FISHERIES SESSIONS

INITIAL FISH POPULATION CHANGES FOLLOWING IMPOUNDMENT OF WEST POINT RESERVOIR, ALABAMA-GEORGIA[a]

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Abstract: The species composition and relative abundance of fishes in West Point Reservoir, a main stem Chattahoochee River reservoir, changed after impoundment in 1975. Strong year classes of gizzard shad, threadfin shad, largemouth bass, black crappie, bluegill, brown bullhead, carp, bowfin, and many sunfishes were produced in 1975. Sixteen species disappeared from the present reservoir region; 11 were not collected after impoundment, and 5 others disappeared during the first year. Forty-three species were found in the reservoir 2 years after impoundment, of which 6 did not occur in preimpoundment samples from the West Point Reservoir region. By 1977 the dominant species were gizzard shad, threadfin shad, bluegill, redbreast sunfish, and black crappie.

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Intensive sampling of the fish population in the Chattahoochee River before and after impoundment of West Point Reservoir was conducted from January 1972 to September 1977. This was part of a continuing investigation of the fisheries and physicochemical characteristics of the reservoir. Fish populations in southeastern reservoirs are of interest because strong year classes of many species are commonly produced during the first year of impoundment. The first year class of largemouth bass, for example, grows rapidly, but after a few years the number of bass produced and the growth rate both decrease (Bennett 1970).

The relative abundance of most fish species changes as the habitat is altered from river to reservoir (Elrod and Hassler 1971, Fitz 1968, Gasaway 1970, Patriarche and Campbell 1958, Wahlburg and Nelson 1966). Some species disappear immediately and others may spawn successfully the first year, only to disappear later; some species, uncommon in the river become abundant in the reservoir. This study documents the species changes in West Point Reservoir during the first 2 years after impoundment.

MATERIALS AND METHODS

West Point Reservoir, a U.S. Army Corps of Engineers impoundment of the Chattahoochee River, extends from north of West Point, Georgia, (near the Alabama state line) to Franklin, Georgia. The reservoir lies just above the fall line in the Piedmont physiographic region. The reservoir was impounded in early 1975 and the lake level is normally maintained at 194 m above mean sea level except for a 3 m drawdown in winter. At the normal pool elevation, the surface area is 10,482 ha, the volume 745.6 million m^3, the shoreline length 845 km, and the average depth 6.4 m.

The composition of the preimpoundment fish population was described in detail by Shelton and Davies (in press). From January 1972 to May 1974 a total of 96 collections were made by seining, electrofishing, and rotenone sampling.

The study of the new reservoir began in the summer of 1975, after the reservoir had reached the normal pool level for the first time. Collections included: (1) 192 near-shore samples, each taken during 45 min of electrofishing (boat-mounted 110-volt AC generator and a pulsator which provided variable DC voltage); (2) 12 samples from coves treated with rotenone (average surface area, 0.8 ha) of which 2 coves were sampled 3 times each and 6 others, selected at random that were treated once; (3) 120 shoreline rotenone samples of 0.01 ha, each blocked off with a 0.5 cm mesh net 30.5 m long and

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2.7 m deep; (4) 45 overnight sets of experimental gill nets (monofilament nylon, 38 x 1.8 m, of 5 mesh sizes from 2.5 to 7.6 cm, bar measure); (5) 500 samples with a 0.3 cm mesh seine (1.2 x 3.7 m) and 250 samples with a 0.3 cm mesh bag seine (15.2 x 1.8 m).

Representatives of each species were deposited in the Auburn University ichthyological collection. Identifications were confirmed by J. S. Ramsey. Common and scientific names of fishes listed in Table 1 were those of Bailey (1970).

RESULTS AND DISCUSSION

Shelton and Davies (in press) reported 53 species of fishes in the West Point Reservoir area before impoundment. After impoundment 11 were not collected again, 5 disappeared during the first year, and 37 were found in the reservoir 2 yrs. after impoundment Table 1).

Table 1. Fishes collected in West Point Reservoir area, January 1972-May 1977.

