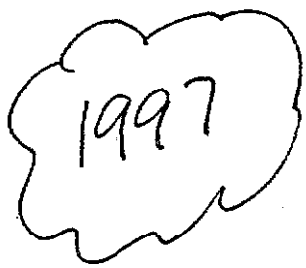
FISHERIES INVESTIGATIONS IN LAKES AND STREAMS

DISTRICT IV

JULY 1, 1996 - JUNE 30, 1997



ANNUAL PROGRESS REPORT

F-63-3-4

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[Cove Rotenone]

Cove rotenone sampling was used to assess standing stocks of fish in Lake Monticello in August of 1996. Three coves totaling 1.84 hectares (4.54 acres) were sampled at Lake Monticello. These coves were the same coves used in sampling conducted in 1987, 1988, and 1995. Surface acreage and depths were determined for all coves. Coves were blocked with 9.5 mm mesh netting to prevent the passage of fish to and from the sample area. A gasoline powered pump was used to disburse diluted 5% emulsifiable rotenone at a concentration of 1 mg/l. On the first day, all fish collected were identified, sorted into inch groups, counted and weighed. On the second day, fish were picked up, sorted to species and inch groups, and counted. Weights for fish picked up on the second day were calculated from the first day weights by finding the average weight by inch group and multiplying the average weight by the number of fish counted on the second day for each species. If a new species was collected the second day, weights were derived from length-weight relationships of common South Carolina freshwater fish (May 1984). If a species could not be located in a length-weight table or from historic data, a weight from a similar species was used for the calculations. All data were presented in English units to aid in comparisons with previous data collections. Computer analysis of the data were accomplished with a personal computer using SAS software for data analysis (1985).

[Trap Netting]

Trap netting in Lake Monticello has been very ineffective in providing an adequate sample of crappie for population analysis in previous years. In 1996, we experimented with some wire baskets and increased our catch of crappie while reducing the amount of effort. In 1997, we compared the catch per unit effort and mean lengths of crappie capture with the two methods.

Due to the poor success of using trap nets in Lake Monticello, trap netting will be discontinued. Future efforts to collect crappie for population analysis will rely on wire baskets and electrofishing.

[Cove Rotenone]

In 1996, standing stocks of fish in the three coves ranged from 148 lbs/acre to 663 lbs/acre. Standing stocks averaged 431 lbs/acre for the three coves sampled. Twenty-seven species of fish were captured (Table 3). Only eleven of the twenty-seven species collected contributed more than one pound per acre. Gizzard shad (26.1%), channel catfish (24.1%), blue catfish (12.8%), bluegill (12%) and white catfish (11.9%) comprised almost 87% of the total standing stocks (Table 4.)

Standing stocks were higher in 1996 (431 lbs/acre) than in any of the previous years. The high standing stocks in 1996 were attributed to increases in blue catfish, gizzard shad, white catfish, channel catfish, white perch and bluegill. Catfish species comprised 56 percent of the standing stocks in the reservoir and contributed about 240 pounds per acre, followed by gizzard shad (21.4%) and bluegill (11.6%).

Of the 27 species observed in the 1996 study, gar was the only species previously unrecorded. Brown bullheads, brook silversides and white crappie were not found in this study but were recovered in previous studies.

The presence of blue catfish in the Lake Monticello fishery remains a concern. Blue catfish populations exploded from about 7 pounds per acre in 1995 to 110 pounds per acre in 1996. Species such as black crappie and white bass appeared to decline during that period, based on cove rotenone sampling. However, the ineffectiveness of cove sampling for those two species

Table 3. Standing stocks (pounds) of fish collected from summer cove rotenone sampling in Lake Monticello, South Carolina, for 1987, 1988, 1995, and 1996.

