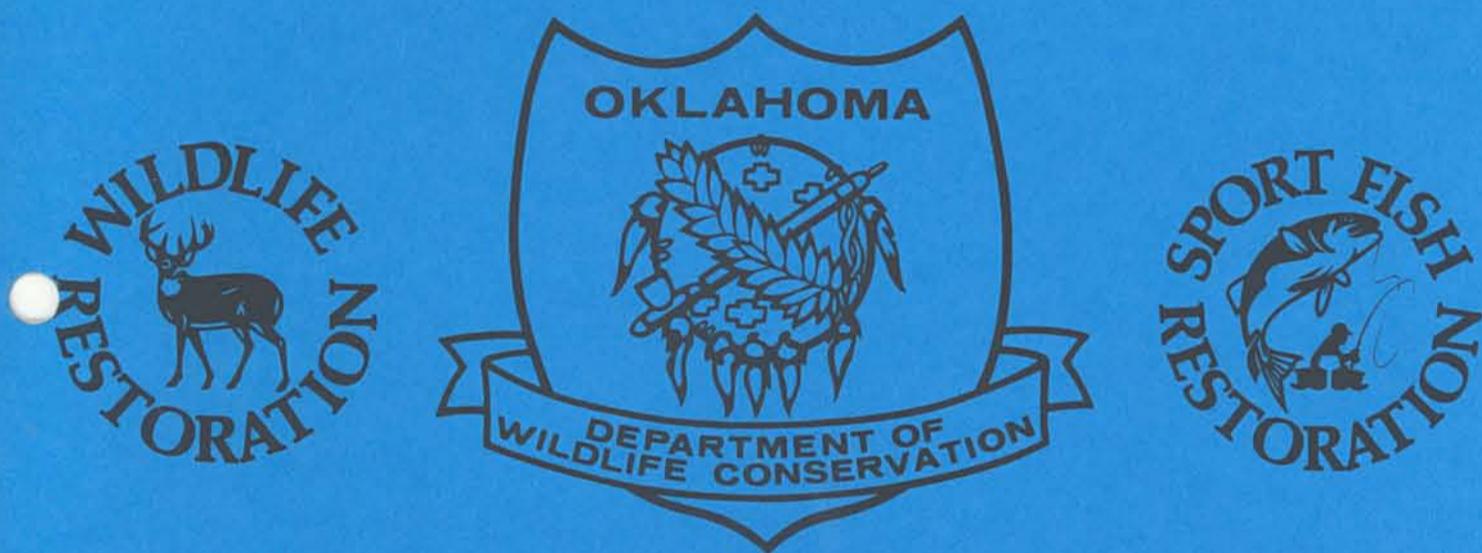


SURVEY REPORT
OKLAHOMA FISHERIES MANAGEMENT PROGRAM



FISH MANAGEMENT SURVEY AND RECOMMENDATIONS
FOR
LAKE BURTSCHI
1993

Performance Report

Project No. F 44-D-5

State: Oklahoma

Project Title: Oklahoma Fisheries Management Program

Study Title: Surveys and Recommendations - Lake Burtschi

Period Covered: 1 January 1952 - 31 December 1952

Job Performance Report

LAKE BURTSCHI

ABSTRACT

Oklahoma Fisheries Management Program

Lake Burtschi was sampled by fall gillnetting in 1952 and

spring electrofishing in 1952 and 1953. Surveys were sampled by

Federal Aid Project No. F 44-D-5

Fall night electrofishing in 1952. Larval catch data abundance was

high; spring electrofishing data in 1952 and 1953 were 14 and 54,

Fish Management Survey and Recommendations

respectively. However, numbers of bass <math>< 100\text{mm}</math> in length were

low. Catch numbers were low in all sample gears. Surveys

for

stocking success was good in 1952, the fall night electrofishing

CVE was 190. The channel catfish abundance (CVE=0.56) in the

LAKE BURTSCHI

1952 gillnet sample was three times the minimum acceptable value

for a quality fishery. Alewife and striped shad abundance was

also high. Numbers of bluegill <math>< 100\text{mm}</math> increased.

