Aquatic Habitat Manipulation

1. The continuation of Water willow (*Justicia americana*) and /or Common reed (*Phragmites*) introductions in protected coves and other largemouth bass habitat, to enhance the escape cover for small bass and forage fish and provide suitable areas for angling opportunities.

Fish Stockings

1. Florida largemouth bass stockings should be continued into Skiatook Lake at a rate of 10, 1 inch fingerlings, per acre (105,400) in the summer of 2006. The purpose of this stocking is to introduce the Florida Largemouth Bass *gene* into the

native bass population, resulting in production of the F_1 hybrid, which has the growth potential to produce trophy size bass for Skiatook anglers. It is not to supplement or increase largemouth bass numbers in Skiatook Lake.

2. Hybrid striped bass x white bass fingerlings should be stocked at a rate of 10 fish per acre in the spring of 2005 to maintain a put, grow and take fishery at an acceptable catch rate. Consideration to reduce this stocking rate, due to declines in body condition and growth rates should be assessed in 2005.

Fish Surveys

1. Spring night electrofishing should be conducted in 2005 to monitor the effects of the 356mm minimum length limit and high angling pressure on "black" bass populations; and to determine the extent of smallmouth bass natural recruitment.
2. A fall gill netting survey should be conducted in 2005 to evaluate the survival of stocked hybrid striped bass and to monitor the abundance and size structure of other game and forage fish species.

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Table 1. Species, number and size of fish stocked in Skiatook Lake from 1988 - 2004.

DATE	SPECIES	NUMBER	SIZE
1988	Walleye	92,000	1½ inch
1988	Hybrid striped bass	91,693	1½-2½ inch
1988	Channel catfish	71,699	8 inch
1988	Blue catfish	21,721	4 inch
1989	Walleye	105,220	1½ inch
1989	Hybrid striped bass	50,000	1½-2½ inch
1990	Hybrid striped bass	100,070	1½ inch
1990	Smallmouth bass (Lake Strain)	109,506	1½ inch
1990	Channel catfish	260,298	3-5 inch
1991	Smallmouth bass (Lake Strain)	105,200	1½ inch
1991	Hybrid striped bass	104,605	1½ inch
1992	Hybrid striped bass	104,200	1-1½ inch
1992	Channel catfish	260,500	3 inch
1993	Hybrid striped bass	38,500	1 inch
1993	Hybrid striped bass	67,000	1.25 inch
1994	Hybrid striped bass	104,925	1.5 inch
1995	Hybrid striped bass	82,654	1.5 inch
1995	Hybrid striped bass	21,400	1.75 inch
1996	Hybrid striped bass	105,000	1.25 inch
1997	Hybrid striped bass	98,313	1.75 inch
	Hybrid striped bass	40,710	2.0 inch
1998	Hybrid striped bass	105,000	1.5 inch
1999	Hybrid striped bass	105,400	1.5 inch
2000	Hybrid striped bass	10,730	2.5 inch
	Hybrid striped bass	95,000	1.75 inch
2001	Hybrid striped bass	105,000	1.25 inch
2002	Hybrid striped bass	110,450	1.5 inch
	Florida largemouth bass	7,585	3.0 inch
2003	Hybrid striped bass	110,425	1.5 inch
	Florida largemouth bass	74	14 inch
	Florida largemouth bass	103,000	1.5 inch
2004	Hybrid striped bass	108,000	2.0 inch

Table 2. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **largemouth bass** collected by spring electrofishing from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥40)		<200 mm (15-45)		200-299 mm (15-30)		≥300 mm (≥15)		≥356 mm (≥10)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1986	98	14.1	6.5	99	5.9	101	1.7	96	0.4	99
1987	208	50.1	18.6	84	22.9	93	8.6	99	2.9	110
1988	187	98.9	26.5	79	42.3	93	30.2	102	8.5	108
1989	179	49.2	11.8	82	14.8	89	22.5	100	10.4	106
1990	178	45.2	7.6	81	8.6	90	28.9	97	18.8	100
1991	189	61.0	13.9	81	20.6	86	26.5	96	18.1	99
1992	202	56.7	12.6	78	15.4	85	28.7	93	13.5	97
1994*	228	74.8	8.9	92	29.5	87	36.4	88	10.5	89
1996*	164	43.0	3.4	86	10.5	87	29.1	86	13.4	87
1997*	173	48.9	8.5	87	16.7	84	23.7	84	10.7	87
1998*	113	55.4	15.7	87	19.6	83	20.1	87	9.8	87
1999**	157	38.6	21.6	105	8.8	99	8.1	91	2.5	94
2000*	166	83.0	23.0	91	30.5	91	29.5	87	16.0	87
2001*	180	58.4	12.6	86	27.2	83	18.5	80	5.8	82
2002*	112	46.1	9.1	90	18.5	86	18.5	86	9.1	89
2003*	162	36.0	10.4	89	12.7	88	13.1	89	6.4	90
2004	111	49.3	20.4	82	16.4	85	12.4	85	4.0	86

* Spring night electrofishing
**Fall night electrofishing

Table 3. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **spotted bass** collected by spring electrofishing from Skiatook Lake. Acceptable W_r values are ≥90.

