WATERFOWL USE OF CREEKS, BEAVER SWAMPS, AND SMALL IMPOUNDMENTS IN LEE COUNTY, ALABAMA [1]

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INTRODUCTION

Prior to the establishment of the Wheeler National Wildlife Refuge in northern Alabama, the Mobile Bay area was the only well known waterfowl area within the state. The results of T. V. A. flooding and the subsequent waterfowl management in the Tennessee Valley are well known and have contributed to the recent increase of interest in waterfowl in the state.

Barkalow (1949) estimated that approximately 80 percent of Alabama's wintering waterfowl were found in the Mobile Bay and the Tennessee Valley areas. He reported few waterfowl for the remainder of the state except along major rivers, which ducks and geese frequented mostly during peak migration periods.

Lack of sufficient high quality waterfowl habitat is the main limiting factor on waterfowl populations in central Alabama, but the situation has changed in recent years. Actual and potential waterfowl habitat in the nature of large impoundments, beaver swamps, and private ponds has greatly increased since the 1920's. Between 1920 and the fall of 1955 seven large power and navigation reservoirs aggregating 68,200 acres and ranging in size from 500 to 40,000 acres were built in central Alabama.

Beaver, which were scarce during the 1920's and 1930's have greatly increased in central Alabama (Fig. 1). Moore and Martin (1949) estimated a five-fold increase of the state beaver population between 1942 and 1948.

The building of farm fish ponds has increased greatly within the past 20 years. Swingle (personal communication) estimates that there were 700 ponds in Alabama in 1934, and by October, 1954, there were 11,852. Central Alabama has more ponds than any other section of the state.

There is some good waterfowl habitat along the major rivers and their flood plains, especially along the Alabama and Tombigbee Rivers. Minor rivers and major creeks of which Alabama has about 6,942 miles (Swingle, 1955) make up some habitat which is commonly overlooked by hunters.

With the idea of obtaining information basic to future management in central Alabama, the writer studied the seasonal and relative abundance of waterfowl on sample areas of small impoundments, creeks, and beaver swamps in Lee County, Alabama during 1953 and 1954.

In addition to seasonal and relative abundance of waterfowl, the different types of habitats that were studied were evaluated; and some duck stomachs were examined to determine food preferences. It is believed that information gained in this study will be applicable to areas in Alabama and other southern states having similar water conditions.

Lee County seems to be fairly representative of central Alabama (insofar as waterfowl habitat is concerned) south of the Appalachian Mountain region. This county is probably more suitable for waterfowl than some of the counties that are not within 20 to 30 miles of some large reservoir. However, it is not as good as some south-west-central counties adjacent to large rivers and con-

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taining large swamps and many ponds. Lee County ranks high among Alabama counties in numbers of ponds and numbers of beaver, and is adjacent to reservoirs of large size, which however, are not very attractive to waterfowl except as resting areas.

PROCEDURE

Beginning on October 24, 1953, and continuing to January 22, 1955, a total of 524 observations was made on the waterfowl populations of special study areas in Lee County, Alabama. Most of the observations were made on foot with the aid of binoculars. The following types of habitat (Table I) were studied: (1) a 58-acre pond where summer drawdown management for waterfowl was being practiced and hunting was allowed one day a week; (2) a 260-acre lake where no waterfowl management was practiced, and a restricted number of people could hunt at any time; (3) a 20-acre lake unsuitable for waterfowl management practices and where no hunting was allowed; (4) a 25-acre area of unmanaged beaver swamp in which for all practical purposes, hunting was unrestricted; and (5) four segments of creek habitat having average widths ranging from 77 to 29 feet and ranging from severely polluted to unpolluted. Hunting pressure was uniformly light on the creek areas.

With few exceptions, a weekly census was made of all eight sample areas. Trips were made at all hours of the day—from daylight until dark. When it became evident that waterfowl were not using a particular area during a certain time of day, most subsequent trips to that area were made at a different time. Some additional trips were made to the beaver swamp area in late winter of 1954 and fall of 1954 to count ducks as they came in to "roost."