Recommendations were made to reestablish fish structures,

continue the fertilization program, and continue stocking efforts

later than past surveys. Channel catfish growout and smeltout

data. Night electrofishing in fall 1954 to

Prepared by Paul Watkins

evaluate smeltout bass and surveys stocking success. Spring

electrofishing should be conducted in 1953 to assess the

fertilization program.

Performance Report

State: Oklahoma

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LAKE BURTSCHI

ABSTRACT

Lake Burtschi was sampled by fall gillnetting in 1992 and spring electrofishing in 1992 and 1993. Saugeye were sampled by fall night electrofishing in 1993. Largemouth bass abundance was high; spring electrofishing C/fs in 1992 and 1993 were 74 and 54, respectively. However, numbers of bass <200mm in length were low. Crappie numbers were low in all sample gears. Saugeye stocking success was good in 1993; the fall night electrofishing C/f was 150. The channel catfish abundance (C/f=0.56) in the 1992 gillnet sample was three times the minimum acceptable value for a quality fishery. Bluegill and gizzard shad abundance was also high. Numbers of bluegill ≥ 150 mm increased.

Recommendations were made to refurbish fish attractors, continue the fertilization program, and continue stocking Florida largemouth bass, saugeye, channel catfish growouts and smallmouth bass. Night electrofishing should be conducted in fall 1994 to evaluate smallmouth bass and saugeye stocking success. Spring electrofishing should be conducted in 1995 to assess the fertilization program.

INTRODUCTION

Lake Burtschi impounds a tributary of the Little Washita River, 16 km southwest of Chickasha in Grady County, Oklahoma (Fig. 1). Constructed in 1954 by the ODWC, Lake Burtschi covers 72 surface hectares, has a mean depth of 3.6 m and a maximum of 9 m, a shoreline development ratio of 2.2, and a secchi disc visibility of around 60 cm in August; turbidity is primarily from plankton. Fish habitat consists of flooded willows and rip-rap on jetties and the dam.

Lake Burtschi was ringed with cattails prior to a lake drawdown in 1987. At that time, shallow areas along one-third of the shoreline were excavated and the material was used to build six fishing jetties. Prior to 1987, surveys indicated a bass population of low abundance but good balance.

Lake Burtschi is stocked annually with growout channel catfish. Saugeye were introduced in 1988, Florida bass have been stocked periodically since 1983, and reservoir-strain smallmouth bass were stocked in 1993 (Table 1). Burtschi was fertilized with 10-34-0 liquid in 1989-1992, and 28-0-0 in 1993. Many fish attractors have been built. The two boat ramps were extended in 1987 and a dock was placed near each. A 305mm minimum length limit on bass, in effect since 1978, was replaced with a 356mm limit in 1985.

A gillnet survey was conducted in 1992 to evaluate the catfish stocking program. Lake Burtschi was also sampled in 1992 and 1993 by spring electrofishing to evaluate the effects of the

fertilization program on sunfish, and by fall-night electrofishing in 1993 to assess the new saugeye fishery.

RESULTS

Largemouth Bass

1. Largemouth bass catch rates (C/f) from 1992 and 1993 spring electrofishing were 74 and 54, respectively. These C/fs were above the minimum acceptable value for a quality fishery (C/f=40). The total bass C/f has declined in recent sample years (Table 2).
2. In 1993 spring electrofishing, the abundance of bass in all size groups ≥ 200 mm was satisfactory, while C/fs < 200 mm were below acceptable values. The abundance of bass ≥ 356 mm has increased since 1990.
3. Body condition values (W_r) were satisfactory for all size groups in 1992 and 1993.
4. Results of electrophoretic testing indicate that, of the 1992 year class, 11% were pure Florida strain, 22% were F_1 hybrids, 6% were F_2 hybrids, and 61% were pure northern strain bass.
5. Abundance and body condition values for adult bass were generally acceptable at Lake Burtschi indicating a quality bass fishery. The bass abundance over 200mm was satisfactory, but recent recruitment has been poor. Another electrofishing survey should be taken in 1995 to monitor this problem. Electrophoretic results indicate that Florida bass stockings have made a significant contribution to the lake's trophy bass potential.

