

# **MILLERS FERRY MANAGEMENT REPORT**

**2006**

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## **Introduction**

Millers Ferry Reservoir is a 17,200-acre reservoir on the Alabama River, impounded by the U.S. Army Corps of Engineers in 1969 (Table 1, Figure 1). The official name of this reservoir is William (Bill) Dannelly Reservoir; however, it is best known by area anglers as "Millers Ferry." The primary objective in managing the fisheries resources of Millers Ferry Reservoir is to maintain and enhance the sport fishery. Millers Ferry has been sampled under the reservoir management program since 1985. Results of these efforts are summarized in previous management reports (Tucker et al. 1999, Armstrong et al. 1997, Armstrong et al. 2002). Management activities have included standardized sampling, aquatic plant management, mini- and tailwater creel censuses, general surveillance, and the stocking of Gulf-strain and Atlantic-strain striped bass, hybrid striped bass, and Florida largemouth bass (Table 2).

The sport fishery provided by Millers Ferry is important to the southwest region of Alabama from a recreational and economic standpoint. Results of the Bass Angler Information Team (B.A.I.T.) program attest to the quality and importance of the largemouth bass fishery in Millers Ferry Reservoir. The bass fishing in this lake typically ranks in the top 10 overall for reservoirs in Alabama (Haffner 2006). This reservoir also provides an excellent crappie fishery. Human population growth in South Alabama will result in sustained or increased fishing pressure and economic benefit. The area surrounding Millers Ferry Reservoir is rural though excellent local recreational facilities continue to attract anglers.

## **Methods**

Sampling methods during April 5-7, 2006, included electrofishing using standardized procedures (Cook 1999). Sampling sites are indicated on the reservoir map (Figure 1). Target species for electrofishing were largemouth bass, bluegill, gizzard shad, and threadfin shad. Species

diversity was sampled by devoting a portion of the sampling period to collection of all fish; however, no measurements of diversity were made in this analysis. Total length (mm) and weight (g) were recorded for all fish collected. For age determination of largemouth bass, otoliths were removed and preserved. All otoliths were read by two readers under a dissecting microscope. Discrepancies in age of the otolith were reconciled during a third read in concert between the two readers. Any largemouth bass older than four years were sectioned and read under a compound microscope using the methods outlined by Maceina (1988).

Significant aspects of reservoir sampling are discussed in the narrative portion of this report. The reader is encouraged to take note of the appendices of this report for additional information.

## **Results**

### **Largemouth Bass**

Electrofishing produced a sample of 133 largemouth bass, 103 of which were stock-length or longer (Tables 3 and 4). Of the age classes that were present, over 90% of the sample consisted of age 1 (2005, 15%), age 2 (2004, 42.1%), age 3 (2003, 14.3%), and age 4 (2002, 18.8%) fish (Table 5). No fish were collected between the ages of 7 and 10; however, one age-11 fish was collected (Tables 5 and 6, Figure 4).

Relative stock density (RSD) analysis of the sample indicated that stock-length largemouth bass were the most abundant size group (40%), while quality-, preferred-, and memorable-length fish comprised 33%, 26%, and 1%. The sub-stock ratio was 29% (Table 4). All RSD and catch-rate values fell within or exceeded the inner quartile range (IQR) of statewide RSD values, except for memorable-length largemouth bass which were lower than the statewide IQR for both catch rates and RSD values (Figure 2 and 3). This difference was not tested for statistical significance. Relative weights of largemouth bass were low across all length groups (range 78-90).

### **Bluegill Sunfish**

The 2006 bluegill sunfish sample was comprised of 127 stock-length fish and included length groups from 40 to 200 mm (Figure 5). Stock-length fish made up 88% of the sample, with 11% in the quality-size group. These RSD values were equal to the results for bluegill sunfish in 2002 (Table 4, Figure 6). Catch-per-unit effort was lower for all length groups compared to 2002 (Figure 7). RSD and catch-rate values for bluegill were within the statewide IQR with the exception of quality-length fish which were lower (Figure 6 and 7). This difference was not tested for statistical significance. Relative weight values for RSD groups were low across all RSD groups ranging from 88 to 92 (Table 4).

### **Gizzard Shad and Threadfin Shad**

Gizzard shad catch rates (Sub-stock = 17.4, Stock = 30.1, Quality = 0.9) and  $W_r$  values (Stock = 87, Quality = 94) were higher than the values found in 2002. In 2006, RSD values for gizzard shad at both stock-length (N = 97) and quality-length (N = 3) were within one unit of measurement from samples taken in 2002 (Table 4). Gizzard shad lengths ranged from 110 to 310 mm with a mean  $W_r$  of 87 (Table 4, Figure 8).

Threadfin shad catch rates were higher in 2006 (74.2) than in 2002 (Table 4). The threadfin shad sample consisted of 167 fish with total lengths ranging from 80 to 140 mm (Table 4, Figure 9).

## **Discussion**

The largemouth bass population tended to be consistent between the 2002 and 2006 samples. Quality-length and longer largemouth bass comprised 60% of the sample.

