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A REPORT ON THE OPERATION OF A FISHWAY ON LAKE BISTINEAU, LA.

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Lake Bistineau is a 17,200 acre impoundment located in northwest Louisiana, in portions of Bossier, Webster, and Bienville Parishes. In 1954 the construction of a fishway on the spillway was completed. This fishway consisted of a four foot wide cement chute, 58 feet long with a one on five slope. Within the chute are 17, four feet high, wooden baffles located four feet 2.5 inches apart. Those baffles at the lower end of the fishway contain one rectangular opening in the top center two feet deep and 12.5 inches wide. The size of the opening gradually diminishes in width with each succeeding baffle to 8.5 inches for the top baffles. At the lower end of the chute are three openings 8.5 inches wide allowing fish to enter the structure. At the upper end is a well containing a basket or trap which when lowered retains all fish using the fishway and when raised allows unobstructed entrance into the lake proper.

The fishway was opened on March 1st in 1954 and in 1955. However, the actual periods during which fish were regularly found using the structure were April 10, 1954 through July 26, 1954 and May 4, 1955 through July 14, 1955. During these periods the basket trap was raised three times daily at 6 a. m., 12 noon, and 6 p. m.; all fish caught were identified and counted. All trash and commercial species were disposed of. Game species of available size which included Largemouth bass, *Micropterus salmoides* (Lacepede) and Spotted bass, *M. punctulatus* (Rafinesque) over ten inches; Black crappie, *Pomoxis nigromaculatus* (LeSueur) over 7 inches; Bluegill, *Lepomis macrochirus* Rafinesque; Redear sunfish, *L. microlophus* (Gunther) and Warmouth, *Chaenobryttus gulosus* (Cuvier) over 5 inches were measured, weighed, and tagged in the operculum with a monel strap tag. Game fish under available size were counted. All game fish were released into the lake proper.

The fishway was in operation 1.8 times more days in 1954 than in 1955, however, the number of fish using the structure was 403 fish, approximately 9% more in 1955. Tables 1 and 2 give a breakdown on the species and number using the fishway for each year. The species using the fishway most frequently both years was the Freshwater drum, comprising 54% in 1954 and 31% in 1955. The Catostomidae comprised 17% of 1954 and 30% in 1955. From the figures it became apparent that the fishway is a good source of stocking the impoundment with commercial species. In 1954 only 26.7% of the total number of fish were game species and in 1955, 24.9% were game species, Table 3. Of the game fish using the structure in 1955, approximately 39% were available size.

The trap was raised three times daily to ascertain if any species migrate and utilize the fishway at a particular time. It was found, Table 4 that more

fish (45%) were in the trap at the noon release than at the morning (28%) or the evening (27%). With the exception of the Freshwater drum which was trapped in equal numbers for each time, the majority of Catfish and Warmouth were trapped at night, the Smallmouth buffalo were trapped in the afternoon and the other species were trapped from 6 a. m. to noon. This would indicate that the structure could not be operated during a certain period of the day to admit only game species.

TABLE 1
Species and Number of Fish that used the Lake Bistineau Fishway
during the 77 Days of Operation in 1954

LAKE BISTINEAU FISHWAY 1954		77 DAYS
	No. of Fish	% of No. of Fish
PREDACEOUS SPECIES	322	6.76
Largemouth bass and Spotted bass*	248	5.20
Blue & Channel catfish*	55	1.15
Flathead catfish	2	0.04
White crappie	12	0.25
Black crappie	2	0.04
Gar	1	0.02
White bass	1	0.02
Yellow bass	1	0.02
FORAGE SPECIES	4,444	93.24
Bluegill	241	5.06
Redear sunfish	767	16.09
Freshwater drum	2,599	54.53
Carp sucker & Buffalo*	808	16.95
Spotted sucker	6	0.13
Gizzard shad	23	0.48
Total	4,766	100.00

* It was necessary that part time personnel be employed after the operation of the fishway basket trap. It was later learned that the ability of this part time personnel to identify these fish was unreliable; therefore, it was deemed necessary to group these species together.

TABLE 2
Species and Number of Fish that used the Lake Bistineau Fishway
during the 41 Days of Operation in 1955

	No. of Fish	% of No. of Fish
PREDACEOUS SPECIES	970	18.77
Largemouth bass	124	2.40
Spotted bass	198	3.83
Flathead catfish	5	0.10
Blue & Channel catfish*	643	12.44
FORAGE SPECIES	4,199	81.23
Bluegill	859	16.62
Redear sunfish	99	1.92
Warmouth	5	0.10
Black buffalo	233	4.51
Smallmouth buffalo	75	1.45
Bigmouth buffalo	3	0.06
Freshwater drum	1,602	30.99
Carp sucker	1,234	23.87
Spotted sucker	1	0.02
Gizzard shad	87	1.68
American eel	1	0.02
Total	5,169	100.00

* It was learned after the study had begun that the temporary field personnel which operated the fishway basket trap were not reliable in their ability to distinguish between these species; therefore, the authors considered it best to group them.