Both Before and Two Years After Impoundment	
Common name	*Scientific name*
Longnose gar	*Lepisosteus osseus*
Bowfin	*Amia calva*
Gizzard shad	*Dorosoma cepedianum*
Threadfin shad	*D. petenense*
Chain pickerel	*Esox niger*
Undescribed chub	*Hybopsis* sp. cf. *H. winchelli*
Golden shiner	*Notemigonus crysoleucas*
Blacktip shiner	*Notropis atrapiculus*
Bluestripe shiner	*N. callitaenia*
Longnose shiner	*N. longirostris*
Red shiner	*N. lutrensis*
Weed shiner	*N. texanus*
Blacktail shiner	*N. venustus*
Quillback	*Carpiodes cyprinus*
Creek chubsucker	*Erimyzon oblongus*
Spotted sucker	*Minytrema melanops*
Greater jumprock	*Moxostoma lachneri*
Undescribed sucker	*M.* sp. cf. *M. poecilurum*
Snail bullhead	*Ictalurus brunneus*
Black bullhead	*I. melas*
Yellow bullhead	*I. natalis*
Brown bullhead	*I. nebulosus*
Channel catfish	*I. punctatus*
Mosquitofish	*Gambusia affinis*
Brook silverside	*Labidesthes sicculus*
Flier	*Centrarchus macropterus*
Redbreast sunfish	*Lepomis auritus*
Green sunfish	*L. cyanellus*
Warmouth	*L. gulosus*
Bluegill	*L. macrochirus*
Redear sunfish	*L. microlophus*
Spotted sunfish	*L. punctatus*
Spotted bass	*Micropterus punctulatus*
Largemouth bass	*M. salmoides*
Undescribed bass	*M.* sp. cf. *M. coosae*
Black crappie	*Poxomis nigromaculatus*
Yellow perch	*Perca flavescens*

Before Impoundment Only	
Bluehead chub	*Nocomis leptocephalus*
Highscale shiner	*Notropis hypsilepis*
Bandfin shiner	*N. zonistius*
Fathead minnow	*Pimephales promelas*
Creek chub	*Semotilus atromaculatus*
Lake chubsucker	*Erimyzon sucetta*
Alabama hogsucker	*Hypentelium etowanum*
Speckled madtom	*Noturus leptacanthus*
Southern studfish	*Fundulus stellifer*
Redeye bass	*Micropterus coosae*
Banded sculpin	*Cottus carolinae*
Before and After Impoundment but Disappearing After One Year	
Southern brook lamprey	*Ichthyomyzon gagei*
Redfin pickerel	*Esox americanus*
Stoneroller	*Campostoma anomalum*
Silverjaw minnow	*Ericymba buccata*
Blackbanded darter	*Percina nigrofasciata*
After Impoundment Only	
Goldfish	*Carassius auratus*
Carp	*Cyprinus carpio*
White catfish	*Ictalurus catus*
Dollar sunfish	*Lepomis marginatus*
Swamp darter	*Etheostoma fusiforme*
Walleye	*Stizostedion vitreum*

Six species not reported by Shelton and Davies (in press) have appeared in the reservoir (Table 1). They were probably not collected earlier because they were uncommon in the river and/or their habitat was difficult to sample adequately. Gilbert (1969) described the swamp darter and the dollar sunfish as rare in the middle Chattahoochee River region. Although uncommon, both have been collected in all parts of the reservoir and our postimpoundment collections extend their northern range in the river. Walleyes have been stocked in Lake Sidney Lanier and its tailwater, 183 river km upstream from the headwaters of West Point Reservoir (Dahlberg and Scott 1971). The single walleye collected by us can probably be attributed to those stocked fish. White catfish may not have been collected earlier because they were uncommon and it was difficult to sample adequately the deep pools in the river. Goldfish probably originated from ponds inundated by the reservoir or possibly as discarded bait minnows.