Species	Year			
	1987	1988	1995	1996
Gar	--	--	--	T
Gizzard shad	75.4	33.0	41.8	92.2
Threadfin shad	14.7	9.5	1.53	2.5
Silvery minnow	--	0.3	0.01	0.1
Golden shiner	--	T	--	T
Whitefin shiner	0.5	0.1	0.13	4.4
Swallowtail shiner	--	--	0.04	T
River carpsucker	11.6	1.6	1.06	0.1
V-lip redhorse	13.0	6.0	0.86	2.2
Snail bullhead	--	0.1	0.07	T
White catfish	22.9	49.6	0.34	43.1
Blue catfish	--	--	6.85	110.4
Brown bullhead	--	--	T	--
Flat bullhead	0.3	T	0.37	0.1
Channel catfish	56.0	67.8	32.2	88.1
Mosquitofish	--	T	T	T
Brook silverside	--	--	T	--
White perch	--	--	0.45	22.0 ✓
White bass	0.6	0.3	26.8	0.2 ✓
Redbreast sunfish	0.3	0.1	0.03	0.1
Green sunfish	--	--	0.05	1.2
Pumpkinseed	3.1	4.9	0.77	2.8
Warmouth	1.3	0.8	0.01	0.3
Bluegill	51.2	49.9	16.5	50.0 ✓
Redear sunfish	0.9	1.9	0.77	0.8
Largemouth bass	4.1	5.7	3.74	5.8 ✓
White crappie	--	1.0	--	--
Black crappie	7.8	5.5	0.01	0.4
Tessellated darter	T	T	T	T
Yellow perch	9.8	13.2	--	3.9
Total standing stock	273.5	251.1	137.8	430.8

T= trace = <1%

Table 4. Standing stocks of fish by percent composition (E values), collected during summer cove rotenone sampling in Lake Monticello.

Species	Year 1987	1988	1995	1996
Gar	--	--	--	T
Gizzard shad	27.5	13.1	30.3	21.4
Threadfin shad	5.4	3.8	1.11	0.6
Silvery minnow	--	0.1	0.01	0.1
Golden shiner	--	T	--	T
Whitefin shiner	.02	T	0.09	1.0
Swallowtail shiner	--	--	0.03	T
River carpsucker	4.2	0.6	0.77	T
V-lip redhorse	4.8	2.4	0.63	0.5
Snail bullhead	--	T	0.05	T
White catfish	8.4	19.7	0.25	10.0
Blue catfish	--	--	4.97	25.6
Brown bullhead	--	--	T	--
Flat bullhead	0.1	T	0.27	T
Channel catfish	20.5	27.0	23.4	20.4
Mosquitofish	--	T	T	T
Brook silverside	--	--	T	--
White perch	--	--	0.33	5.0
White bass	0.2	0.1	19.4	T
Redbreast sunfish	0.1	T	0.02	T
Green sunfish	--	--	0.04	0.3
Pumpkinseed	1.1	2.0	0.56	0.6
Warmouth	0.5	0.3	0.01	0.1
Bluegill	18.7	19.9	12.0	11.6
Redear sunfish	0.3	0.8	0.56	0.2
Largemouth bass	1.5	2.3	2.72	1.3
White crappie	--	0.4	--	--
Black crappie	2.9	2.2	0.01	0.1
Tessellated darter	T	T	T	T
Yellow perch	3.6	5.3	2.54	0.9
	100.0%	100.0%	100.0%	100.0%

T= trace value (0.001)

must be considered. Lake Monticello does have a relatively low prey base and it would not be a likely candidate for the introduction of any additional piscivorous species, including striped or hybrid bass or blue catfish. The unfortunate introduction of blue catfish may lead to competition for forage between catfish and game species.

[Meter Netting]

Results of meter net sampling from Lake Monticello during 1997 demonstrated that threadfin shad continued to dominate the age 0 clupeid prey base (Table 5). This trend is consistent with sampling results from 1987, 1988, and 1989 (Christie and Stroud, 1992).

The population density of threadfin shad in Lake Monticello is relatively low, particularly when compared to the Catawba-Wateree populations (Christie and Stroud, 1992, 1995). Of the two sampling stations on Lake Monticello, the northern station near county road 99 (Station B) produced the lowest percentages of gizzard shad (Table 5) and the highest densities of threadfin shad (Table 6, Figure 22).

Population densities of age 0 shad were highest in the 10 - 19 mm size group with highest mortalities between 30 and 39 mm (Figure 23). The population density of threadfin shad for 1997 was lower than that for 1989 (Figure 24); however, statistical comparisons (analysis of covariance) indicated no significant difference between the years sampled (95% confidence level).

JOB PROGRESS REPORT

STATE: South Carolina PROJECT NO.: F-63

PROJECT TITLE: Fisheries Investigations in Lakes and Streams

SECTION: Reservoir and Stream Survey and Inventory - Fisheries District IV

JOB NO. 3.: Data Analysis and Report Writing

PERIOD COVERED: July 1, 1996 through June 30, 1997

Summary

All reporting for work conducted under this section was conducted as needed and is reflected in this report except where noted.

Materials and Methods

All report writing and data analysis was conducted at the Fisheries District IV office located in Rock Hill, South Carolina. Data analysis was conducted using personal computers.

Results

All reporting for work conducted under this section was conducted as needed and is reflected except where noted.

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