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EVALUATION OF A SUPPLEMENTAL BLACK CRAPPIE STOCKING PROGRAM AT LAUREL RIVER LAKE, KENTUCKY

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Abstract

We evaluated the success of supplemental stockings of blacknose crappie in Laurel River Lake. Blacknose crappie were stocked from 2002-2006 at rates of 4.7-14.6 fish/acre. Thirty-one trap net-nights yielded one blacknose crappie, and 11 hours of electrofishing produced 14 blacknose crappie. Creel surveys conducted in 2003 and 2006 show an increase in catch and harvest rates for crappie when compared to creel surveys conducted during the 1990s. Angler attitude surveys indicated that crappie angler satisfaction had increased from 34% in 2003 to 73% in 2006. Eighty-eight percent of crappie anglers in 2006 felt that crappie fishing had somewhat improved since 2003. Results of the creel surveys in 2003 and 2006 indicate that crappie stocking in Laurel River Lake may be marginally effective, but the increases were not significant to warrant the continuation of the stocking program.

Introduction

Crappie *Pomoxis sp.* are a popular sportfish in Kentucky. According to a 2001 survey, crappie were the second most sought after fish species in Kentucky, following black bass (USDI 2003). Both white crappie *P. annularis* and black crappie *P. nigromaculatus* were historically an important component of the fishery in Laurel River Lake. Creel surveys conducted from 1975 to 1977 showed that crappie accounted for 48 to 73% of the total numbers of fish caught and 25 to 61% of the total weight of all harvested fish (Jones 1976, 1977, 1978). The number of crappie harvested ranged from 6.8 to 29.0 fish/acre, and the weight of crappie harvested ranged from 0.8 to 6.8 lb/acre during the 1970's surveys. Cove rotenone studies indicated that crappie standing crop peaked in 1976 at 150 lb/ac (Jones 1977). Although crappie populations comprised nearly 66% of the standing stock in 1976, crappie populations in the lake declined over time and comprised less than 1% of the population by the mid 1980's.

Creel surveys conducted in 1993 and 1997 continued to document the reduction in the crappie population at Laurel River Lake. In the 1993 and 1997 surveys, crappie comprised 4 and 12%, respectively, of the total number of fish harvested and 3 and 5% of the total weight harvested (Stephens 1994, 1998). Anglers also expressed dissatisfaction with the crappie fishing at Laurel River Lake in the 1993 angler attitude survey with only 26% of the respondents satisfied with the crappie fishing (168 total responses). Lack of fish was the top response as to why they were dissatisfied (Stephens 1994).

Inconsistencies in crappie populations have been documented and are often the result of recruitment variability within a system (Colvin and Vasey 1986; Guy and Willis 1995). Crappie stocking programs have been used in several states to enhance year-class production (Pitman and Gutreuter 1993; Isermann et al. 2002; Racey and Lochman 2002), although year-class contributions of stocked crappie have varied. With the significant decline in the crappie population in Laurel River Lake, the decision was made to stock blacknose crappie, a morphological variant of the black crappie that is characterized by a black predorsal stripe, to supplement the crappie population. This report will evaluate the supplemental blacknose crappie stockings at Laurel River Lake from 2002-2006.

Description of study area

Laurel River Lake, a 6,060-acre U. S Army Corps of Engineers reservoir located in Laurel and Whitley counties in southeastern Kentucky, was impounded with the completion of Laurel Dam (located at Laurel River mile 2.8) in 1974. The primary authorization for the impoundment of Laurel River Lake was to provide hydroelectric production, drinking water supply, and recreation. There is one generator and water elevations between 1,018-982 msl are allocated for power production, which results in annual water level fluctuations averaging 15 ft. Laurel River Lake is 19.2 miles long, has an average depth of 72 ft, a shoreline length of approximately 206 miles, and a hydraulic retention time of 1.3 years.

Laurel River Lake, a warm, monomictic lake which stratifies between May and November, usually has a well-oxygenated hypolimnion. The trophic state of the lake has been described by

the Kentucky Division of Water (1984) as being oligotrophic over much of its length, with the exception of 1,070 acres of the midlake (754 acres) and headwaters (316 acres) of the Laurel River arm, which are classified as mesotrophic and eutrophic, respectively. The watershed is 282 square miles and is comprised mostly of publicly owned forested land (71%) and some agricultural land (26%).