	Total		<200 mm		200-299 mm		≥300 mm		≥356 mm	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1986	11	1.6	1.4	110	1.7	92				
1987	16	3.9	1.3	90	2.0	105	2.0	104	0.3	117
1988	13	6.9	4.2	75	2.1	114	0.5	84		
1989	9	2.5			1.6	108	0.8	108		
1990	4	1.0			0.5	100	0.5	101	0.3	104
1991	25	8.1	0.3	82	2.3	98	5.4	100	1.0	105
1992	37	10.4	1.7	91	5.6	95	3.1	95	0.8	93
1994*	149	48.9	16.1	79	23.3	79	9.5	81	1.0	80
1996*	172	45.1	6.8	72	18.1	79	20.2	79	4.2	82
1997*	88	24.9	4.8	78	15.5	76	4.5	77	0.8	82
1998*	63	30.9	9.8	71	15.7	76	6.9	82	1.0	83
1999**	138	33.9	19.2	103	9.0	96	5.7	89		
2000*	56	28.0	7.0	85	12.0	88	9.0	84	1.0	78
2001*	65	31.0	12.4	90	14.3	89	4.3	84	1.0	85
2002*	62	25.5	7.0	86	16.9	87	1.6	85	0.4	91
2003*	91	20.2	4.9	91	12.9	90	2.4	87	0.2	85
2004	38	16.9	2.0	91	12.9	86	1.6	80	0	

* Spring night Electrofishing
** Fall night electrofishing

Table 4. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **smallmouth bass** collected by electrofishing from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥15)		<200 mm -		200-299 mm -		≥300 mm -		≥356 mm (≥2)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1991[1]	80	30.2	14.3		16.2					
1992[3]	18	5.1	2.3	76	2.5	97	0.3	112		
1993[1]	62	14.8	7.7		3.6	81	3.6	82	0.5	82
1994[2]	47	15.4	5.6		2.0	86	7.9	92	3.3	94
1996[2]	54	14.2	4.5	77	8.1	78	1.6	78	0.3	82
1997[2]	56	15.8	6.8		6.8	81	2.3	80	0.8	78
1998[2]	63	30.9	17.2		8.3	78	5.4	82	1.5	89
1999[1]	78	19.2	12.0	102	4.4	92	2.7	86	0.7	78
2000[2]	34	17.0	3.0	91	6.5	81	7.5	79	2.0	80
2001[2]	49	23.3	20.5	84	1.9	84	1.0	75		
2002[2]	10	4.1	2.5	79	1.2	87	0.4	77	0.4	77
2003[2]	83	18.4	2.7	86	13.1	84	2.7	81	0.9	87
2004	12	5.3	1.8		0.9	84	1.8	80	0.9	90

[1] Fall night electrofishing
[2] Spring night electrofishing
[3] Spring daytime electrofishing

Table 5. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **crappie** collected by gill netting from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥.20)		<200 mm (.05-.30)		≥200 mm (≥.08)		≥250 mm (≥.04)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1986	55	0.22	0.13		0.09		0.02	
1987	37	0.17	0.08	84	0.09	97	0.02	96
1988	52	0.22	0.08	88	0.14	96	0.03	95
1989	42	0.19	0.08	89	0.11	91	0.01	93
1990	33	0.15	0.04	87	0.11	94	0.02	92
1991	42	0.19	0.04	84	0.15	93	0.05	92
1992	22	0.09	0.04	82	0.05	87	0.02	86
1993	34	0.14	0.06	80	0.08	92	0.05	90
1994	24	0.11	0.04	87	0.06	94	0.04	98
1995	61	0.24	0.12	87	0.12	92	0.01	96
1996	48	0.22	0.16	93	0.06	89	0.03	86
1997	29	0.14	0.11	88	0.03	87	0.01	94
1998	49	0.23	0.15	83	0.08	88	0.05	92
1999	49	0.23	0.09	89	0.14	93	0.08	94
2000	43	0.19	0.03	86	0.16	89	0.12	89
2001	17	0.07	0.06	94	0.01	84	0.00	92
2002	25	0.11	0.09	85	0.02	87	0.00	95
2003	25	0.11	0.07	87	0.05	92	0.03	93
2004	43	0.19	0.07	89	0.13	93	0.08	93

Table 6. Mean length at age of **crappie** collected by gill netting from Skiatook Lake. Numbers in parentheses represent values for acceptable growth rates.