Smallmouth Bass

1. Smallmouth bass from the 1989 stocking were recaptured only during spring and fall electrofishing in 1990. Spring electrofishing in 1993 was conducted before additional smallmouth bass were stocked in 1993. Only one Age 0+ fish (126 mm) was captured during fall electrofishing.

Crappie [combined]

1. The crappie abundance from 1992 gill netting ($C/f=0.03$) was below the minimum acceptable value for a quality fishery (Table 4). The 1993 electrofishing C/f (10.0) was also low (Table 5).
2. The abundance of crappie in 1992 and 1993 electrofishing samples was below that of 1991. Crappie <130mm have not been found in the past three sample years.
3. With the exception of the few crappie ≥ 250 mm, body condition values (W_r) were unsatisfactory. Condition values for all size groups have declined since 1991.

White bass

1. White bass abundance from 1992 fall gillnetting ($C/f=0.10$) was below the minimum acceptable value for a quality fishery ($C/f= 0.20$ - Table 6).
2. The abundance of white bass <200mm was satisfactory, while C/fs from the 200-299mm and ≥ 300 mm size groups were below acceptable values.
3. Body condition values (W_r) were satisfactory for white bass <299mm, but those ≥ 300 were in poor condition.

Saugeye

1. Saugeye abundance from 1993 fall night electrofishing (C/f=150) was ten times the minimum acceptable value for a quality fishery (C/f= ≥ 15). The total saugeye C/f has increased in recent sample years (Table 7).
2. The abundance of saugeye <300mm was excellent, while those ≥ 300 mm were not captured. The abundance of saugeye ≥ 300 mm declined in 1993.
3. Body condition values (W_r) were satisfactory. Condition values have been stable in recent samples.
4. Saugeye were not stocked in 1990 or 1992; this resulted in the lack of large fish in the 1993 sample.

Channel Catfish

1. Channel catfish abundance from 1992 gillnetting (C/f=0.56) was almost three times above the minimum acceptable value for a quality fishery (C/f=0.20). The total channel catfish C/f increased in 1992 (Table 8).
2. The abundance of channel catfish in all size groups was satisfactory, with numerous large fish. The abundance of channel catfish in all size groups has increased since the last sample in 1982.
3. Body condition values (W_r) were satisfactory for channel catfish ≥ 300 mm, but those <300mm were in poor condition.
4. The growout stocking program at Lake Burtschi has apparently been successful.

Flathead Catfish

1. Flathead catfish were first gill netted at Burtschi in 1992 (C/f=0.06, Table 9).
2. Flathead catfish ≥ 300 mm were captured, but fish < 300 mm were not collected.
3. The gillnetted flathead catfish were in excellent condition.

Bluegill

1. Bluegill C/fs from 1992 and 1993 spring electrofishing were 286.0 and 188.0, respectively. Both were above the minimum acceptable value for a quality forage supply. The total bluegill C/f has declined in recent sample years (Table 10).
2. In 1993 spring electrofishing, the abundance of bluegill in the ≥ 150 mm size group was satisfactory, while those < 75 mm were below acceptable values. The intermediate bluegill (75-149mm) were overabundant, although their numbers have declined. Bluegill ≥ 150 mm in length increased in abundance.
3. Body condition values (W_r) were satisfactory for fish ≥ 150 mm, but those 75-149mm were in poor condition.
4. An increase in small bass numbers would reduce intermediate bluegill abundance and also reduce intraspecific competition. Hopefully, with continued fertilization, more of the overabundant intermediate bluegill will reach harvestable size.