Materials and methods

Trap netting was conducted in 2003 and 2005. Trap nets were constructed of two 5/16 in steel frames measuring 3 X 6 ft, four ¼ in steel hoops that were 2.5 ft in diameter, 0.5 in (square) knotless nylon netting, and a single lead of 3.5 X 70 ft. Trap nets were set at standard locations in the Laurel River arm (312 Bridge area) in late October and early November. Nets were fished overnight for approximately 24 hours. Crappie species were identified, measured to the nearest 0.1 inch, weighed to the nearest 0.01 lb, and otoliths were removed for subsequent age-growth analysis.

Boat electrofishing was conducted from 2003-2006 in the upper (312 Bridge), middle (Hightop), and lower (Holly Bay) sections of the lake. Electrofishing was performed in spring (April) and late fall (November and December) during daylight hours using 15-minute runs. Crappie species were identified, measured to the nearest 0.1 inch, weighed to the nearest 0.01 lb, and otoliths were removed for age-growth analysis.

Otoliths were cleaned and viewed whole using a dissecting microscope. Ages were determined and annuli and edge measurements were recorded. Growth rates were determined for each crappie species using Kentucky Fisheries Analysis System (KFAS) programs (SAS).

Creel surveys and angler attitude surveys were conducted in 2003 and 2006 to collect data on the crappie fishery. A roving daytime creel survey was conducted from 9 April to 31 October 2003 and 16 March to 31 October 2006. The lake was stratified into two equal probability survey areas: upper lake (Whipporwill Creek upstream to the 312 Bridge area) and lower lake (mouth of Whipporwhill Creek to the main dam and the Craigs Creek arm). The survey was conducted for 16 days per month in March, April, September, and October. The sampling frequency was reduced to 12 days in May and 8 days in June, July, and August to incorporate a nighttime survey into the creel schedule. The lake was surveyed for six hours based on two equal probability sample periods (morning and afternoon).

An access point nighttime creel survey was conducted from 15 May to 29 August 2003 and 16 May to 30 August 2006. The lake was surveyed two nights per week (1 weekday night and 1 weekend night) from 10:00 pm to 3:00 am at one of three equal probability access sites (Flatwoods, Holly Bay, and Grove) in 2003 and one of four non-uniform probability access sites (Flatwoods-0.4, Holly Bay-0.2, Grove-0.2, and Marsh Branch-0.2) in 2006. Fishing pressure counts were determined by the following method. The creel clerk counted the number of boat trailers in the parking lot at 10:00 pm and again at 3:00 am and then averaged the two numbers. During the interview process, the clerk recorded the number of anglers in each boat and calculated an average number of anglers per boat. The final count was determined by multiplying the average boat trailer count X average number of anglers per boat. These daily

pressure counts were expanded by the appropriate probabilities to determine monthly catch and harvest rates.

Results

Blacknose crappie were stocked in Laurel River Lake from 2002-2006 (Table 1). Stocking of 2.5-4.1 in fingerling blacknose crappie occurred during the fall of each year at rates ranging from 4.7-14.6 fish/acre.

Trap netting for crappie yielded 1 blacknose crappie in 2003 and no blacknose crappie in 2005 (Table 2). White crappie were the dominant crappie species collected during fall trap netting in both years.

Electrofishing also produced very few blacknose crappie. The Laurel River arm (312 Bridge) had the highest catch rates of blacknose crappie of any of the areas sampled (Table 3).

Growth rates for blacknose crappie (Table 4) were similar to growth rates for black crappie (Table 5) in Laurel River Lake as both averaged over 9.0 in at age 3. Growth rates for white crappie are shown in Table 6 and appear to be slower than either black or blacknose crappie as white crappie averaged only 7.7 in at age 3.

In the 2003 daytime creel survey, crappie accounted for 20% of all fish harvested and 10% of the total weight harvested (Table 7). The number of crappie caught in 2003 was 1.19 fish/acre and 0.14 lb/acre. In 2006, crappie species accounted for 22% of all fish harvested and 12% of the total weight harvested. The number of crappie caught in 2006 was 1.54 fish/acre and 0.33 lb/acre. Black crappie comprised the majority of the crappie species caught in both the 2003 and 2006 creel surveys (Figure 1). In the 2006 creel survey, blacknose crappie contributed 17% to the overall crappie catch and approximately 6% of the crappie harvest (Table 7). Monthly angling success for crappie at Laurel River Lake showed that the number of crappie caught per hour by crappie anglers had doubled in 2006 compared to the 2003 survey (Table 8). Size distribution of crappie caught during the daytime creel revealed that larger black crappie were caught in 2006 than in 2003, and few blacknose crappie attained harvestable size (Table 9).