A general habitat evaluation was made based on important plant species, as determined by visual inspection, and on certain physical features of the areas. Some data on food habits were secured from examination of stomach contents of 23 birds collected by shooting, and from observations on feeding.

RESULTS

Relative Abundance

A total of 6,816 waterfowl of 19 species was seen (Table II). The top five species in order of abundance were as follows: (1) ring-necked duck, (2) common mallard, (3) wood duck, (4) American coot, and (5) scaup duck. Black ducks and blue-winged teal were seen in fair numbers during certain short periods. The wood duck was the only locally breeding species observed.

Nineteen species of waterfowl were noted during fall migration, although only seven could be classed as common (Table III). During the spring ten species of waterfowl were observed (Table IV).

Seasonal Abundance

During the 1953-54 season observations were made from October 24, 1953, until the end of the spring migration, and throughout the summer. The month of November was the month of highest waterfowl populations, after which a rapid decline occurred. The duck population remained low until the last two weeks of January, when a large increase occurred. A fairly large number of ducks were found on sample areas throughout February, after which time the numbers steadily decreased until the end of spring migration. Water levels and available food were apparently normal (as they had been in recent years) during this season.

During the 1954-55 season observations were made from the beginning of the fall migration through December 15. Observations were continued into January at two key impoundment areas (Whatley's Lake and Lake Ogletree). November was again the month of highest population for the fall migration but the total waterfowl population was less than half as large as for November, 1953, and the January, 1955 population on the two key areas was more than twice as large as the November, 1953 population. The big difference here involved mostly ring-necked ducks at Whatley's Lake and Lake Ogletree. The extremely low population observed during the fall of 1954 appeared to be due chiefly to the drought and the resulting unavailability of duck food. The sudden appearance of large numbers of ring-necks in January, 1955 seemed to be due

TABLE I
COMPARISON OF SAMPLE AREAS OF WATERFOWL HABITAT

Sample Area	*Size (Acres)*	*Abundant Waterfowl Foods Under Normal Conditions*	*Hunting Pressure*	*Nov. Population (1953 and 1954) Ave. No. Waterfowl Seen Per Trip/10 A.*	*Observed Value as "Roost" Site*	*Observed Value as Nesting and Rearing Territory*
Whatley's Lake	58	Naiad Wild millet Bullgrass Largeseed smartweed Dotted smartweed	Well regulated	18.7	Slight for wood ducks in October	None
Lake Ogletree	260	Practically None	Partially regulated	0.8	None	None
Lake Chewacla	20	None	None	0.5	None	None
Chewacla Beaver Swamp	25	Big duckweed Rice-cutgrass Dotted smartweed Southern smartweed Duck Potato Panic grasses Arrow arum	Excessive	9.0*	High exceeded day use in fall and late winter.	High for wood ducks. One brood per five acres.
Lower Sougahatchee Creek	Length, 1 Mile Average Width, 77 Feet	Water oak American hornbeam Beech Snails Aquatic insects Mast index—344**	Recovered***	Very light	19.0† None	None

Sample Area	*Size*	*Abundant Waterfowl Foods Under Normal Conditions*	*Organic Pollution*	*Hunting Pressure*	*Nov. Population (1953 and 1954) Ave. No. Waterfowl Seen Per Trip/Mile*	*Observed Value as "Roost" Site*	*Observed Value as Nesting and Rearing Territory*
Lower Chewacla Creek	Length, 1.7 Mile Average Width, 43 Feet	Water Oak American hornbeam Beech Snails Mast index—129	None	Very light	1.4	None	None
Upper Sougahatchee Creek	Length, 1.5 Mile Average Width, 29 Feet	Water oak American hornbeam Beech Pollutional organisms Mast index—120	Extremely polluted	Very light	0.6‡	None	None
Upper Chewacla Creek	Length, 1.7 Mile Average Width, 30 Feet	Water oak American hornbeam Beech Snails Mast index—91	None	Very light	1.0	None	None

* Does not include figures for late evening and night, which exceeded daytime figures.
** Mast index—No. of water oak and beech trees 30 feet or less from banks, and of 8" or more in diameter/mile of creek.
*** The creek here is about 20 miles below source of pollution. The water is clear and game fish are present.
† At this density of population good jump shooting is possible.
‡ At this sample area the month of highest population was February. In February, 1954, the average number ducks seen/trip/mile was 9.0. On all other sample areas November was the most important month.

to flooding of hitherto unavailable food plants that were accidentally produced as a result of the previous summer's drought.