TABLE 3
A COMPARISON OF GAME FISH AND ROUGH FISH USING THE FISHWAY
IN 1954 AND 1955

	1954		1955	
	No.	% of Ttl. No.	No.	% of Ttl. No.
Game Fish	1,272	26.7	1,285	24.9
Rough Fish	3,494	73.3	3,884	75.1
TOTAL	4,766	100.0	5,169	100.0

TABLE 4
NUMBER OF FISH PRESENT WHEN THE TRAP WAS RAISED AT 6:00 A. M.,
12:00 P. M., AND 6:00 P. M. DURING THE 1955 OPERATION

<i>Species</i>	6 a. m.		12 p. m.		6 p. m.		<i>Total</i>
	No.	%	No.	%	No.	%	
Largemouth bass	13	(10.5%)	93	(75.0%)	18	(14.5%)	124
Spotted bass	34	(17.2%)	134	(67.7%)	30	(15.1%)	198
Bluegill	125	(14.6%)	426	(49.6%)	308	(35.8%)	859
Redear sunfish	16	(16.2%)	60	(60.6%)	23	(23.2%)	99
Warmouth	4	(80.0%)	0	(0.0%)	1	(20.0%)	5
Black buffalo	31	(13.3%)	109	(46.8%)	93	(39.9%)	233
Smallmouth buffalo	7	(9.3%)	10	(13.3%)	58	(77.4%)	75
Bigmouth buffalo			3	(100.0%)			3
Carp sucker	213	(17.3%)	749	(60.7%)	272	(22.0%)	1234
Freshwater drum	529	(33.0%)	556	(34.7%)	517	(32.3%)	1602
Spotted sucker					1	(100.0%)	1
Gizzard shad	6	(6.9%)	58	(66.7%)	23	(26.4%)	87
Blue & Channel catfish	485	(75.4%)	103	(16.0%)	55	(8.6%)	643
Flathead catfish	4	(80.0%)			1	(20.0%)	5
American eel	1	(100.0%)					1
TOTAL	1468	(28.4%)	2301	(44.5%)	1400	(27.1%)	5169

During the operating period of 1955, 507 fish were tagged with a monel tag affixed to the operculum (Table 5). This was done to obtain some idea as to the movement of these fish after they enter the lake and information as to how many of these available size fish were harvested. The tags were returned on a voluntary basis. Of the 507 fish tagged, 21 fish tags (4.1%) were returned which is about average for the state tagging return on other projects. Two of these fish were caught below the spillway. The total number of bass, both largemouth and spotted, that used the fishway for the two seasons was 570. For a lake the size of Bistineau, 17,200 acres, this would only average out to .033 bass per acre. It is doubtful that the introduction of these few bass was of benefit to the local angler.

TABLE 5
FISH TAGGED DURING THE 1955 OPERATION OF THE LAKE BISTINEAU FISHWAY

<i>Species</i>	No. <i>Tagged</i>	No. <i>Caught</i>	% <i>Returned</i>	<i>Retraps</i>
Largemouth bass	78	4	5.1	2
Spotted bass	81	4	4.9	3
Bluegill	272	7	2.6	1
Redear sunfish	75	6	8.0	4
Warmouth	1	0	0.0	0
	507	21	4.1	10

From the tagging operation it was observed that approximately 2% of the tagged fish were retrapped in that structure, which would indicate that the fish were either washed back over the spillway or swam over the spillway

voluntarily and then re-entered the structure. All the fish were released into the lake near the spillway because it was thought that the fish should still be under the influence of a water current when they were released from the trap. The percentage of retraps is comparable with retraps reported by Schafer and Geagan (1958) in Lake Chicot, Louisiana.

It is interesting to note that the ratio of game fish—rough fish which is approximately 1 to 3 is directly opposite to that reported by Schafer and Geagan (1958) for Lake Chicot, Louisiana, which was approximately 4 to 1. However, the percentage (6.5%) of the available game fish was lower in Chicot Lake than the 37% available size game fish using the Lake Bistineau structure.

This reversal in game fish-rough fish ratio could be due to the difference in slope of the structures. While the Lake Bistineau slope is 1 to 5, the fishway on Lake Chicot has a slope of 1 to 10, which would tend to permit smaller fish to utilize the structure. This is substantiated by the results which show that only 6.5% of the game fish using the Lake Chicot structure were available size, while 37% of the game fish using the Lake Bistineau structure were available size.

It is the opinion of the authors that the fishway on Lake Bistineau is not a desirable structure as it provides little harvest for the angler and permits access into the lake of many undesirable fish.

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ACCESS NEEDS—A CONTRIBUTION TO A PANEL ON ACCESS AREAS

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To those of us who have been engaged in water resource planning it has long been apparent that the economic growth of the country would place demands upon the resource that would not be satisfied by single-purpose, single-project type of solutions. In this connection and along with all the other uses people make of water, it has been equally apparent that public use of these waters for outdoor recreation would come to occupy a place of substantial purpose in the planning process. It really has not mattered what our personal beliefs might be as to the relative importance of recreation, or whether the Federal Government has responsibility in the field—the fact is, that the overwhelming magnitude of public demand upon public waters is such as to make the recreation purpose inevitable.

Nation-wise I believe we can state that recreation does now occupy a place of substantial purpose in water resource planning. Not only are comprehensive, basin-wide, all-purpose studies being authorized and embarked upon with increasing frequency, but Federal law and policy and the policies of certain States now define a positive position for recreation in water resource development.

Furthermore, as we look at our best economic predictions of the future, and as we look at the record of increasing participation in water-connected recreation, I don't think we need to be particularly far-sighted to state that not only will single-purpose, single-project developments for water use become more rare, but that the position of recreation will be strengthened as time goes by.

So it seems to me that the basic problem we are faced with now that the position of recreation has been sketched out for us, is to develop a methodology that will fully support and defend the position of recreation as a purpose in the planning process. Professional people in outdoor recreation fields have been