The bluegill sunfish population is in a stable condition as RSD values were the same across stock-, quality-, and preferred-length fish between 2002 and 2006. Relative weights were higher during 2006 for stock- and quality-lengths and lower during 2006 for preferred-lengths; however these values were similar to those measured during the previous five samples (Table 4).

Catch rates in 2006 were lower for largemouth bass and bluegill sunfish and higher for both threadfin shad and gizzard shad than in 2002. This can be attributed to the number of main-stem river sample sites where largemouth bass and bluegill sunfish densities are lower and shad species densities are higher than in backwater areas.

## **Recommendations**

1. There are no management recommendations for any sportfish species at this time.
2. Spring electrofishing for largemouth bass, bluegill, and shad will be conducted in 2008.
3. Trapnetting will be conducted during Fall, 2006, to evaluate the crappie population.
4. A mini-creel survey will be conducted during Spring, 2007, to gather angler information.

## LITERATURE CITED

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# **APPENDIX A**

## **TABLES AND FIGURES**

TABLE 1. MORPHOMETRIC, PHYSICAL, AND CHEMICAL CHARACTERISTICS OF MILLERS FERRY RESERVOIR

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Surface area	17,200	acres
Drainage area	20,637	sq. mi.
Full pool elevation	80	feet-msl
Mean annual fluctuation	1	foot
Shoreline distance	516	miles
Shoreline development index	28.1	
Mean depth	19.3	feet
Maximum depth	60	feet
Total dissolved solids	100	mg/l
Morphoedaphic index	5.2	TDS/mean depth(ft) (Ryder 1965)
Growing season	230	frost free days (Jenkins 1967)
Reservoir age	37	years

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TABLE 2. FISH STOCKING IN MILLERS FERRY RESERVOIR, 1993-2006.

Species	Year	No/Ac	Size (in)	Total
Largemouth Bass (Florida)	1993	2	1 - 2	34,520
	1994	4	1 - 2	70,611
Hybrid Striped Bass	1993	11	1 - 2	182,040
	1994	3	1 - 2	55,060
	1995	3	1 - 2	51,600
	1996	3	1 - 2	51,800
	1997	5	1 - 2	78,728
	1998	3	1 - 2	51,085
	1999	3	1 - 2	52,072
	2000	5	1 - 2	89,837
	2001	4	1 - 2	69,200
	2002	3	1 - 2	52,000
	2003	3	1 - 2	52,100
Striped Bass (Atlantic)	1999	2	1 - 2	33,600
	2001	2	1 - 2	34,020
Striped Bass (Gulf)	1993	2	1 - 2	34,487
	1994	< 1	1 - 2	3,400
	1995	2	1 - 2	34,400
	1996	5	1 - 2	80,375
	1997	3	1 - 2	45,265
	1998	4	1 - 2	68,448
	2000	3	1 - 2	51,200
	2003	2	1 - 2	34,160
	2004	2	1 - 2	34,050
2005	2	1 - 2	34,166	
2006	2	1 - 2	34,103	

TABLE 3. NUMBER OF SPECIES COLLECTED BY ELECTROFISHING FROM MILLERS FERRY RESERVOIR, 2006.

Species	Number	Electrofishing Catch Statistics	Total Effort
		Catch-per-Unit Effort	(hrs)
Largemouth bass	133	38.0	3.50
Spotted bass	14	4.0	3.50
Bluegill sunfish	128	60.1	2.13
Redear sunfish	18	5.8	3.13
Gizzard shad	103	48.4	2.13
Threadfin shad	167	74.2	2.25
Longear sunfish	19	23.9	0.79
Black crappie	10	12.6	0.79
White crappie	9	11.3	0.79
Spotted gar	11	13.8	0.79
Chain pickerel	1	1.3	0.79
Channel catfish	6	7.6	0.79
Blacktail redhorse	21	26.4	0.79
Smallmouth buffalo	17	21.4	0.79
Spotted sucker	1	1.3	0.79
Freshwater drum	4	5.0	0.79
Silverside shiner	11	13.8	0.79
Spottail shiner	2	2.5	0.79
Warmouth	2	2.5	0.79
Golden redhorse	1	1.3	0.79
<i>Notropis spp.</i>	9	11.3	0.79

TABLE 4. RELATIVE STOCK DENSITY, CATCH-PER-EFFORT, AND RELATIVE WEIGHT OF TARGET SPECIES IN MILLERS FERRY RESERVOIR 1988 THROUGH 2006.