During the nighttime creel surveys on Laurel River Lake, crappie species comprised a small percentage of the overall fishery; however, catch rates of crappie had increased from 0.08 fish per acre in 2003 to 0.28 fish per acre in 2006 (Table 10). In addition, crappie catch and harvest rates by crappie anglers had increased substantially between 2003 and 2006 (Table 11). Crappie observed during the nighttime creel were larger in size in the 2006 creel survey than those observed in the 2003 survey (Table 12).

Creel survey results in 2003 and 2006 indicate that the crappie fishery had improved from the 1993 and 1997 creel surveys at Laurel River Lake (Table 13). In the 2003 and 2006 surveys, the number of crappie caught per acre had more than tripled and the number of crappie harvested per acre had doubled from the rates observed in the 1990's. Although catch and harvest rates improved between 1997 and 2003 and crappie species composition shifted to a population dominated by black crappie (Table 13, Figure 1), blacknose crappie were not recorded in the

2003 creel. Based on limited growth information, blacknose crappie in Laurel River Lake would have averaged between 5.0-6.0 in during the fall of 2003. Black crappie as small as 4.0 in were observed in the creel survey in 2003, which could indicate that blacknose crappie could have been caught but reported by anglers as black crappie.

In the 2003 angler attitude survey, out of 513 responses, 26% fished for crappie and 11% listed crappie as the species they fished for most (Figure 2). In 2003, only 34% of the crappie anglers were satisfied with the crappie fishing at Laurel River Lake (n=90). In 2006, of the 362 anglers surveyed, 14% said they fished for crappie and 4% listed crappie as the species they fished for most (Figure 3). In the 2006 angler attitude, 73% of the crappie anglers were satisfied with the crappie fishing (n=49). In addition, 88% of the crappie anglers in 2006 felt that crappie fishing at Laurel River Lake had improved somewhat since 2003.

Discussion

Blacknose crappie sampling efforts at Laurel River Lake were largely unsuccessful due to the physical attributes of Laurel River Lake (i.e. steep banks and deep water) that provided limited suitable areas for trap netting. In addition, electrofishing efforts may have been biased towards white crappie because the best areas for crappie electrofishing (turbid water and tree cover) were in the upper Laurel River arm. Clearer water in the lower-lake areas may support blacknose crappie; however, crappie in lower-lake areas are either too deep to be captured by electrofishing or are in areas that are inaccessible by boat (thick, standing-timbered coves).

In addition to the blacknose crappie stockings in Laurel River Lake from 2002-2006, approximately 26,000 non-marked black crappie were stocked during 2001. Based on the length-frequency of black crappie observed in the creel survey and limited age-growth data for black crappie in Laurel River Lake, it appears that the stocked black crappie may have contributed to the increase in crappie catch rates observed during the 2003 creel survey. This additional black crappie stocking just prior to the start of the blacknose crappie stocking program may confound the ability to determine the success of stocked blacknose crappie.

In order to protect the stocked blacknose crappie, a 9-in minimum size limit and a reduction in the daily creel limit from 30 fish to 15 fish was instituted in March 2004 on Laurel River Lake. Anglers in previous creel surveys on Laurel River Lake would keep crappie as small as 5.0 in, and over 90% of the black crappie 7.0 in and larger were harvested. If the 9-in minimum size limit was not in effect and crappie were harvested at rates that were consistent with previous creel surveys, approximately 8,600 crappie (1.42 fish/acre) would have been harvested in 2006, which represents a four-fold increase over harvest rates observed in the 1990's and nearly double the rate observed in 2003.

Success of blacknose crappie stocking programs can be highly variable. In Laurel River Lake, blacknose crappie represented approximately 6% of all harvested crappie during the 2006 creel survey. These results were similar to rates observed in Cherokee Reservoir in Tennessee, where blacknose crappie represented no more than 12% of all harvested crappie during creel surveys (Isermann et al. 2002). However, the same study by Isermann et al. (2002) showed that blacknose crappie made up between 60-95% of all crappie harvested during creel surveys at

Center Hill Reservoir. In Illinois, stocked crappie composed 32% of the overall crappie caught by anglers (Lewis et al. 1963).