Year	Age 1 (≥160 mm)	Age 2 (≥200 mm)	Age 3 (≥225 mm)	Age 4 (≥250 mm)
1992	167	224	246	
1993	157	236	260	
1994	140	237	313	277
1995	164	225	241	
1996	141	218	283	275
1997	165	186	238	
1998	169	198	256	345
1999	181	252	267	283
2000	181	246	269	
2001	172	233	263	
2002	174	210	247	307
2003	164	242		
2004	192	253	290	263
Lake mean	**167**	**228**	**264**	**292**

Table 7. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **white bass** collected by gill netting from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥.10)		<200 mm (≥.03)		200-299 mm (≥.05)		≥300 mm (≥.02)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1993	11	0.05			0.04	101	<0.01	97
1994	10	0.04	<0.01	90	0.01	90	0.03	99
1995	23	0.09	0.01	92	0.02	96	0.06	98
1996	73	0.34	0.04	89	0.03	94	0.27	94
1997	8	0.04			0.01	85	0.02	93
1998	40	0.19	0.01	87	0.04	85	0.13	92
1999	127	0.60	0.13	90	0.39	93	0.08	94
2000	124	0.53	0.05	88	0.25	87	0.24	86
2001	33	0.14	0.02	79	0.02	78	0.10	76
2002	32	0.14	0.03	87	0.06	84	0.05	86
2003	51	0.24	0.03	82	0.05	84	0.15	85
2004	120	0.54	0.21	91	0.22	91	0.11	90

Table 8. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **striped bass x white bass hybrids** collected by gill netting from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥.10)		<300 mm (≥.03)		300-499 mm (≥.05)		≥500 mm (≥.02)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1986	34	0.14			0.14			
1987	22	0.10	0.04	96	0.06	117		
1988	152	0.65	0.41	93	0.20	87	0.03	102
1989	79	0.37	0.02	96	0.30	87	0.05	92
1990	44	0.20	0.15	92	0.04	89	0.01	93
1991	73	0.33	0.07	88	0.23	89	0.03	87
1992	46	0.19	0.03	85	0.11	85	0.05	86
1993	207	0.85	0.58	96	0.24	90	0.04	84
1994	74	0.33	0.08	91	0.23	90	0.01	86
1995	136	0.54	0.27	93	0.24	91	0.03	85
1996	95	0.44	0.07	81	0.31	91	0.06	87
1997	93	0.43	0.04	79	0.31	84	0.08	94
1998	98	0.46	0.15	80	0.25	87	0.05	80
1999	154	0.73	0.23	87	0.43	86	0.07	74
2000	94	0.41	0.10	82	0.23	81	0.07	77
2001	98	0.42	0.03	75	0.33	77	0.06	74
2002	96	0.41	0.02	83	0.27	80	0.12	87
2003	83	0.38	0.11	83	0.23	79	0.05	85
2004	133	0.62	0.24	89	0.33	87	0.06	78

Table 9. Mean length at age (mm) of **striped bass hybrid** collected by gill netting from Skiatook Lake, 1990 to 2001. Numbers in parentheses represent regional mean values for each age.

Year	Age 1 (369mm)	Age 2 (446mm)	Age 3 (492mm)	Age 4 (539mm)
1990	419	487		580
1991				
1992	388	481	540	566
1993	396	456	499	523
1994	412	460	478	511
1995	381	471	481	482
1996	391	453	499	529
1997	372	448	519	537
1998	377	444	495	527
1999	384	440	474	497
2000	381	448	470	501
2001	366	432	471	484
2002	344	457	499	517
2003	350	429	507	510
2004	392	449	478	490
Mean	**382**	**454**	**493**	**518**

Table 10. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **walleye** collected by gill netting from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are $\geq$90.

	Total (>.10)		<300 mm (≥.06)		300-399 mm (≥.02)		≥400 mm (≥.02)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1987	1	<0.01					<0.01	96
1988	0							
1989	2	0.01	<0.01	85			<0.01	93
1990	3	0.01			<0.01	79	0.01	84
1991	1	<0.01					<0.01	88
1992	1	<0.01					<0.01	88
1993	8	0.03	0.01	96			0.03	88
1994	6	0.03	<0.01	88			0.02	87
1995	2	0.01			<0.01	84	<0.01	81
1996	2	0.01	0.01	88				
1997	4	0.02			0.01	84	0.01	85
1998	4	0.02			0.01	84	0.01	82
1999	2	0.01					0.01	82
2000	0							
2001	5	0.02						
2002	6	0.03	0.01	88			0.02	92
2003	7	0.03	0.02	88	0.01	95	0.01	86
2004	15	0.07	0.01	87	0.01	85	0.04	86

Table 11. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **channel catfish** collected by gill netting from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥.20)		<300 mm (≥.10)		≥300 mm (≥.10)		≥400 mm (≥.05)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1986	10	0.04	0.03		0.01		0.01	
1987	22	0.10	0.09	81	0.01	87		
1988	31	0.13	0.09	86	0.04	83	0.02	87
1989	44	0.20	0.02	89	0.18	85	0.01	119
1990	27	0.12	0.04	89	0.09	86	0.02	89
1991	28	0.13	0.03	82	0.10	83	0.01	78
1992	16	0.07	0.02	86	0.04	86	0.01	88
1993	15	0.06	0.03	88	0.03	81	<0.01	70
1994	15	0.07	0.02	92	0.05	87	0.03	94
1995	32	0.13	0.05	86	0.08	83	0.02	87
1996	47	0.22	0.06	83	0.16	81	0.06	82
1997	25	0.12	0.02	91	0.09	84	0.05	86
1998	12	0.06	0.01	82	0.05	84	0.02	86
1999	24	0.11	0.05	80	0.07	82	0.02	85
2000	46	0.20	0.08	82	0.12	83	0.06	85
2001	33	0.14	0.06	80	0.08	86	0.05	90
2002	52	0.22	0.15	86	0.07	87	0.03	91
2003	24	0.11	0.06	80	0.06	86	0.04	87
2004	41	0.18	0.10	83	0.08	83	0.03	92