TABLE II

SPECIES AND NUMBERS OF WATERFOWL SEEN ON THE SAMPLE AREAS FROM OCTOBER 24, 1953 THROUGH DECEMBER 15, 1954

Species	*Whatley's Lake*	*Lake Ogletree*	*Lake C'wacla*	*Chewacla Swamp**	*Soug. Creek Lower*	*Soug. Creek Upper*	*Chewacla Creek Lower*	*Chewacla Creek Upper*	*Total*
Ring-necked duck	2,878	211	1	..	..	..	..	..	3,090
Common mallard	578	135	2	273	133	138	2	..	1,261
Wood duck	127	6	..	455	64	14	59	12	737
American coot	377	153	1	8	..	..	..	..	539
Scaup duck	490	46	2	..	..	..	..	..	538
Blue-winged teal	233	135	..	24	..	2	..	..	394
Black duck	35	3	..	4	31	3	8	..	84
Green-winged teal	16	1	..	12	1	..	..	..	30
Hooded merganser	1	6	2	..	11	..	..	..	20
Shoveller	9	6	..	..	..	..	..	..	15
Buffle-head	12	..	..	..	..	..	..	..	12
Ruddy duck	11	..	..	..	..	..	..	..	11
Redhead	10	..	..	..	..	..	..	..	10
Canvas-back	1	6	..	..	..	..	..	..	7
Baldpate	2	4	..	..	..	..	..	..	6
Gadwall	4	1	..	..	..	..	..	..	5
American pintail	1	3	..	..	..	..	..	..	4
Blue goose	4	..	..	..	..	..	..	..	4
American merganser	..	1	..	..	..	..	..	..	1
Unidentified	10	36	..	..	2	..	..	..	48
TOTAL	4,799	753	8	776	242	157	69	12	6,816
TOTAL TRIPS	92	82	57	55	49	55	52	57	500

* Night populations are not included.

TABLE III

FALL MIGRATION DATA FOR WATERFOWL

Species	*Fall, 1953 (Oct. 24-Nov. 30) Date First Seen*	*Main Peak*	*Fall, 1954 (Sept. 1-Nov. 30) Date First Seen*	*Main Peak*
Ring-necked duck	Nov. 2	Nov. 1-15	Nov. 11	Scarce
Scaup duck	Oct. 28	Nov. 1-15	Nov. 5	Scarce
Wood duck	RA*	Nov. 1-15	.....	Nov. 1-15
Common mallard	Oct. 31	Nov. 16-30	Oct. 29	Nov. 16-30
Black duck	Nov. 9	Nov. 16-30	Nov. 15	Scarce
American coot	Oct. 28	Nov. 16-30	Oct. 7	Nov. 16-30
Blue-winged teal	.....	.....	Aug. 30	Oct. 1-15
Green-winged teal	.....	.....	Nov. 5	Scarce
Hooded merganser	Nov. 29	Scarce	Nov. 15	Scarce
Shoveller	Oct. 31	Scarce	Oct. 13	Scarce
Buffle-head	Nov. 26	Scarce	Nov. 27	Scarce
Ruddy duck	.....	.....	Nov. 11	Scarce
Redhead	Oct. 30	Scarce	Nov. 8	Scarce
Canvas-back	Oct. 28	Scarce	Nov. 16	Scarce
Baldpate	Oct. 28	Scarce	Nov. 6	Scarce
Gadwall	.....	.....	Nov. 17	Scarce
American pintail	.....	.....	Oct. 7	Scarce
Blue goose	Nov. 6	Scarce	Nov. 11	Scarce
American merganser	.....	.....	Nov. 29	Scarce

* Resident year around.