Species and Year	Gear	Number Samples	Total Effort	TOTAL NUMBER, CPE, PERCENT OF SAMPLE AND Wr																				
				SUBSTOCK			RSD-S				RSD-Q				RSD-P				RSD-M				TOTAL	
				no.	cpe	pct.	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe	pct.	Wr	no.	cpe
Largemouth bass 1988	elec	.	.	7	4.4	7	32	20.0	32	.	36	22.5	36	.	26	16.3	26	.	7	4.4	7	.	108	63.2
Largemouth bass 1989	elec	.	.	58	35.8	58	35	20.0	34	.	33	18.9	33	.	31	17.7	31	.	2	1.1	2	.	159	57.7
Largemouth bass 1990	elec	.	.	37	20.2	37	38	20.8	38	.	20	10.9	20	.	39	21.3	39	.	3	1.6	3	.	137	54.6
Largemouth bass 1992	elec	.	.	47	44.8	47	22	21.0	22	90	43	41.0	43	93	30	28.6	30	92	5	4.8	5	92	147	95.4
Largemouth bass 1993	elec	.	.	16	6.9	16	53	22.7	53	86	23	9.9	23	92	21	9.0	21	92	3	1.3	3	92	116	42.9
Largemouth bass 1994	elec	.	.	6	1.1	6	54	10.2	49	90	44	44.0	40	99	10	10.0	9	94	2	0.4	2	90	116	64.6
Largemouth bass 1995	elec	7	3.5	8	2.3	7	32	9.2	29	88	32	9.2	29	90	38	10.9	35	95	7	2.1	6	94	117	33.7
Largemouth bass 1996	elec	3	1.3	40	30.8	40	60	46.2	60	90	23	17.7	23	93	14	10.8	14	95	3	2.3	3	92	140	107.7
Largemouth bass 1999	elec	4	2.0	9	4.5	9	53	26.5	50	94	31	15.0	30	97	20	9.5	19	99	1	0.5	1	93	114	57.0
Largemouth bass 2002	elec	4	2.0	46	23.6	37	65	33.3	53	87	28	14.4	23	85	19	9.7	15	88	11	5.6	9	93	169	86.7
Largemouth bass 2006	elec	7	3.5	30	8.6	29	41	11.7	40	88	34	9.7	33	90	27	7.7	26	89	1	0.3	1	78	133	38.0
<b>Lake Average</b>		<b>5</b>	<b>2.4</b>	<b>28</b>	<b>16.6</b>	<b>27</b>	<b>44</b>	<b>22.0</b>	<b>42</b>	<b>89</b>	<b>32</b>	<b>19.4</b>	<b>30</b>	<b>92</b>	<b>25</b>	<b>13.8</b>	<b>24</b>	<b>93</b>	<b>4</b>	<b>2.2</b>	<b>4</b>	<b>91</b>	<b>132</b>	<b>63.8</b>
Bluegill sunfish 1995	elec	7	3.5	40	11.3	34	104	29.5	88	90	14	4.0	12	97									158	44.8
Bluegill sunfish 1996	elec	3	1.4	65	46.8	57	103	74.1	90	88	10	7.2	9	92	1	0.7	1	103					179	128.8
Bluegill sunfish 1999	elec	4	1.4	7	4.9	7	97	67.8	94	98	6	4.2	6	104									110	76.9
Bluegill sunfish 2002	elec	4	1.5	0			140	94.0	88	89	17	11.4	11	85	2	1.3	1	92					159	106.7
Bluegill Sunfish 2006	elec	5	2.1	1	0.5	1	112	52.6	88	92	14	6.6	11	92	1	0.5	1	88					128	60.1
<b>Lake Average</b>		<b>4.6</b>	<b>2.0</b>	<b>23</b>	<b>15.9</b>	<b>25</b>	<b>111</b>	<b>63.6</b>	<b>90</b>	<b>91</b>	<b>12</b>	<b>6.7</b>	<b>10</b>	<b>94</b>	<b>1</b>	<b>0.8</b>	<b>1</b>	<b>94</b>					<b>147</b>	<b>83.5</b>
Threadfin shad 1995	elec	7	3.5				106	30.0	100														106	30.0
Threadfin shad 1996	elec	3	1.4				43	30.7	100														43	30.7
Threadfin shad 1999	elec	4	1.7				134	78.4	100														134	78.4
Threadfin shad 2002	elec	4	2.0				31	15.9	100														31	15.9
Threadfin shad 2006	elec	7	2.3				167	74.2	100														167	74.2
<b>Lake Average</b>		<b>5</b>	<b>2.2</b>				<b>96</b>	<b>45.8</b>	<b>100</b>														<b>96</b>	<b>45.8</b>
Gizzard shad 1995	elec	7	3.5	106	30.0		27	7.6	90	87	3	0.9	10	86									136	38.5
Gizzard shad 1996	elec	3	1.4								63	45.0	100	83									63	45.0
Gizzard Shad 1999	elec	4	2.0																				19	9.5
Gizzard shad 2002	elec	4	2.0	2	1.0		46	23.6	98	84	1	0.5	2	87									49	25.1
Gizzard shad 2006	elec	5	2.1	37	17.4	56	64	30.1	97	87	2	0.9	3	94									103	48.4
<b>Lake Average</b>		<b>4.6</b>	<b>2.2</b>	<b>48</b>	<b>16.1</b>	<b>56</b>	<b>46</b>	<b>20.4</b>	<b>95</b>	<b>86</b>	<b>17</b>	<b>11.8</b>	<b>29</b>	<b>88</b>									<b>74</b>	<b>33.3</b>

TABLE 5. AGE COMPOSITION AND MEAN LENGTH OF LARGEMOUTH BASS FROM MILLERS FERRY RESERVOIR, SPRING, 2006.