Table 12. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **blue catfish** collected by gill netting from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total (≥.10)		<300 mm (≥.05)		≥300 mm (≥.05)		≥400 mm (≥.03)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1986	5	0.02	0.00		0.02			
1987	5	0.02	0.01	94	0.01	105		
1988	5	0.02	0.01	96	0.01	120	0.00	155
1989	3	0.01	0.00	102	0.01	107	0.01	107
1990	4	0.02			0.02	114	0.02	114
1991	1	0.00					0.00	96
1992	2	0.01			0.01	102	0.01	102
1993	4	0.02			0.02	107	0.02	107
1994	0							
1995	0							
1996	1	0.01			0.01	100	0.01	100
1997	5	0.02	0.01	108	0.01	109	0.01	109
1998	3	0.01	0.01	92	0.01	116	0.01	116
1999	7	0.03	0.03	94	0.01	90		
2000	16	0.07	0.04	93	0.03	85	<0.00	90
2001	8	0.03	0.02	93	0.02	92	0.01	94
2002	9	0.04	0.01	88	0.03	86	0.01	92
2003	46	0.23	0.12	90	0.11	86	0.01	88
2004	28	0.13	0.07	88	0.06	88	0.01	88

Table 13. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **flathead catfish** collected by gill netting from Skiatook Lake. Acceptable W_r values are ≥90.

	Total		<300 mm		≥300 mm		≥500 mm		≥600 mm		≥700mm	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W^r
1986	1	0.00			0.00	124	0.00	124				
1987	1	0.01			0.01	84	0.01	84	0.01	84		
1988	0											
1989	2	0.01			0.01	92	0.00	95				
1990	1	0.01			0.01	94	0.01	94	0.01	94		
1991	3	0.01			0.01	103	0.01	103	0.01	104	0.00	86
1992	0											
1993	3	0.01			0.01	100	0.01	100	0.01	100		
1994	1	0.00			0.00	89						
1995	2	0.01			0.01	91	0.01	91				
1996	2	0.01			0.01	84	0.01	79				
1997	0											
1998	1	0.01			0.01	78						
1999	2	0.01			0.01	84						
2000	5	0.02			0.02	82	0.01	99	>0.00	85		
2001	1	0.01			0.01	71						
2002	3	0.01			0.01	81	0.01	81	0.00	81		
2003	3	0.02			0.02	79	0.01	83	0.01	83		
2004	2	0.01			0.01	82						

Table 14. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of **gizzard shad** collected by spring electrofishing and gill netting from Skiatook Lake. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥90.

	Total* (≥40)		<200 mm* (≥20)		Total[2] (≥.20)		<200 mm[2] (≥.10)		Age 0[1] (<140mm)	
Year	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	No.	C/f
1986	234	59.0	55.0		0.10		0.10			
1987	274	89.3	83.7	91	0.16	81	0.15	80		
1988	172	113.9	95.4	83	0.03	89	0.03	92		
1989	148	42.3	38.6	86	0.20	82	0.19	83		
1990	222	79.9	71.2	79	0.12	86	0.10	86		
1991	114	36.8	26.1	87	0.03	75	0.02	74		
1992	76	21.3	16.9	86	0.21	85	0.15	82		
1993					0.31	84	0.19	84		
1994*	162	79.0	25.9	85	0.06	82	0.04	82		
1995					0.29	79	0.27	79		
1996*	169	157.9	131.8	89	0.40	81	0.30	81		
1997*	165	101.9	62.3	81	0.26	86	0.08	87		
1998*	40	19.6	8.3	87	0.13	79	0.07	82		
1999[3]	138	78.8	39.4	86	0.15	76	0.09	78		
2000*	97	48.5	16.0	86	0.37	79	0.14	82		
2001*	171	162.9	36.2	79	0.23		0.02		19	0.08
2002*					0.20		0.15		12	0.05
2003					0.42		0.24		12	0.06
2004					0.18		0.09		4	0.02

[1]Age 0 shad (<140mm)
[2] Gill netting
* Spring night electrofishing
[3] Fall night electrofishing

Table 15. Total number (No.) and catch rates (C/f) of **threadfin shad** and **hybrid shad** collected by spring electrofishing, gill netting, and fall night electrofishing from Skiatook Lake.