No carp were collected before impoundment, but they were known to be in the watershed. After impoundment the few carp present produced a strong 1975 year class. One 0.81 ha cove in the upper reservoir had 533 carp per ha (mostly young-of-the-year) in the summer of 1975. The average number of carp per ha decreased from 160 in 1975 to 37 in 1977, although the weight per ha was almost the same (Table 2).

Before impoundment redfin pickerel were common, but no chain pickerel were collected (Shelton and Davies, in press). However, one chain pickerel was collected by Gilbert (1969). The 2 species of pickerel spawned during the first year of impoundment. In the Yellowjacket Creek cove in 1975 there were 67 chain pickerel and 720 redfin pickerel per ha. An average of 249 redfin pickerel per ha were collected in 1975 from 4 cove samples. In 1976 and 1977 no redfin pickerel were found in rotenone samples. The disappearance of redfin pickerel in electrofishing samples is shown in Fig. 1. The chain pickerel prefers larger bodies of water than the redfin pickerel and usually replaces it in reservoirs (Crossman 1966).

Table 2. Estimated average number and weight of fishes per ha in coves of West Point Reservoir based on rotenone samples taken in 1975-77.

	1975		1976		1977	
Species	*No/ha*	*Kg/ha*	*No/ha*	*Kg/ha*	*No/ha*	*Kg/ha*
Gizzard shad	7,446	102.9	8,334	224.2	58,663	797.6
Black crappie	4,054	45.8	329	7.7	480	12.4
Golden shiner	1,712	14.8	35	0.7	24	0.4
Largemouth bass	1,533	34.2	195	15.7	134	8.4
Bluegill	1,342	28.3	3,031	23.4	21,773	47.5
Brown bullhead	1,274	30.1	334	20.3	68	4.9
Threadfin shad	1,002	8.6	3,035	10.1	1,914	12.1
Green sunfish	676	13.7	554	4.6	451	4.6
Warmouth	329	4.8	228	3.3	66	0.5
Flier	313	2.4	150	3.8	—[a]	—[b]
Redfin pickerel	249	5.0	0	0	0	0
Carp	160	25.6	20	14.0	37	25.3
Bowfin	116	24.7	19	4.6	1	2.2
Redear sunfish	99	1.7	121	2.4	51	1.5
Spotted sunfish	95	2.7	43	1.2	7	—[b]
Creek chubsucker	81	4.8	22	4.5	4	1.3
Yellow perch	57	1.0	11	0.5	131	0.4
Redbreast sunfish	46	2.6	319	3.9	677	8.8
Yellow bullhead	33	1.6	31	0.8	3	—[b]
Spotted bass	29	1.4	13	t	4	0.2
Channel catfish	22	8.7	22	4.2	23	3.5
Chain pickerel	20	1.4	2	0.5	0	0
Black bullhead	20	0.5	0	0	0	0
Quillback	11	12.8	0	0	0	0
Spotted sucker	11	11.5	—[a]	0.8	1	0.6
Others[c]	33	0.1	125	0.1	103	1.9
Total	20,763	391.7	16,973	351.3	84,615	934.1

[a]less than 1

[b]less than 0.1

[c]southern brook lamprey, longnose gar, stoneroller, red shiner, weed shiner, undescribed chub, greater jumprock, undescribed sucker, snail bullhead, mosquito fish, brook silverside, dollar sunfish, swamp darter, blackbanded darter

Four other species of fish found during the first full year of impoundment have not been collected since: southern brook lamprey, stoneroller, silverjaw minnow and blackbanded darter. These fishes would be expected to be in streams flowing into the reservoir and not altered by inundation.

Eleven species were collected before but not after impoundment (Table 1). Most were fishes usually found in streams with moderate current. We expect that these species still occur in streams flowing into the reservoir.

Thirty-seven species were collected both before impoundment and through 2 yrs after impoundment (Table 1). Gizzard shad had become the most important species in number and weight by 1975 (Table 2). By 1977 there was an estimated average of 58,663 gizzard shad per ha (797.6 kg/ha). Threadfin shad were increasing in number and the extreme winter of 1976-1977 did not set back the population much, even though large numbers of dead were observed in February 1977.