Redear

1. One redeer was electrofished in both 1992 and 1993.

Gizzard Shad

1. Shad abundance from 1993 spring electrofishing (C/f=169.3)

was above the minimum acceptable value ($C/f = 40$). Shad abundance from 1992 fall gillnetting ($C/f = 0.90$) was also above the minimum acceptable value ($C/f = 0.20$). The total shad C/f for gillnetting and electrofishing has increased in recent sample years (Table 11).

2. In spring electrofishing and fall gillnetting, the abundance of shad <200 mm was above the acceptable value, indicating a satisfactory forage supply. The abundance of shad <200 mm has increased in recent electrofishing samples.
3. Relative weights (W_r) were fair for gillnetted shad, but the electrofished shad were in poor condition.
4. The overabundant shad probably compete with sunfish and small bass for food, and may have reduced the effectiveness of the fertilization program.

Rough Fish

1. Common carp were abundant in the 1992 gillnet sample.
2. Drum were moderately abundant in the gillnet sample.
3. One river carpsucker was also gill netted.

RECOMMENDATIONS

Habitat Enhancement

1. Liquid fertilizer (28-0-0) should be applied in 1994 to increase fish production. Hopefully, the switch from 10-34-0 to 28-0-0 will reduce blooms of bluegreen algae.

Fish Attractor Structures

1. All existing structures should be refurbished by 1995, since trees tend to decompose as they age in a lake.

Fish Stockings

1. Florida largemouth bass fingerlings should be stocked annually at 50/ha to maintain trophy bass potential.
2. Saugeye fingerlings should be stocked annually at 50/ha to diversify the sport fishery, reduce numbers of overabundant shad and small crappie, and utilize the abundant silversides population.
3. Channel catfish growouts should be stocked annually at 100/ha to maintain the excellent catfish fishery.
4. Smallmouth bass should be stocked at 25/ha in 1994 and 1995 to evaluate their potential at Lake Burtschi.

Fish Surveys

1. Night electrofishing should be conducted in fall 1994 to evaluate saugeye and smallmouth bass stocking success.
2. Spring electrofishing should be conducted in 1995 to monitor the effects of the fertilization program on the fish populations.

Fishing Regulations

1. The 356 mm minimum length limit on black bass should be retained to protect small bass which are low in abundance. This will allow more fish to reach a desirable size and provide control on overabundant shad and intermediate bluegill.
2. The limit of six channel catfish should also be retained to maintain the channel catfish fishery at a quality level.