	Threadfin shad						Hybrid Shad	
	Total[1]		Total[2]		Total[3]		Total	
Year	No.	C/f	No.	C/f	No.	C/f	No.	C/f
1998			2	0.01	-	-		
1999			19	0.09	-	-		
2000			36	0.16	-	-	23	0.10
2001			0		0		8	0.03
2002			22	0.09	20	0.09	4	0.02
2003			93	0.43	59	0.28	24	0.12
2004			152	0.69	97	0.44	7	0.03

[1] Spring electrofishing
[2] Gill netting
[3] Age 0 shad (<125mm)

Table 16. Total number (No.) and catch rates (C/f) of **non-game** fish collected by gill netting from Skiatook Lake.

	CRP[1]		DRM[1]		SBF[1]		BBF[1]		RCS[1]		TOTAL	
Year	No.	C/f	No.	C/f	No.	C/f	No.	C/f	No.	C/f	No.	C/f
1986	31	0.13	3	0.01	25	0.10	3	0.01	3	0.01	65	0.26
1987	36	0.17	6	0.03	35	0.15	1	0.01	2	0.01	81	0.39
1988	14	0.06	9	0.04	18	0.03	1	0.00	10	0.04	42	0.17
1989	30	0.14	10	0.05	11	0.05	4	0.02	10	0.05	65	0.31
1990	3	0.01	5	0.02	11	0.05	0		7	0.03	26	0.18
1991	18	0.08	5	0.02	7	0.03	3	0.01	18	0.08	54	0.23
1992	13	0.05	6	0.02	25	0.10	3	0.01	17	0.07	64	0.25
1993	3	0.01	6	0.03	30	0.12	5	0.02	10	0.04	56	0.22
1994	4	0.02	8	0.04	10	0.04	4	0.02	16	0.07	43	0.19
1995	10	0.04	7	0.03	18	0.07	1	0.00	10	0.04	55	0.22
1996	6	0.03	4	0.02	21	0.10	6	0.03	17	0.08	55	0.26
1997	8	0.04	7	0.03	12	0.06	3	0.01	5	0.02	35	0.16
1998	9	0.04	15	0.07	13	0.06	4	0.02	8	0.04	52	0.24
1999	4	0.02	2	0.01	24	0.11			5	0.02	35	0.17
2000	3	0.01	6	0.03	17	0.07	9	0.04	7	0.03	48	0.21
2001			8	0.03	11	0.05			9	0.04	28	0.12
2002	3	0.01	4	0.02	2	0.01			3	0.01	12	0.05
2003	5	0.02	2	0.01	9	0.04	2	0.01	6	0.03	27	0.13
2004	0		2	0.01	12	0.05			6	0.03	21	0.09

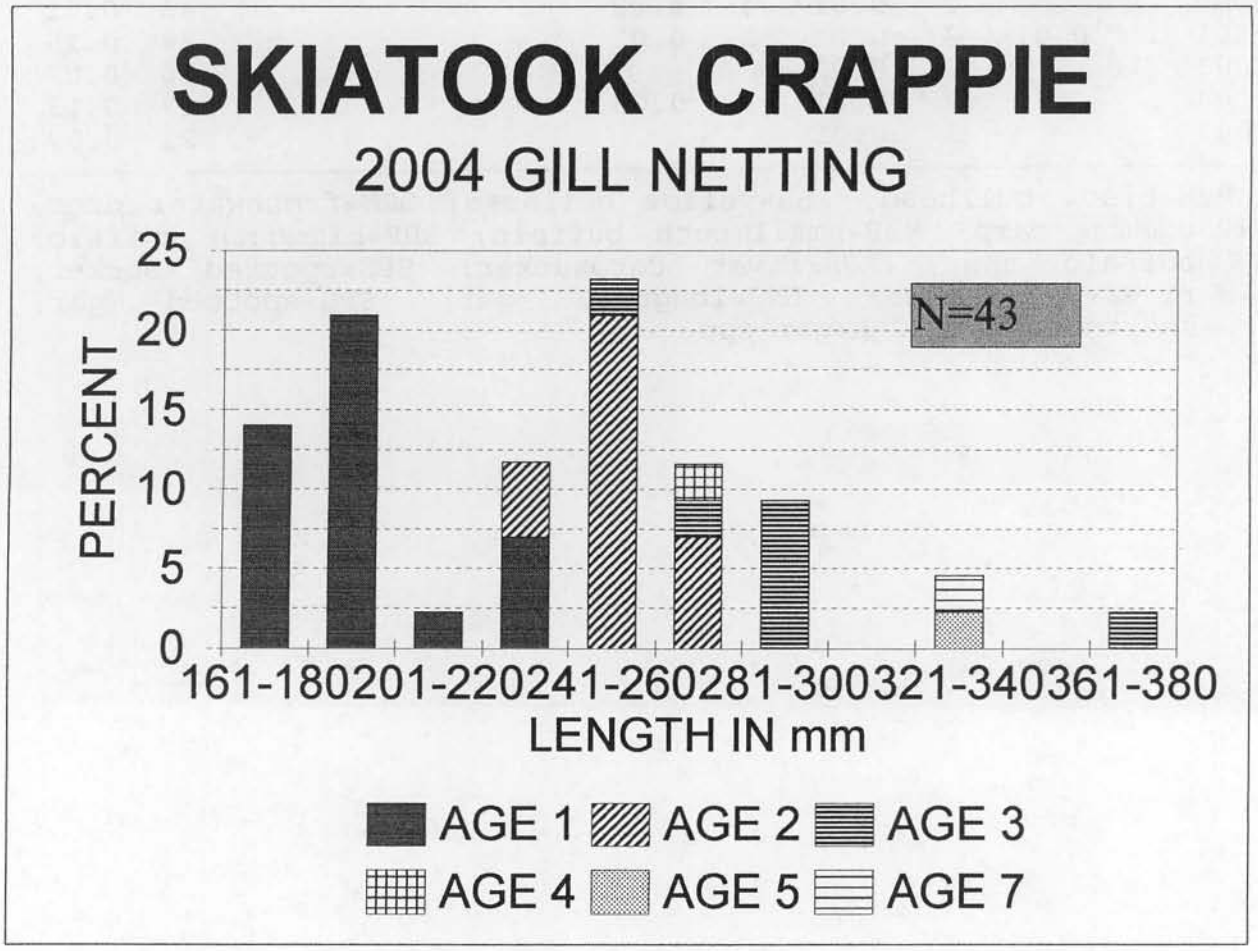
[1] BBH=black bullhead; YBH=yellow bullhead; DRM=freshwater drum; CRP=common carp; SBF=smallmouth buffalo; BBF=bigmouth buffalo; BUF=buffalo spp.; RCS=river carpsucker; RRH=river redhorse; LNG=longnose gar; SPG=spotted gar; SHG=shortnose gar; GAR=gar spp.