Year class contributions of stocked crappie can be inconsistent. Year-class contributions of blacknose crappie stocked in several reservoirs in Tennessee ranged from 0 to 93% (Sammons et al. 2000; Isermann et al. 2002). Blacknose crappie stockings in Cherokee Reservoir and Lake Graham were considered failures when stocked crappie comprised less than 6% and 0%, respectively, of all crappie in fall trap net samples (Sammons et al. 2000; Isermann et al. 2002). In Woods Reservoir, stocked crappie represented 11-24% of the year class and was considered marginally successful. Stockings in Normandy Reservoir were considered successful when stocked crappie contributed 34-93% to the year class (Isermann et al. 2002). Crappie stocking efforts in other states have shown little success. Black crappie stocked in Lake Jeffords, Florida, composed approximately 5% of the year class 10 months after stocking (Myers et al. 2000); however, high initial post-stocking mortality may have reduced stocking contributions. In Lake Chicot, Arkansas, stocked white crappie only contributed 0-3% to the year class (Racey and Lochmann 2002).

Several variables can influence the success of stocking programs. Predation on recently stocked fish can increase initial post-stocking mortality. Sammons et al. 2000 observed recently stocked blacknose crappie in 14-42% of predator stomachs that contained food. In Woods Reservoir, Lake Graham, and Cherokee Reservoir, where stocking of crappie were largely unsuccessful, predator densities were high; whereas, in Normandy Reservoir, crappie stockings were successful, and predator catch rates were low (Sammons et al. 2000). In Laurel River Lake, predator densities are high, which may have impacted the survival of stocked crappie. In addition, natural year-class strength may impact the success of stocked fish. Heidinger and Brooks (1998) observed low success rates for stocked sauger when natural recruitment was high in the Illinois River. Lewis et al. (1963) suggested stocked crappie contributed a higher percentage to the angler catch than other stocked species because natural crappie population abundance was low.

Conclusions

Although sampling efforts revealed little about the success of the blacknose crappie stocking in Laurel River Lake, creel surveys and angler attitude surveys indicate that crappie fishing has improved in the lake since the 1990's. Without the changes in the harvest regulations in 2004, it is likely that harvest rates in 2006 would have been higher than rates observed in previous creel surveys. The additional stocking of black crappie in 2001 may be confounding the results of this study but indicates that crappie stocking in Laurel River Lake may be marginally effective. The improvements in the crappie fishery observed in 2003 and 2006 were likely the result of the crappie stocking program and changes in the harvest regulations, but the improvements were not significant enough to warrant the continuation of the stocking program.

Management Recommendations

Because trap netting and electrofishing for crappie at Laurel River Lake is ineffective; we recommend that creel surveys be used to monitor the crappie population in future years.

Additionally, age-growth data should be collected from angler-caught crappie during creel survey years to monitor growth rates. Long-term stocking of crappie in Laurel River Lake does not appear to be a viable management option that will result in significant increases in angler catch and harvest. We recommend that because we documented limited success of these stockings, that stocking of crappie in Laurel River Lake be discontinued.

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Table 1. Blacknose crappie stockings in Laurel River Lake from 2002 to 2006.

Stocking Date	Number Stocked	Number/acre	Length (in)
Nov-02	65,345	10.8	2.5
Nov-03	88,443	14.6	2.5
Nov-04	55,405	9.1	3.0
Nov-05	74,676	12.3	2.5
Oct-06	28,289	4.7	4.1

Table 2. Length frequency and CPUE (number/net night) for each species of crappie collected during fall trap netting in Laurel River Lake during 2003 (19 net-nights) and 2005 (12 net-nights).

		Inch class										
Year	Species	3	4	5	6	7	8	9	10	11	Total	CPUE (St.err)
2003	White crappie	3	5	13	17	8	1	1	1		49	2.58 (0.65)
	Black crappie	1		3				1			5	0.26 (0.18)
	Blacknose crappie				1						1	0.05 (0.05)
2005	White crappie							2		1	3	0.25

Table 3. Length frequency and CPUE (number/hour) for each species of crappie collected during electrofishing in Laurel River Lake from 2004-2006.