Prepared by Paul Watkins

Paul Watkins
Fisheries Technician

Approved by Larry Cofer

Larry Cofer
Regional Supervisor

Approved by Barry Bolton

Barry D. Bolton
Assistant Chief, Management

LAKE BURTSCHI

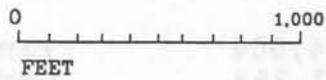
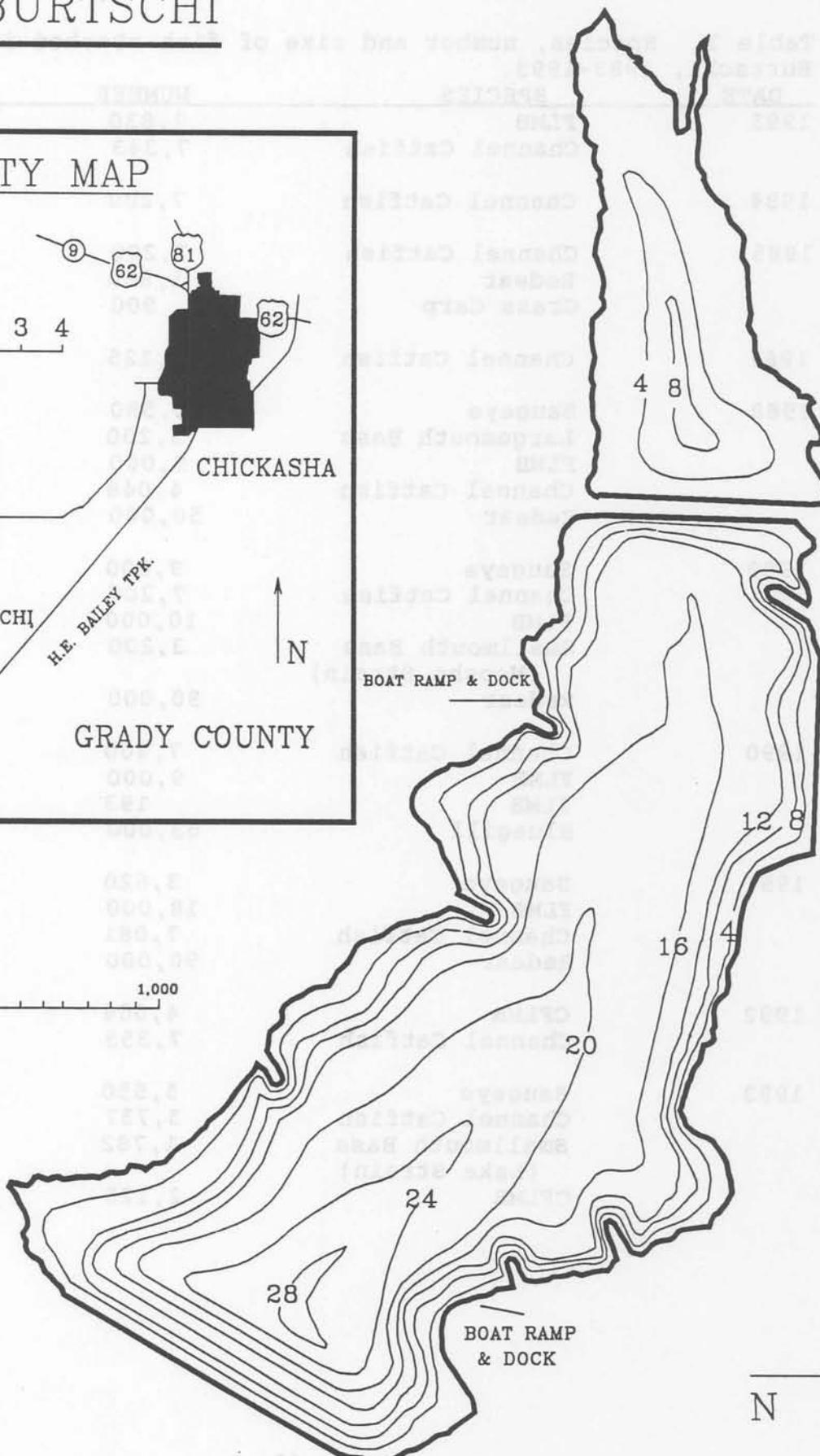
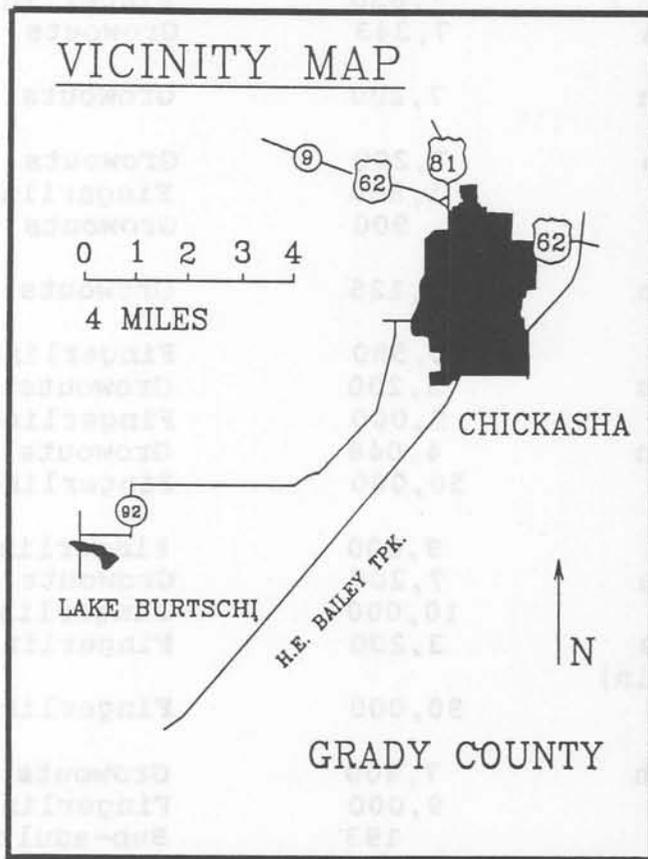