Annulus	Year Class	Number	Percent	CPE	Mean Length (mm)	Standard Error	Length Range (mm)
1	2005	20	15.0	5.7	126	5.7	83-93
2	2004	56	42.1	16.0	239	5.8	151-349
3	2003	19	14.3	5.4	349	7.4	305-416
4	2002	25	18.8	7.1	379	9.3	313-509
5	2001	3	2.3	0.9	427	9.5	413-445
6	2000	9	6.8	2.6	478	8.4	435-517
7	1999	0	0.0	0.0	0		
8	1998	0	0.0	0.0	0		
9	1997	0	0.0	0.0	0		
10	1996	0	0.0	0.0	0		
11	1995	1	0.8	0.3	480		480
		133	100.0	38.0			
Total effort = 3.50 hrs							

TABLE 6. LENGTH AT AGE OF LARGEMOUTH BASS FROM MILLERS FERRY RESERVOIR, SPRING, 2006.

Length (mm)	1	2	3	4	5	6	7	8	9	10	11	Total Number
75	2											2
100	7											7
125	9											9
150		2										2
175	2	8										10
200		11										11
225		14										14
250		7										7
275		9										9
300		3	4	1								8
325		2	7	8								17
350			4	4								8
375			2	3								5
400			2	5	2							9
425				3	1	1						5
450						3						3
475						3					1	4
500				1	2							3
<b>Total</b>	<b>20</b>	<b>56</b>	<b>19</b>	<b>25</b>	<b>3</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>133</b>

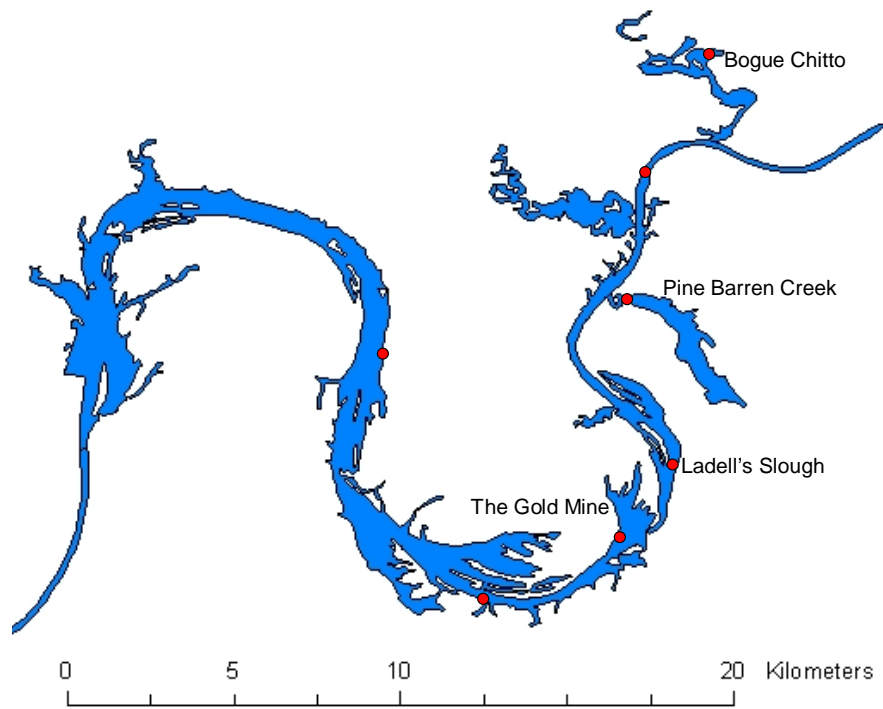


FIGURE 1. MILLERS FERRY RESERVOIR SPRING, 2006, SAMPLING SITES.