			Inch class											
Date	Location	Species	3	4	5	6	7	8	9	10	11	Total	Effort (hours)	CPUE (St.err)
4/1/2004	312 Bridge													
		White crappie					1	1		1	1	4	1.00	4.0 (1.63)
		Black crappie									2	2		2.0 (1.15)
4/6/2004	Hightop													
		Black crappie								1			1.00	1.0 (1.0)
11/5/2004	312 Bridge													
		White crappie	1	3	1	2	2	2	6	2		19	1.50	12.7 (6.06)
		Black crappie							1			1	1.50	0.7 (0.67)
4/19/2005	312 Bridge													
		White crappie					1	7	1	2		11	1.50	7.3 (5.88)
		Black crappie							2			2	1.50	1.3 (0.84)
		Blacknose crappie							1			1	1.50	0.7 (0.67)
11/10/2005	312 Bridge													
		White crappie						1				1	1.50	0.7 (0.67)
		Blacknose crappie			3	3	5	1				12	1.50	8.0 (4.00)
11/18/2005	Holly Bay													
		No crappie collected										0	0.75	0
12/13/2005	Hightop													
		Black crappie						1				1	1.50	0.7 (0.67)
12/18/2006	312 Bridge													
		Blacknose crappie	1									1	2.25	0.44 (0.44)

Table 4. Mean back calculated lengths (in) at each annulus for blacknose crappie collected from Laurel River Lake from 2003-2005, including the 95% confidence interval (CI) for each mean length per age group.

		Age		
Year	No.	1	2	3
2004	12	3.5		
2002	2	3.6	6.3	9.8
Mean		3.5	6.3	9.8
Number		14	2	2
Smallest		2.9	6.3	9.8
Largest		4.2	6.3	9.8
Std error		0.1		
95%CI ±		0.2		

Table 5. Mean back calculated lengths (in) at each annulus for black crappie collected from Laurel River Lake from 2003-2005, including the 95% confidence interval (CI) for each mean length per age group.

		Age		
Year	No.	1	2	3
2004	1	4.8		
2002	6	3.9	6.0	9.5
2001	1	4.3	7.7	
Mean		4.1	6.5	9.5
Number		8	7	1
Smallest		3.0	5.7	9.0
Largest		5.2	7.7	9.9
Std error		0.3	0.5	0.5
95%CI ±		0.6	1.0	0.9

Table 6. Mean back calculated lengths (in) at each annulus for white crappie collected from Laurel River Lake from 2003-2005, including the 95% confidence interval (CI) for each mean length per age group.

		Age				
Year	No.	1	2	3	4	5
2003	4	4.1	7.8			
2002	40	4.1	5.7	8.7		
2001	25	3.9	6.4	7.9	9.0	
1999	3	3.3	5.3	6.1	6.9	
1998	1	3.3	4.1	5.2	5.8	6.4
Mean		4.0	6.1	7.7	7.8	6.4
Number		73	73	69	29	1
Smallest		2.4	4.1	5.2	5.8	6.4
Largest		6.6	8.0	9.7	10.3	6.4
Std error		0.1	0.1	0.3	0.6	
95%CI ±		0.2	0.3	0.6	1.1	

Table 7. Crappie harvest statistics derived from daytime creel surveys at Laurel River Lake (6,060 acres) from 9 April-31 October 2003 and 16 March - 31 October 2006.

	Year							
	2003			2006 [A]				
	Crappie group	Black crappie	White crappie	Crappie group	Black crappie	Blacknose crappie	White crappie	Illegal bl. crappie
No. caught	7,189	5,370	1,819	9,343	7,031	1,634	678	28
(per acre)	1.19	0.89	0.30	1.54	1.16	0.27	0.11	t
No. harvested	4,483	3,796	687	3,702	3,358	209	135	28
(per acre)	0.74	0.63	0.11	0.61	0.55	0.03	0.02	t
% of total no. harvested	20.3	17.2	3.1	21.5	19.5	1.2	0.8	t
Lbs. harvested	861	760	101	2,027	1,903	78	46	6
(per acre)	0.14	0.13	0.02	0.33	0.31	0.01	0.01	t
% of total lbs harvested	10.2	9.0	1.2	11.9	11.1	0.5	t	
Mean length (in)		8.2	6.9		10.3	9.0	9.2	8.0
Mean weight (lb)		0.30	0.14		0.58	0.37	0.34	0.21
Number of fishing trips for that species	1,317			1,492				
Percent of all trips	8.3			9.9				
Hours fished for that species	6,784			5,634				
Hours fished for that species (per acre)	1.12			0.93				
Number harvested fishing for that species	4,327			3,427				
Lb harvested fishing for that species	805			1,918				
No./hr harvested fishing for that species	0.53			0.72				
Percent success fishing for that species	43.4			46.7				

[A] 9-in minimum length limit and 15 fish daily creel limit in effect
t < 0.005 fish/hr or < 0.5%

Table 8. Monthly crappie angling success at Laurel River Lake (6,060 acres) during the 2003 and 2006 daytime creel survey period.