Table 1. Species, number and size of fish stocked in Lake Burtschi, 1983-1993.

DATE	SPECIES	NUMBER	SIZE
1983	FLMB	7,830	Fingerlings
	Channel Catfish	7,343	Growouts
1984	Channel Catfish	7,200	Growouts
1985	Channel Catfish	7,200	Growouts
	Redear	1,800	Fingerlings
	Grass Carp	900	Growouts
1987	Channel Catfish	2,125	Growouts
1988	Saugeye	5,580	Fingerlings
	Largemouth Bass	3,200	Growouts
	FLMB	9,000	Fingerlings
	Channel Catfish	4,048	Growouts
	Redear	50,000	Fingerlings
1989	Saugeye	9,000	Fingerlings
	Channel Catfish	7,200	Growouts
	FLMB	10,000	Fingerlings
	Smallmouth Bass (Neosho Strain)	3,200	Fingerlings
	Redear	90,000	Fingerlings
1990	Channel Catfish	7,400	Growouts
	FLMB	9,000	Fingerlings
	FLMB	193	Sub-adults
	Bluegill	63,000	Fingerlings
1991	Saugeye	3,620	Fingerlings
	FLMB	18,000	Fingerlings
	Channel Catfish	7,081	Growouts
	Redear	90,000	Fingerlings
1992	CFLMB	4,004	Fingerlings
	Channel Catfish	7,353	Growouts
1993	Saugeye	5,550	Fingerlings
	Channel Catfish	3,737	Growouts
	Smallmouth Bass (Lake Strain)	1,782	Fingerlings
	CFLMB	2,125	Fingerlings

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 Lake Burtschi. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total (≥ 40)		<200 mm (15-45)		200-299 mm (15-30)		≥ 300 mm (≥ 15)		≥ 356 mm (≥ 10)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1990	131	37.4	25.4	92	8.6	93	3.4	97	2.0	103
1991	134	107.2	28.0	93	38.4	95	40.8	97	4.8	98
1992	111	74	6.7	95	46.7	90	20.7	101	12.0	100
1993	108	54	6.0	102	15.0	94	33.0	96	15.0	102

Table 3. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of smallmouth bass collected by spring electrofishing from Lake Burtschi. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total (≥ 40)		<200 mm (15-45)		200-299 mm (15-30)		≥ 300 mm (≥ 15)		≥ 356 mm (≥ 10)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1989*										
1990	3	0.9	0.9	-						
1991	0	0								
1992	0	0								
1993	0	0								

*Smallmouth bass were introduced in 1989. They were restocked in June 1993 after spring electrofishing was conducted.