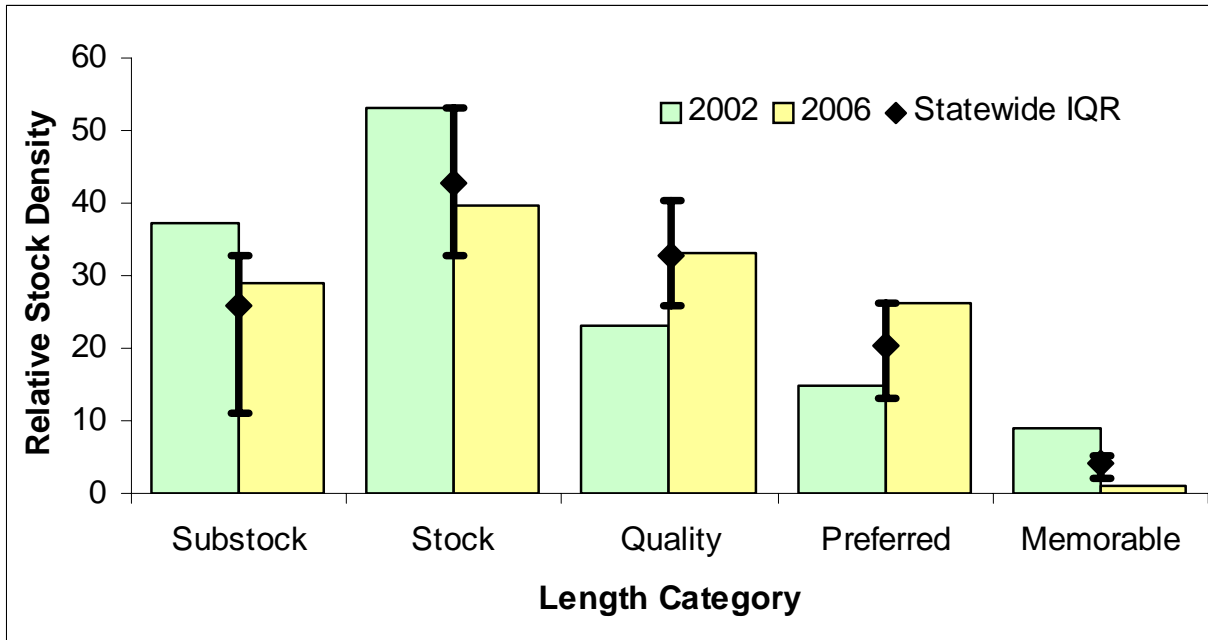


FIGURE 2. RELATIVE STOCK DENSITY (RSD) OF LARGEMOUTH BASS FROM MILLERS FERRY RESERVOIR 2002 AND 2006. THE I-BEAM DENOTES THE INNER QUARTILE RANGE FOR ALL ALABAMA RESERVOIRS.

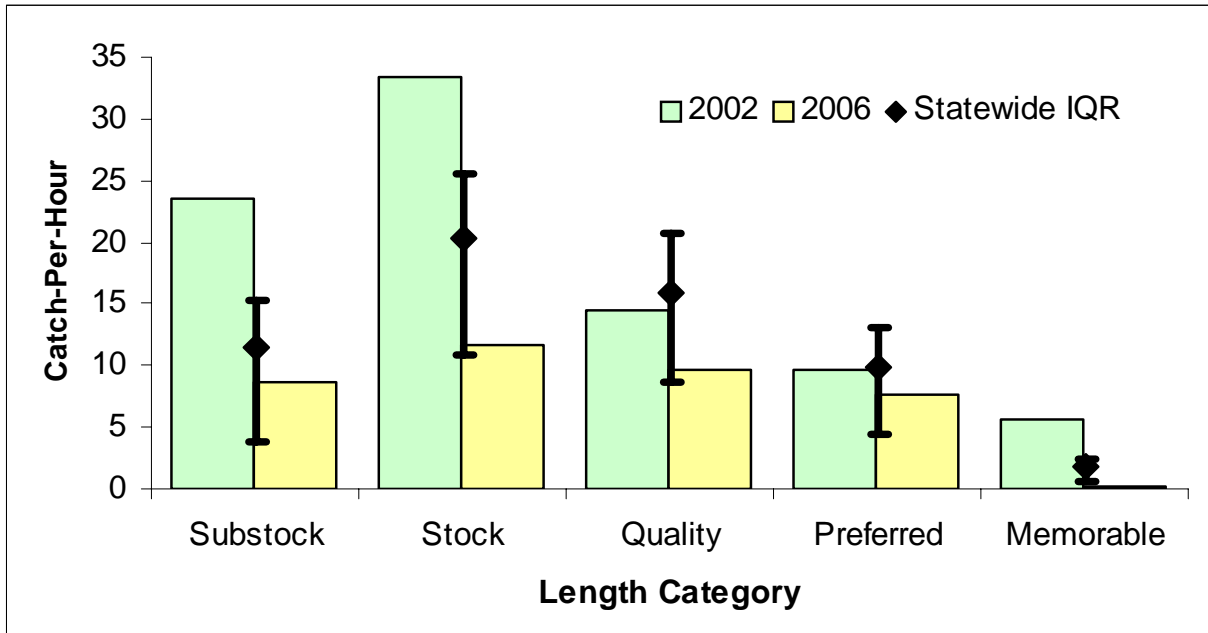


FIGURE 3. CATCH-PER-HOUR OF LARGEMOUTH BASS BY STOCK DENSITY INDICES FROM MILLERS FERRY RESERVOIR 2002 AND 2006. THE I-BEAM DENOTES THE INNER QUARTILE RANGE FOR ALL ALABAMA RESERVOIRS.