Year	Month	Total no. of crappie caught	Total no. of crappie harvested	Number of crappie fishing trips	Hours fished by crappie anglers	Crappie caught by crappie anglers	Crappie caught/hour by crappie anglers	Crappie harvested by crappie anglers	Crappie harvested/hour by crappie anglers
2003									
	Apr	1,006	298	324	1,670	1,006	0.68	298	0.20
	May	325	209	180	929	256	0.25	140	0.14
	Jun	1,406	322	245	1,260	1,319	0.74	235	0.13
	Jul	0	0	0	0	0		0	
	Aug	1,328	1,328	193	992	1,328	1.34	1,328	1.34
	Sep	1,808	1,292	179	923	1,757	1.47	1,292	1.08
	Oct	1,316	1,034	196	1,010	1,254	1.10	1,034	0.91
	Total	7,189	4,483	1,317	6,784	6,920		4,327	
	Mean						0.88		0.53
2006									
	Mar	3,100	797	175	662	3,030	3.84	797	1.01
	Apr	1,352	386	343	1,293	1,159	1.58	276	0.38
	May	913	479	197	745	844	1.82	434	0.94
	Jun	1,128	639	237	896	1,015	2.16	564	1.20
	Jul	133	66	13	51	99	1.07	66	0.71
	Aug	36	0						
	Sep	922	571	164	618	879	1.31	527	0.78
	Oct	1,760	763	363	1,369	1,738	1.14	763	0.50
	Total	9,344	3,701	1,492	5,634	8,764		3,427	
	Mean						1.98		0.72

Table 9. Length distribution for each species of crappie harvested and released at Laurel River Lake (6,060 acres) during daytime creel surveys from 9 April-31 October 2003 and 16 March - 31 October 2006.

		Inch class													
Year	Species	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2003															
	Black crappie														
	Harvested			553	980	804	603	302	327	101	75	51			
	Released		377	821	177	89	22		67		22				
	White Crappie														
	Harvested			79	185	212	53	158							
	Released	96	72	650	217	48	48								
2006 [A]															
	Black crappie														
	Harvested							1201	1250	294	319	172	74	48	
	Released				112	898	2267	110	132		66	22	22	22	22
	Blacknose crappie														
	Harvested							209							
	Released					222	1134	69							
	White crappie														
	Harvested							113	22						
	Released				37	243	263								

[A] 9-in minimum length limit and 15 fish daily creel limit in effect

Table 10. Crappie harvest statistics derived from nighttime creel surveys at Laurel River Lake (6,060 acres) from 15 May-29 August 2003 and 13 May - 30 August 2006.

	Year						
	2003			2006 [A]			
	Crappie group	Black crappie	White crappie	Crappie group	Black crappie	Blacknose crappie	White crappie
No. caught	456	217	238	1,711	1,569	95	47
(per acre)	0.08	0.04	0.04	0.28	0.26	0.02	0.01
No. harvested	294	66	228	785	738	47	0
(per acre)	0.05	0.01	0.04	0.13	0.12	0.01	0.00
% of total no. harvested	8.7	2.0	6.7	9.5	8.9	0.6	0.0
Lbs. harvested	95	32	63	431	407	25	0
(per acre)	0.02	0.01	0.01	0.07	0.07	0.00	0.00
% of total lbs harvested	3.8	1.3	2.5	3.3	3.1	0.2	0.0
Mean length (in)		9.5	8.5		10.2	10.0	
Mean weight (lb)		0.47	0.26		0.57	0.53	
Number of fishing trips for that species	375			141			
Percent of all trips	4.5			1.2			
Hours fished for that species	1,887			635			
Hours fished for that species (per acre)	0.31			0.10			
Number harvested fishing for that species	294			785			
Lb harvested fishing for that species	96			432			
No./hr harvested fishing for that species	0.14			1.00			
Percent success fishing for that species	40.0			100.0			

[A] 9-in minimum length limit and 15 fish daily creel limit in effect

Table 11. Monthly crappie angling success at night at Laurel River Lake (6,060 acres) during the 2003 and 2006 creel survey periods.