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

Year	Total ($\geq .20$)		<200 mm (.05-.30)		≥ 200 mm ($\geq .08$)		≥ 250 mm ($\geq .04$)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1977	38	0.31						
1978	13	0.12						
1980	13	0.11						
1982	4	0.04						
1992	3	0.03	0	-	3	108	0	-

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

Year	Total		<130 mm		≥ 130 mm		≥ 200 mm		≥ 250 mm	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1990	26	7.4	0.9	-	6.6	125	4.6	119	1.1	112
1991	28	22.4	0	-	22.4	144	21.6	145	17.2	132
1992	13	8.7	0	-	8.7	89	7.3	89	5.3	91
1993	20	10.0	0	-	10.0	88	9.0	88	1.5	100

Table 6. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of white bass collected by gill netting from Lake Burtschi. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total (≥ 20)		<200 mm (≥ 0.05)		200-299 mm (.05-.30)		≥ 300 mm (≥ 1.0)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1977	0	-						
1978	0	-						
1980	0	-						
1982	9	0.09						
1992	9	0.10	0.07	94	0.01	93	0.01	79

Table 7. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of saugeye collected by night electrofishing from Lake Burtschi. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total (≥ 15)		<300 mm (≥ 10)		300-399 mm (≥ 3)		≥ 400 mm (≥ 2)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1988*								
1989	55	44.0	30.4	-	13.6	-	2.4	-
1990	16	12.8	0	-	4.0	95	8.8	103
1991	25	14.3	5.7	110	0	-	8.6	103
1993	75	150.0	150.0	94	0	-	0	-

*Saugeye were first stocked in 1988. Saugeye were not stocked in 1990 or 1992.

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

Year	Total (≥ 20)		<300 mm (≥ 10)		≥ 300 mm (≥ 10)		≥ 400 mm (≥ 05)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1977	60	0.49						
1978	15	0.14						
1980	34	0.28						
1982	28	0.28	0.05	-	0.22	-	0.10	-
1992	53	0.56	0.22	87	0.34	92	0.18	97

Table 9. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of flathead catfish collected by gill netting from Lake Burtschi. Acceptable W_r values are ≥ 90 .

Year	No.	Total		<300 mm		≥ 300 mm		≥ 500 mm		≥ 600 mm		≥ 700 mm	
		C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r	C/f	W_r
1977	0	-											
1978	0	-											
1980	0	-											
1982	0	-											
1992	6	0.06	0	-	0.06	125	0.06	125	0.05	133	0.03	128	

Table 10. Total number (No.), catch rates (C/f), and relative weights (W_r) by size groups of bluegill collected by spring electrofishing from Lake Burtschi. Numbers in parentheses represent acceptable C/f values for a quality fishery. Acceptable W_r values are ≥ 90 .

Year	Total (≥ 45)		<75 mm (≥ 10)		75-149 mm (20-100)		≥ 150 mm (≥ 15)	
	No.	C/f	C/f	W_r	C/f	W_r	C/f	W_r
1990	91	45.5	2.0	68.0	24.5	102	19.5	103
1991	108	216.0	6.0	-	142.0	99	102	
1992	143	286.0	22	-	228.0	88	36.0	94
1993	141	188.0	0	-	122.7	89	65.3	95

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

Year	Spring Electrofishing				Fall Gillnetting				Seining	
	Total (≥ 40)	<200 mm (≥ 20)		W_r	Total (≥ 20)	W_r	<200 mm (≥ 10)	W_r	No.	C/f
1977					1.34	165				
1978					1.00	110				
1980					0.63	76				
1982					0.84	84				
1990	121	60.5	23.5	80						
1991	38	76.0	0	-						
1992	113	113.0	21.0	97	0.90	85	0.40	91		
1993	127	169.3	82.6	82						

Table 12. Total number (No.) and catch rates (C/f) of non-game fish collected by gill netting from Lake Burtschi.

Year	CRP ¹		DRM ¹		RCS ¹		BBH ¹		SBF ¹		Total	
	No.	C/f	No.	C/f								
1977	12	0.10	0	-	0	-	6	0.05	3	0.02	21	0.17
1978	8	0.07			1	Tr	5	0.04	0	-	14	0.11
1980	8	0.07	0	-	0	-	4	0.03	0	-	12	0.10
1982	17	0.17	0	-	4	0.04	11	0.11	0	-	32	0.32
1992	37	0.39	9	0.10	1	0.01					47	0.50

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.