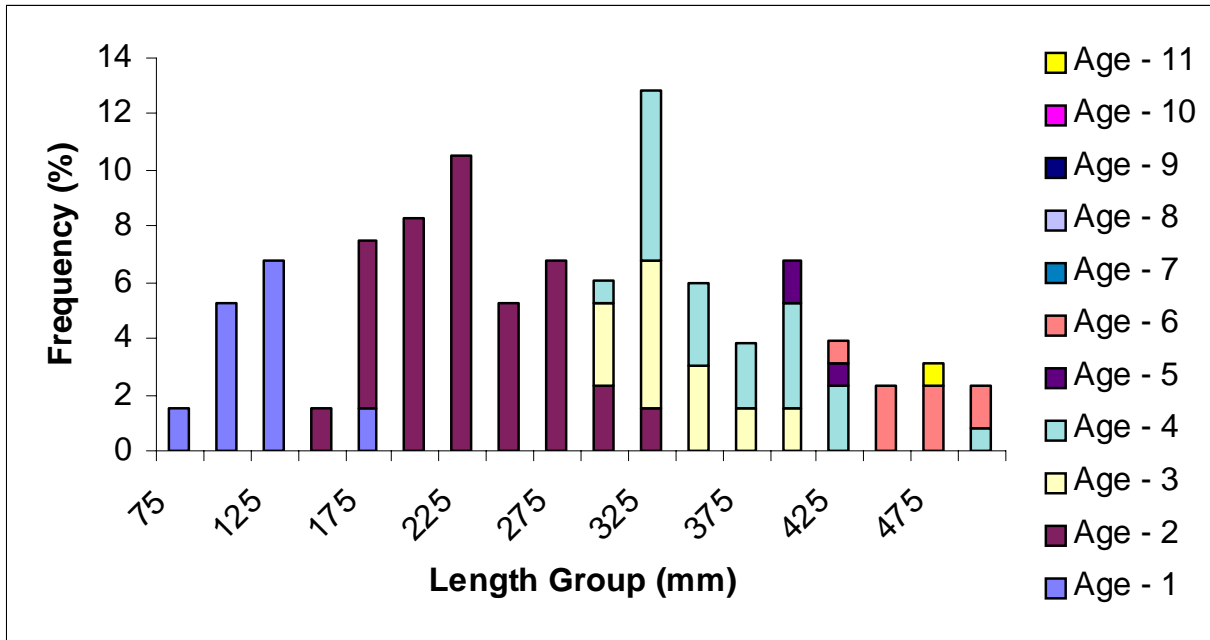


FIGURE 4. LENGTH-AT-AGE FREQUENCY OF LARGEMOUTH BASS FROM MILLERS FERRY RESERVOIR, SPRING, 2006.

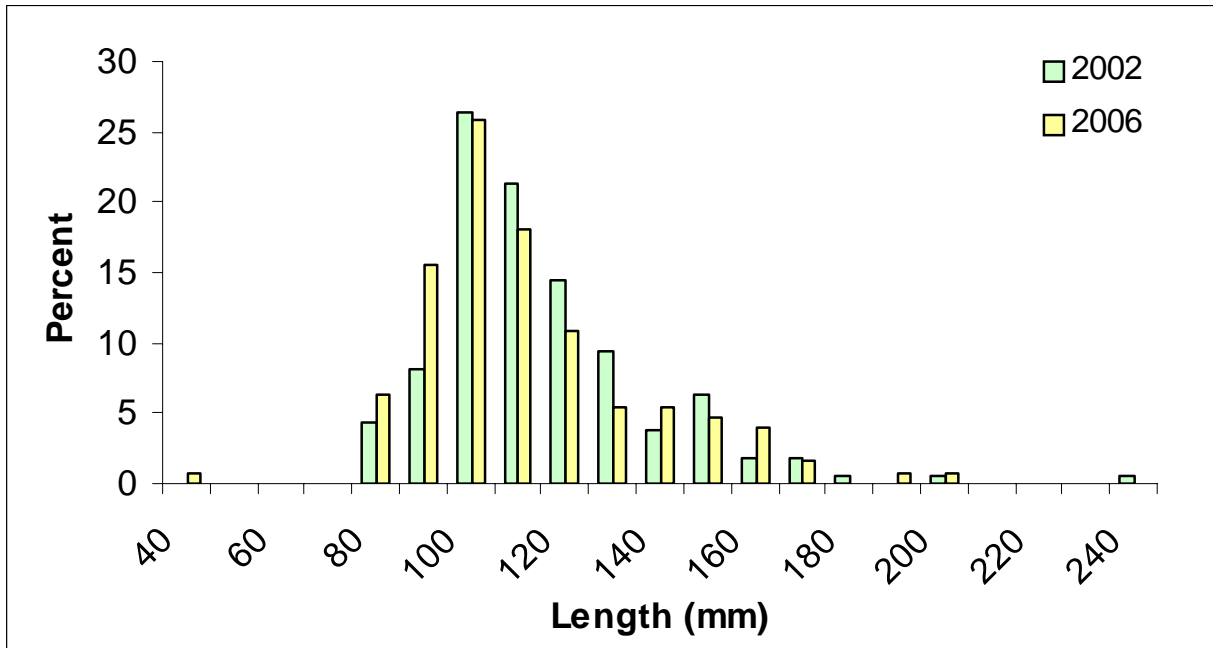


FIGURE 5. LENGTH FREQUENCY OF BLUEGILL SUNFISH FROM MILLERS FERRY RESERVOIR, SPRING, 2002 AND 2006.