Table 16 (Cont). Total number (No.) and catch rates (C/f) of **non-game** fish collected by gill netting from Skiatook Lake.

	SPG[1]		SPS[1]		LNG[1]						Total	
Year	No.	C/f	No.	C/f	No.	C/f	No.	C/f	No.	C/f	No.	C/f
1993	1	0.00	1	0.00							56	0.22
1994			1	0.00							43	0.19
1995			7	0.03	2	0.01					55	0.22
1996			1	0.01							55	0.26
1998			2	0.01	1	0.01					52	0.24
2000			2	0.01	4	0.02					48	0.21
2001	1	0.01	3	0.01	2	0.01					34	0.15
2002			4	0.02							16	0.07
2003			2	0.01	1	0.00					27	0.13
2004			1	0.01							21	0.09

[1] BBH=black bullhead; YBH=yellow bullhead; DRM=freshwater drum; CRP=common carp; SBF=smallmouth buffalo; BBF=bigmouth buffalo; BUF=buffalo spp.; RCS=river carpsucker; SPS=spotted sucker; RRH=river redhorse; LNG=longnose gar; SPG=spotted gar; SHG=shortnose gar; GAR=gar spp.

Figure 2.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20
15
10
5
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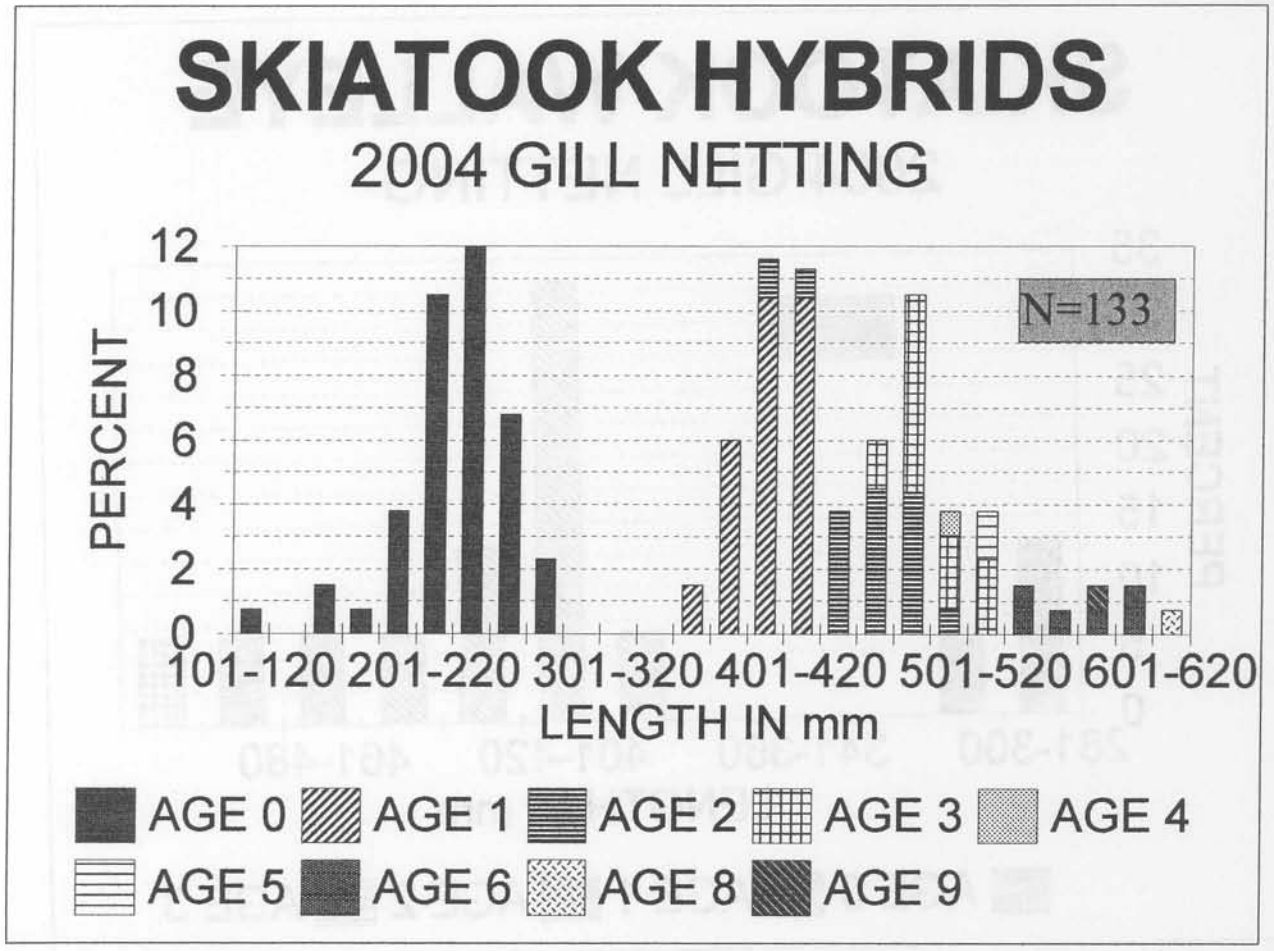
161-180
201-220
241-260
281-300
321-340
361-380
LENGTH IN mm
AGE 1
AGE 2
AGE 3
AGE 4
AGE 5
AGE 7