Year	Month	Total no. of crappie caught	Total no. of crappie harvested	Number of crappie fishing trips	Hours fished by crappie anglers	Crappie caught by crappie anglers	Crappie caught/hour by crappie anglers	Crappie harvested by crappie anglers	Crappie harvested/hour by crappie anglers
2003	May	211	105	202	1,014	210	0.25	105	0.13
	Jun	32	21	64	321	21	0.06	21	0.06
	Jul	191	167	90	451	168	0.33	168	0.33
	Aug	22	0	20	101	22	0.25	0	0
	Total	456	293	376	1,887	421		294	
	Mean						0.21		0.14
2006	May	1,074	561	98	441	1,028	2.44	561	1.33
	Jun	539	224	43	194	470	1.62	224	0.77
	Jul	47	0	0					
	Aug	51	0	0					
	Total	1,711	785	141	635	1,498		785	
	Mean						1.96		1.00

Table 12. Length distribution for each species of crappie harvested and released at Laurel River Lake (6,060 acres) during the nighttime creel surveys from 15 May - 29 August 2003 and 16 May - 30 August 2006.

		Inch class								
		6	7	8	9	10	11	12	13	14
Year	Species									
2003	Black crappie									
	Harvested			17	17	17	15			
	Released	94	38			19				
	White crappie									
	Harvested		46	91	46	23		22		
	Released		11							
2006 [A]	Black crappie									
	Harvested				316	246	35	35	70	36
	Released									
	Blacknose crappie									
	Harvested		22		26	47				
	Released									
	White crappie									
	Harvested									
	Released			47						

[A] 9-in minimum length limit and 15 fish daily creel limit in effect

Table 13. Crappie (all species combined) harvest statistics derived from a daytime creel survey at Laurel River Lake (6,060 acres) in 1993, 1997, 2003, and 2006.

	Year			
	1993	1997	2003	2006 [A]
No. caught	2,271	1,852	7,189	9,343
(per acre)	0.37	0.31	1.19	1.54
No. harvested	1,974	1,722	4,483	3,702
(per acre)	0.33	0.28	0.74	0.61
% of total no. harvested	4.4	12.3	20.3	21.5
Lbs. harvested	628	504	861	2,027
(per acre)	0.10	0.08	0.14	0.33
% of total lbs harvested	3.3	4.8	10.2	11.9
Number of fishing trips for that species	1,015	884	1,317	1,492
Percent of all trips	3.7	4.1	8.3	9.9
Hours fished for that species	5,899	4,717	6,784	5,634
Hours fished for that species (per acre)	0.97	0.78	1.12	0.93
Number harvested fishing for that species	1,735	1,722	4,327	3,427
Lb harvested fishing for that species	531	504	805	1,918
No./hr harvested fishing for that species	0.32	0.47	0.53	0.72
Percent success fishing for that species	36.7	38.5	43.4	46.7