HABITAT TYPES COMPARED

Waterfowl populations varied in their species make-up according to habitat. On impoundments ring-necked ducks comprised 55 percent of the population observed. Mallards made up 12 percent, and scaups, 10 percent.

In Chewacla swamp, wood ducks comprised 59 percent of all waterfowl observed. Mallards made up 35 percent of the total swamp population.

TABLE IV

SPRING MIGRATION DATA FOR WATERFOWL *

Species	*Date Last Seen*	*Main Peak*
Common mallard	Mar. 29	Jan. 16-31
Wood duck	RA**	Jan. 16-31
Scaup duck	Mar. 16	Feb. 1-15
Ring-necked duck	Mar. 29	Feb. 16-28
Blue-winged teal	.....	Mar. 16 31
American coot	.....	Apr. 1-15
Black duck	Mar. 1	Scarce
Green-winged teal	Feb. 26	Scarce
Hooded merganser	.....	Scarce
Shoveller	Mar. 22	Scarce

* The high populations which occurred in winter were probably composed of late migrants from the north, local populations, and north bound migrants.
** Resident year around.

On creeks the mallard predominated, comprising 52 percent of the total population. Wood ducks were second, making up 31 percent, and black ducks were third with 9 percent.

The beaver swamp received more waterfowl use acre per acre than the other sample areas, when year around day and night use is considered (Fig. 2).

The 58-acre impoundment which was managed for waterfowl received about 90 times more waterfowl use than did the 20-acre impoundment which was almost devoid of waterfowl food, but which was an inviolate refuge.

With an increase in the average width of creeks and also an increase in abundance of mast, the creek waterfowl population rose. A sample area which averaged 77 feet in width and which was bordered by abundant mast trees provided good hunting. An average November population of 14.7 ducks per mile in 1953 and 25.5 ducks per mile in 1954 (mostly mallards and black ducks) was found per trip on this area.

Severe organic pollution did not prevent ducks from using a creek during the winter after the first heavy rains. In fact, two other unpolluted creek sample areas of slightly larger average width and with mast being about equally abundant were used less by ducks (Fig. 3).

Beaver swamps provided both day and night habitat, and seemed to provide a center from which mallards and wood ducks scattered along the creeks to feed during the morning. Very few ducks used the ponds or creeks at night.

NESTING

Chewacla beaver swamp was the only sample area at which ducks were found nesting in 1954. The first brood of downy young wood ducks was seen in the swamp on April 9, and the latest downy young brood was observed on June 30. On May 21 and June 10 four separate broods of young were seen, which indicates that at least five broods of wood ducks were hatched in or near the 25 acres of swamp. Young wood ducks were aged by means of the field method reported by Dreis (1954), and the probable hatching time for four of the five broods fell within the period between April 1 and May 7.

Between April 9 and May 15, the average number of ducklings per brood was 8.7. During the last half of May, the average was 5.7, and for the month of June the average number of ducklings per brood was 3.6.

The first "flying young" wood ducks were seen on June 10, and by the first week of July all of the wood ducklings seen except one brood were approximately the size of the adult hen and could fly well.

FOODS TAKEN

Observations on feeding, and examination of stomach contents of 23 surface-feeding ducks from all habitat types revealed that ducks were eating the following items: dotted smartweed, American hornbeam, large-seed smartweed, rice-cutgrass, big duckweed, acorns and snails. Item taken in smaller quantity included various fruits of woodland trees, shrubs and vines, and aquatic insect larvae.

DISCUSSION

Information from this study indicates that a significant number of ducks and coots can be attracted to Lee County, Alabama, and that the following species: (1) ring-neck, (2) mallard, (3) wood duck, (4) scaup and (5) black duck will winter here if their requirements are met. A great deal will have been accomplished toward this end if the quality of existing wetlands is improved.

It is likely that a large part of central Alabama and perhaps parts of surrounding states are similar to Lee County in their waterfowl potentialities.

An ideal management arrangement for the region might be (1) public waterfowl development on large reservoirs where conditions permit (some of this development should be in refuges and some in public hunting areas), (2) public development of scattered beaver swamps of sufficient size to serve as refuges, (3) private management of beaver swamps and farm ponds or "wildlife" ponds and, (4) the leaving of approximately 250 to 350 suitable mast trees per mile of creek used by ducks.