Figure 3.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2004 GILL NETTING
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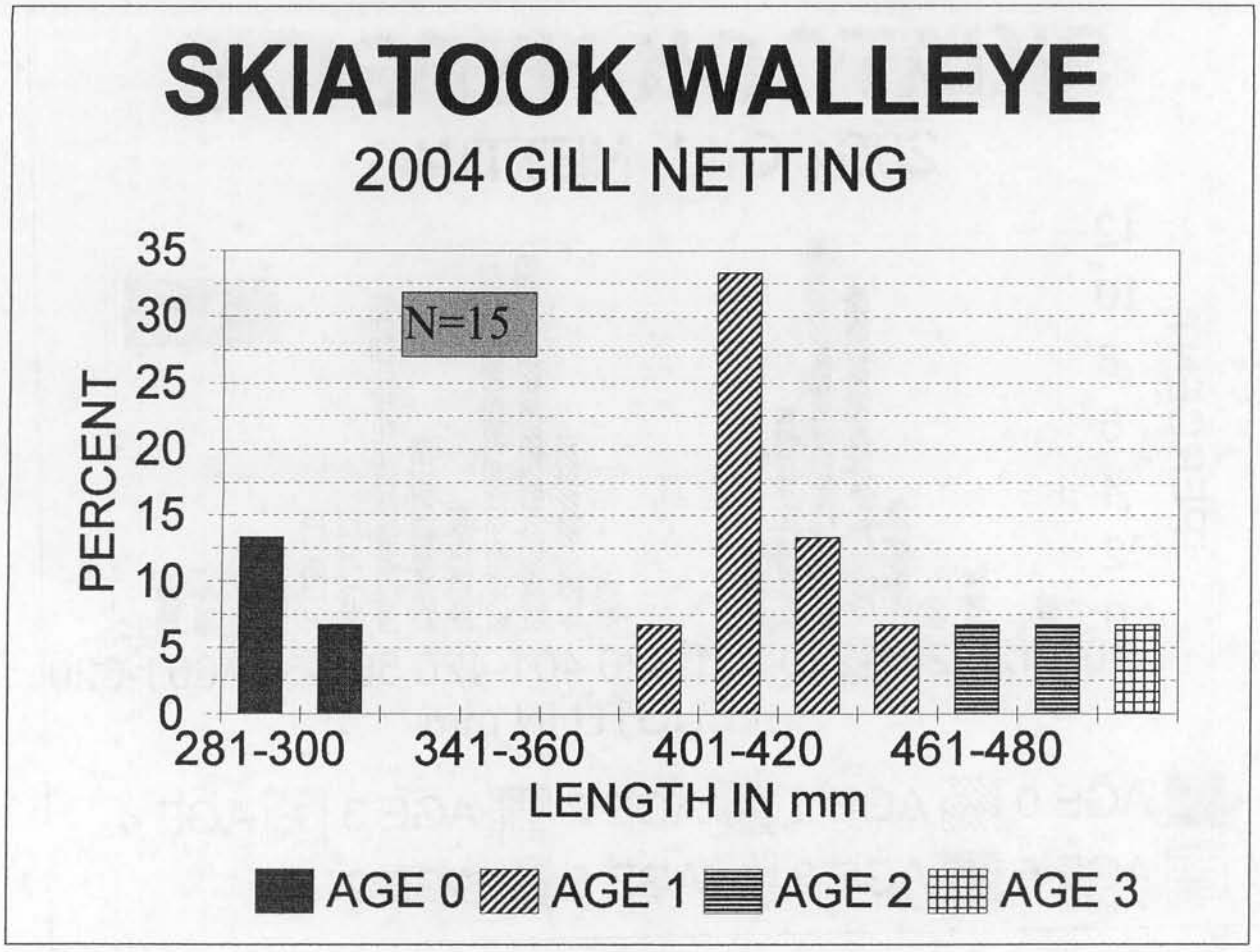
PERCENT
0
2
4
6
8
10
12
101-120
201-220
301-320
401-420
501-520
601-620
LENGTH IN mm
AGE 0
AGE 1
AGE 2
AGE 3
AGE 4
AGE 5
AGE 6
AGE 8
AGE 9