[A] 9-in minimum length limit and 15 fish daily creel limit in effect

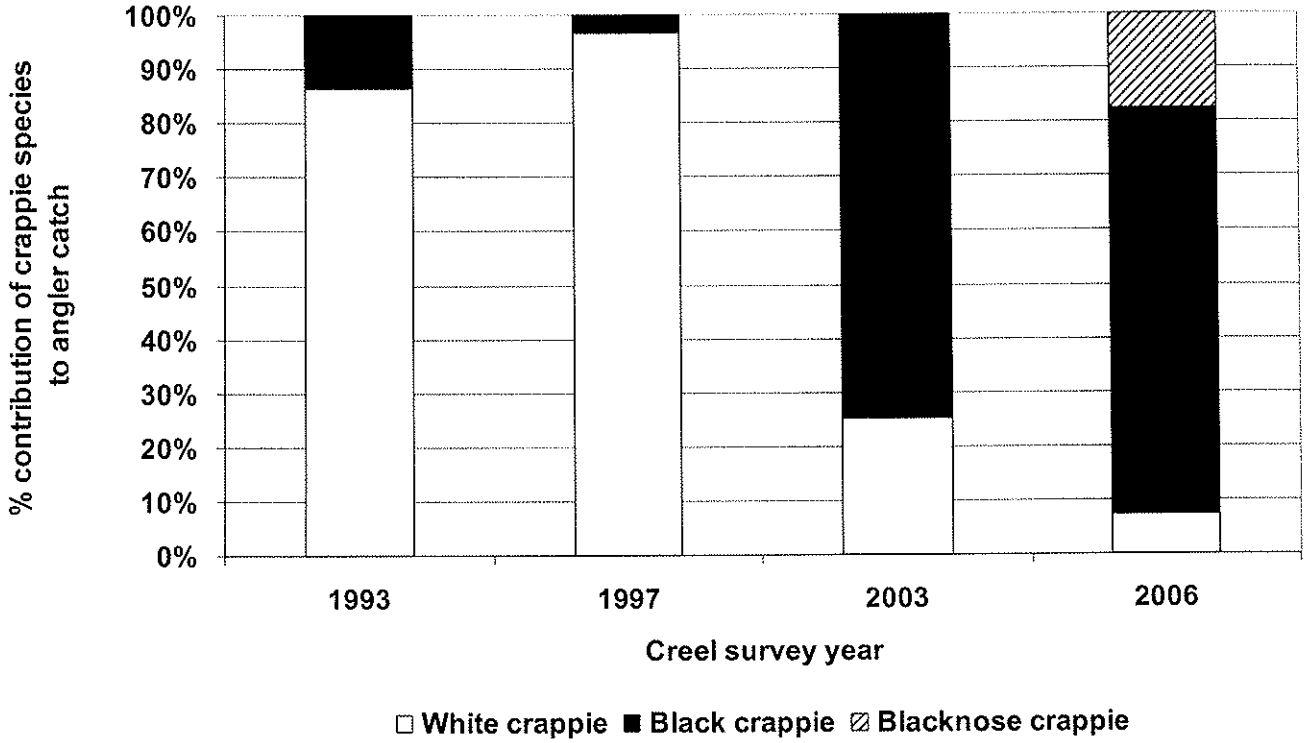

Figure 1. Percent contribution of white, black, and blacknose crappie to the angler catch in daytime creel surveys conducted on Laurel River Lake in 1993, 1997, 2003, and 2006.

LAUREL RIVER LAKE ANGLER ATTITUDE SURVEY 2003

1. Have you been surveyed this year? Yes - stop survey No – continue

2. Name _____ and Phone number _____ **(Optional)**

3. Which species of fish do you fish for at Laurel River Lake (check all that apply)? **(n=513)**

   81% Bass **26%** Crappie **17%** Trout **20%** Walleye **2%** White bass **3%** Other

4. Which one species do you fish for most at Laurel River Lake (check only one)?

   75% Bass **11%** Crappie **4%** Trout **9%** Walleye **2%** White bass

-Answer the following questions for each species you fish for – (see question 3)

Crappie Anglers (n=90)

5. What level of satisfaction do you have with crappie fishing at Laurel River Lake?

   10% Very satisfied **24%** Somewhat satisfied **2%** Neutral **41%** Somewhat dissatisfied **22%** Very dissatisfied

6. Do you support or oppose the 9-inch size limit on crappie at the lake? **88%** Support **12%** Oppose **0%** No opinion/don't know

6b. What size limit would you prefer on crappie at the lake? 24% No size limit 2% 8" **60%** Current (9") 14% 10" **1%** Other

7. Do you support or oppose the 30 fish creel limit on crappie at the lake? **39%** Support **61%** Oppose **0%** No opinion/don't know

7b. What creel limit would you prefer on crappie at the lake? 34% **Current (30)** 4% **20** 51% **15** **12%** **10** 0% **Other**

Figure 2. Angler attitude survey results collected during the 2003 creel survey at Laurel River Lake.

LAUREL RIVER LAKE ANGLER ATTITUDE SURVEY 2006

1. Have you been surveyed this year? Yes - stop survey No – continue

2. Name _____ and Phone number _____ **(Optional)**

3. Which species of fish do you fish for at Laurel River Lake (check all that apply)? **(n=362)**

   89% Bass 14% Crappie 6% Trout 32% Walleye 2% Bluegill 1% Catfish

4. Which one species do you fish for most at Laurel River Lake (check only one)?

   78% Bass 4% Crappie 2% Trout 16% Walleye 1% Bluegill

-Answer the following questions for each species you fish for – (see question 3)

Crappie Anglers (n=49)

5. What level of satisfaction do you have with crappie fishing at Laurel River Lake?

   8% Very satisfied 65% Somewhat satisfied 20% Neutral 6% Somewhat dissatisfied 0% Very dissatisfied

6. During the past three years, do you believe the crappie fishing in Laurel River Lake has?

   37% Greatly improved 51% Slightly improved 12% Stayed about the same 0% Slightly declined 0% Greatly declined

7. Do you support or oppose the 9-inch size limit on crappie at the lake? 100% Support 0% Oppose 0% No opinion/don't know

7b. What size limit would you prefer on crappie at the lake? 61% Current (9") 39% Other (10")

8. Do you support or oppose the 15 fish creel limit on crappie at the lake? 100% Support 0% Oppose 0% No opinion/don't know

8b. What creel limit would you prefer on crappie at the lake? 96% Current (15) 0% 30 4% 10 0% Other

Figure 3. Angler attitude survey results collected during the 2006 creel survey at Laurel River Lake.