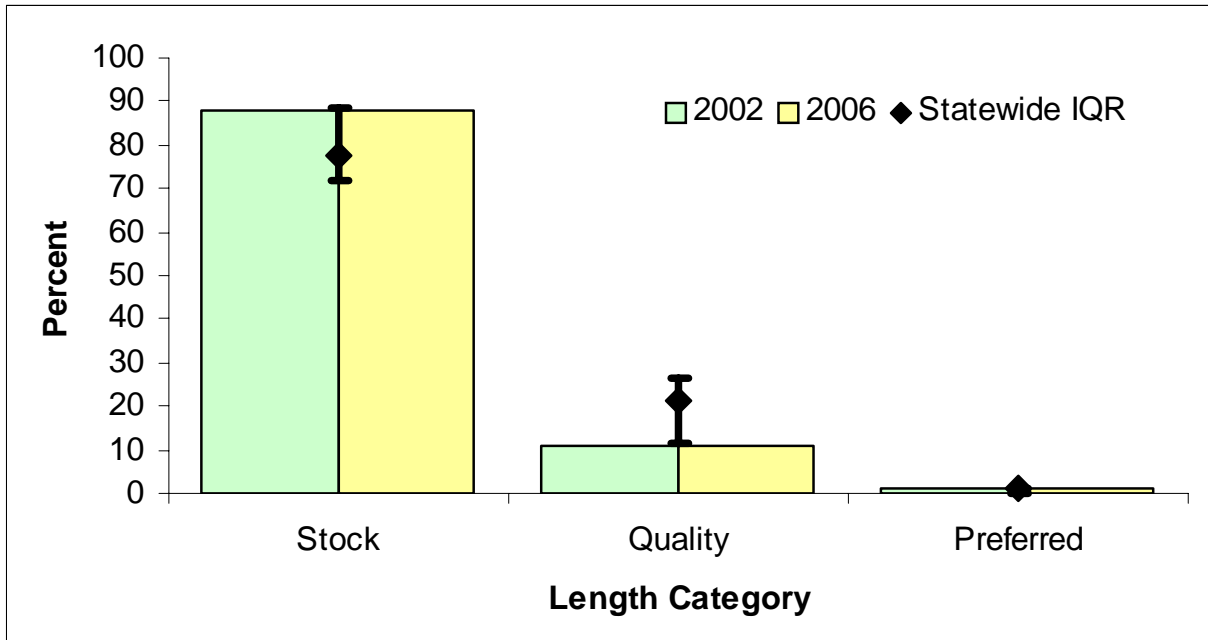


FIGURE 6. RELATIVE STOCK DENSITY (RSD) OF BLUEGILL SUNFISH FROM MILLERS FERRY RESERVOIR DURING SPRING 2002 AND 2006. THE I-BEAM DENOTES THE INNER QUARTILE RANGE FOR ALL ALABAMA RESERVOIRS.

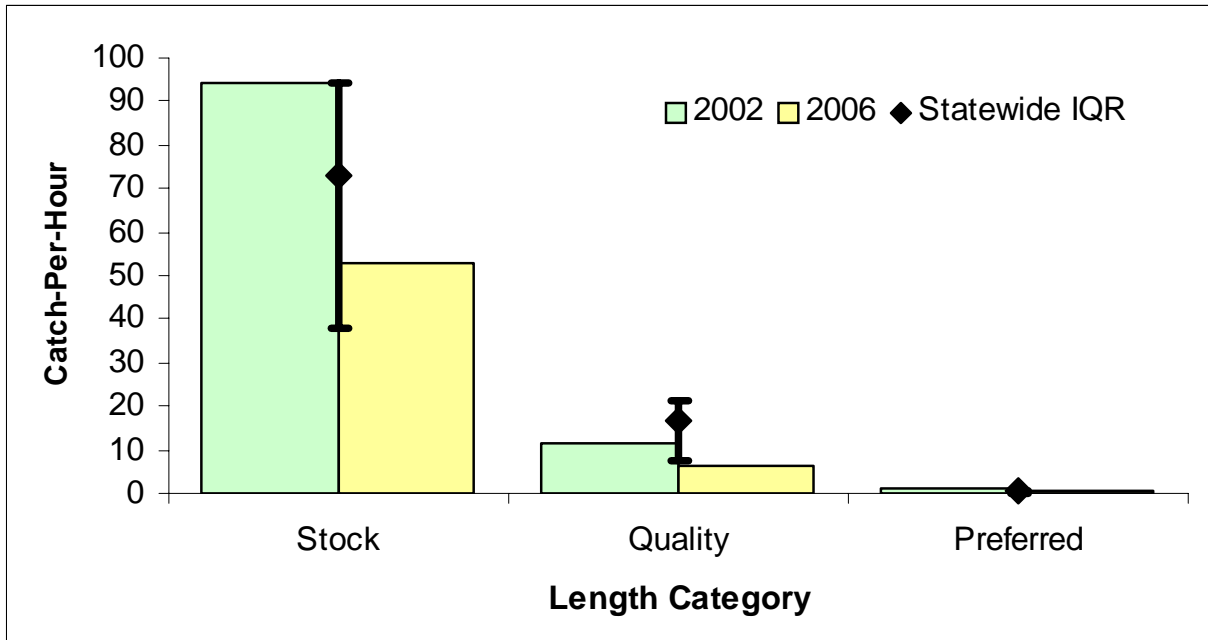


FIGURE 7. CATCH-PER-HOUR OF BLUEGILL SUNFISH BY STOCK DENSITY INDICES FROM MILLERS FERRY RESERVOIR 2002 AND 2006. THE I-BEAM DENOTES THE INNER QUARTILE RANGE FOR ALL ALABAMA RESERVOIRS.