SKIATOOK WALLEYE
2004 GILL NETTING
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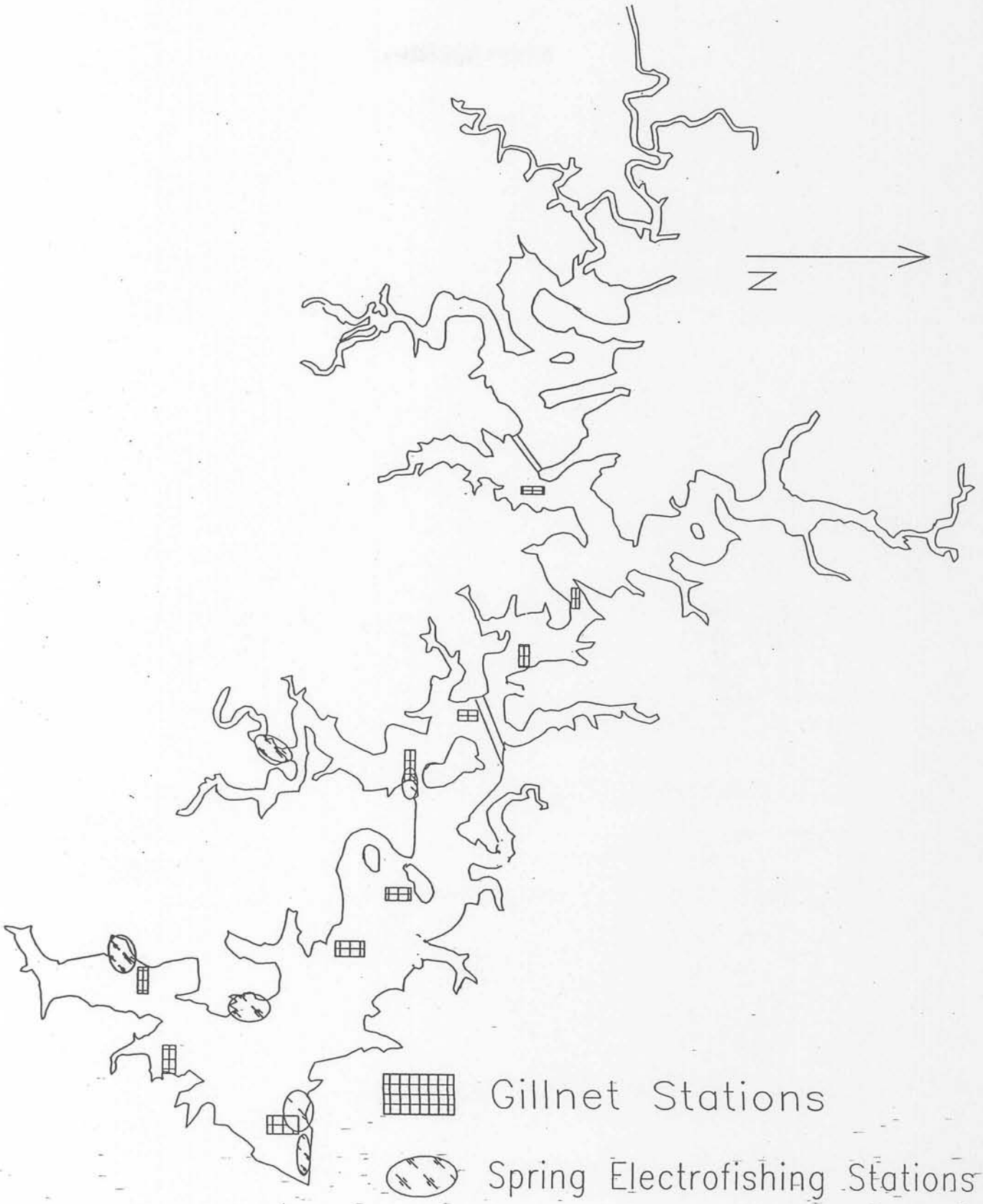
PERCENT
35
30
25
20
15
10
5
0
281-300
341-360
401-420
461-480
LENGTH IN mm
AGE 0
AGE 1
AGE 2
AGE 3

Figure 1.

SKIATOOK LAKE