The important game fishes in the reservoir were largemouth bass, bluegill, black crappie and channel catfish. Largemouth bass produced a large year class in 1975 (990 to 2,075 bass and 21.9 to 43.6 kg per ha). The 1976 and 1977 year classes of largemouth bass were weak. The estimated average number of largemouth bass per ha in coves declined from 1,533 in 1975 to 195 in 1976 and to 134 in 1977. No redeye bass and only 2 of the undescribed "shoal bass" were collected in the reservoir. Occasional spotted bass were taken.

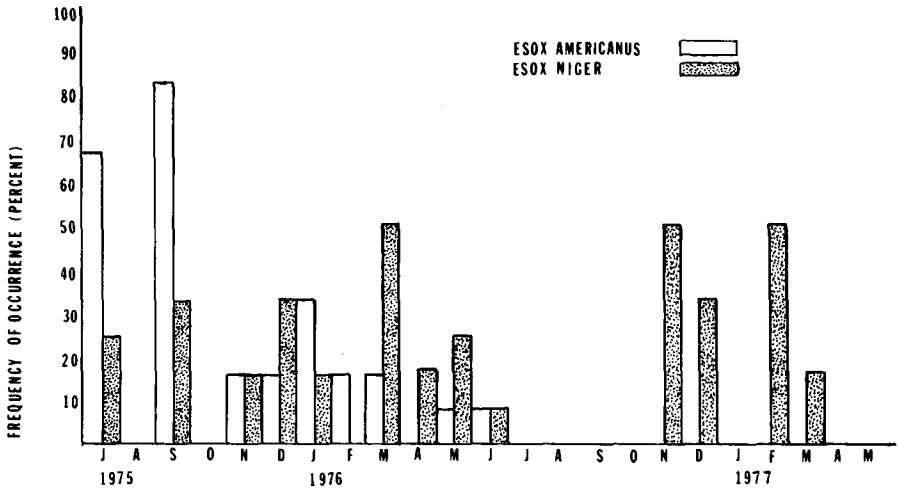

Fig. 1 Frequency of occurrence of pickerel in monthly electrofishing samples from July 1975 to May 1976 (192 samples—45 min of electrofishing/sample) in West Point Reservoir. Usually 6 samples/month from Sept. through March and 12 samples/month from April through Aug.

The black crappie was the second most abundant species numerically and by weight in 1975 (Table 2). It declined after 1975 but was still common in the 1977 samples.

The bluegill was abundant in 1975 and the average number and weight increased progressively from 1975 to 1977 (Table 2). The other species of sunfishes that were abundant in 1975 have declined in abundance: green sunfish, warmouth, flier, redear sunfish and spotteed sunfish (Table 2). Redbreast sunfish, however, have progressively increased in abundance.

Six catfishes were found in the reservoir. The brown bullhead was the most abundant. The 1975 year class was large and most of the brown bullheads sampled in 1977 were from the 1975 year class. The average estimated number per ha in rotenone samples declined from 1,274 in 1975 to 68 in 1977. Few channel catfish, white catfish, or snail bullheads were collected, except in experimental gill nets. These species are difficult to collect, since they apparently prefer deep holes in channels (McLane 1955).

The golden shiner was the third-most-abundant species in 1975, when there were 1,712 (14.8 kg) per ha. Samples in 1976 and 1977 suggested a marked decline in abundance (Table 2). Other cyprinids, except carp, were uncommon. In 1977 the golden shiner, weed shiner, blacktail shiner and red shiner were occasionally taken from samples near shore.

Five species endemic to the Apalachicola River drainage were collected in the study area before impoundment. The highscale shiner was not collected after impoundment. The undescribed "grayfin redhorse" and the greater jumprock were uncommon in the reservoir. The bluestripe shiner and the undescribed "shoal bass" were uncommon in the reservoir, both have been listed as species of special concern by Ramsey (1976). Only juveniles of the shoal bass have been collected in the study area since impoundment.

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