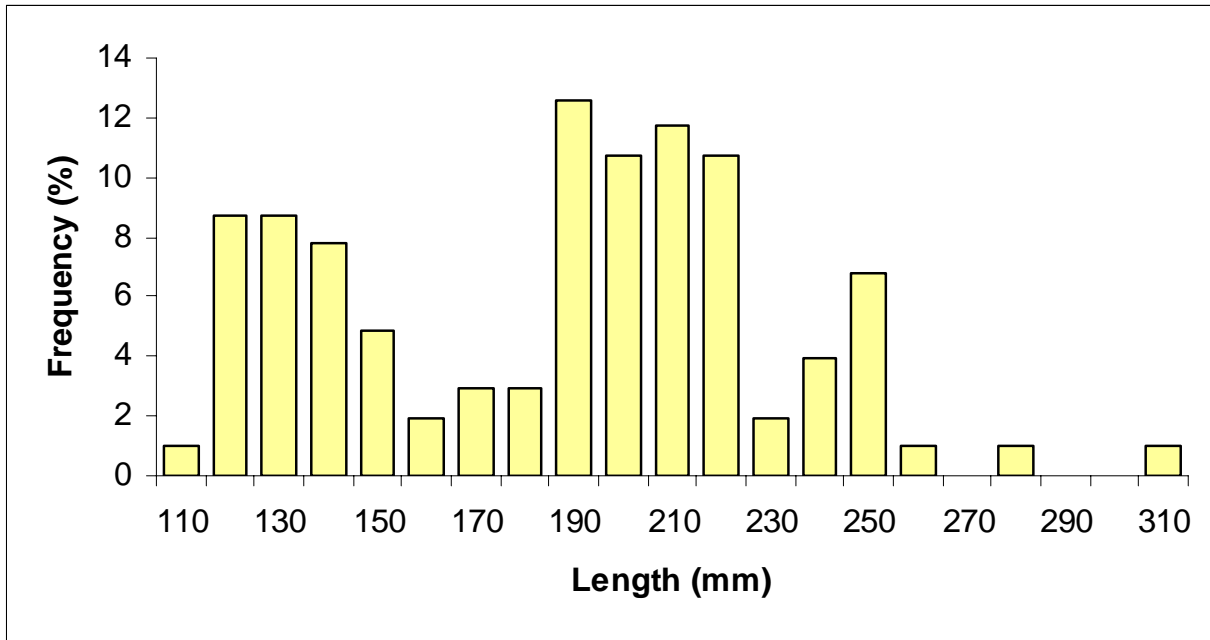


FIGURE 8. LENGTH FREQUENCY OF GIZZARD SHAD FROM MILLERS FERRY RESERVOIR, SPRING, 2006.

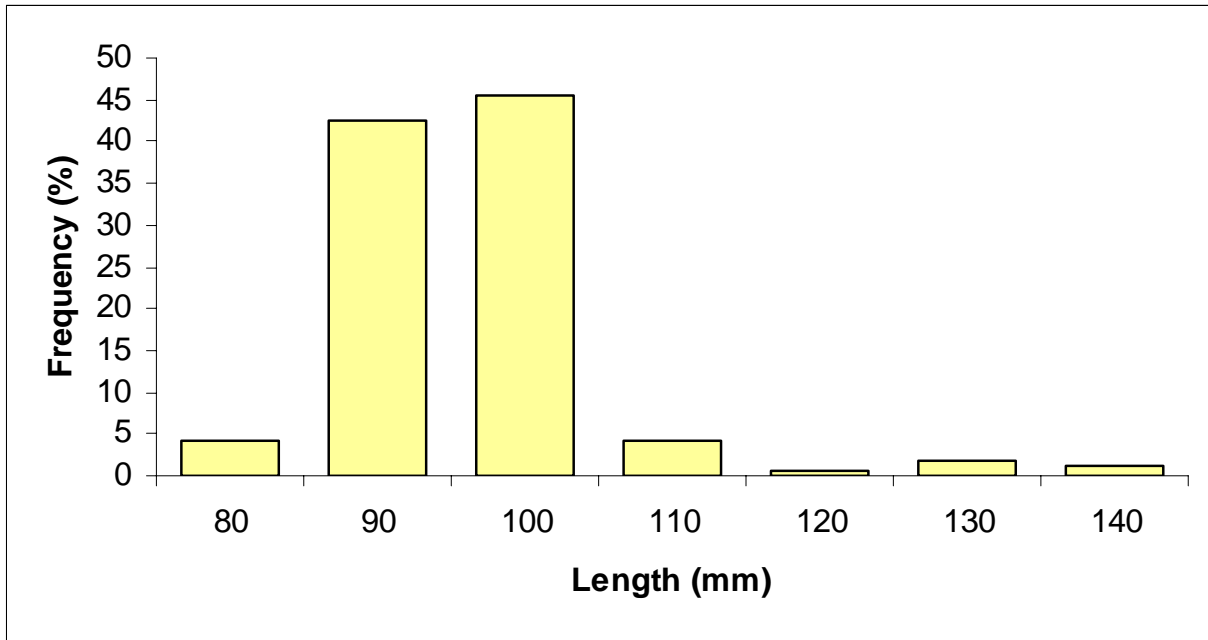


FIGURE 9. LENGTH FREQUENCY OF THREADFIN SHAD FROM MILLERS FERRY RESERVOIR, SPRING, 2006.