There are many obstacles in the way of such ideal management. In the first place, most of the large reservoirs of central Alabama are attractive to waterfowl as resting areas only. The nature of the margins, water fluctuations, and/or silting make significant waterfowl food production impossible, except for very limited areas. We can expect only limited public waterfowl development on these large reservoirs, but this can be supplemented by small area management nearby. An exception is the new Demopolis Lake scheduled for completion in 1955. Beshears (1955) states "there will be excellent possibilities for waterfowl development on this area."

If we assume that ducks have a daily cruising range of about 25 to 30 miles (Bellrose, 1954) then all parts of Lee County are within the daily cruising radius of a large impoundment with enough open water to serve as a natural refuge. Local ponds, lakes, creeks and beaver swamps provide feeding grounds. Pond development for ducks may be practical only within the theoretical "daily cruising radius" of large impoundments and along major rivers; or it may be possible to hold ducks in an area similar to Lee County with only managed beaver swamps and ponds of sufficient size and quality. At present only a few farm fish ponds offer anything but resting sites for ducks. Considerable research has been conducted elsewhere, and good techniques have been developed for management of waterfowl on small areas such as farm ponds. However, there seems to be a lack of effort at popularizing such methods where they are applicable and they appear to be suitable on some ponds as small as 50 acres in Lee County, Alabama.

The possibilities for both reasonable fish production and waterfowl management at the same pond should be investigated. In some cases small impoundments, primarily for waterfowl could be built.

At this time, judging by beaver habitat conditions in Lee and Macon Counties, Alabama, the central Alabama beaver swamps are very attractive to mallards and wood ducks. Management through water manipulation, trapping of beaver, weed control and planting of food plants would pay dividends. Management of beaver swamps for dabbling ducks appears to offer better possibilities than does management of small ponds of the usual type. Beaver swamps have the following advantages over ponds: (1) they serve as "roosts" for ducks and probably hold them in local areas, (2) they provide good hatching and rearing areas for wood ducks, (3) their great variety of vegetation due to the intermixture of various successional stages provides a wide variety of natural foods.

A recent study (Beshears, 1955) found seventeen water areas that were suitable for waterfowl development by the State. Most of these areas are in central Alabama and if they are supplemented by private developments, we might have enough habitat to attract and hold a regular winter waterfowl population. The duck population of the inland part of the state would increase and people would get to shoot ducks who would otherwise have to go a considerable distance to do so. The increase in wintering ground habitat would serve as insurance for the future.

SUMMARY

Studies on eight sample areas of small impoundments, swamps, and creeks in Lee County, Alabama between October, 1953 and January, 1955, indicated a relative abundance of the more important waterfowl as follows: (1) ring-necked duck, (2) mallard, (3) wood duck, (4) coot, (5) scaup. The ducks in general showed a fall migration peak during the first half of November in 1953 and in the latter part of the month in 1954.

Several species of ducks exhibited a definite habitat preference. On small impoundments ring-necked ducks predominated, on creeks mallards were most abundant and on a beaver swamp wood ducks outnumbered all others.

Although 19 species of waterfowl were observed on the areas, only the wood duck was a summer resident. Five broods, four of which probably hatched between April 1 and May 7 were observed.

It was concluded that the first and most important step in future waterfowl management in central Alabama would be improving the quality of existing wetlands.

The present as well as the future role of creeks, small impoundments, and beaver swamps in waterfowl management is discussed.

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THE ECONOMIC STATUS OF NUTRIA IN LOUISIANA

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INTRODUCTION

Nutria have been present in the coastal marshes of Louisiana since 1937, when they escaped from confinement on the late E. A. McIlhenny Estate at Avery Island, Louisiana.

The animals which found the Louisiana marshes a very favorable habitat reproduced prolifically and are at the present time our leading fur producer. Since the nutria was new and the price of pelts rather high following World War II, many of the animals were introduced to marshes, lakes, and farm ponds from Mississippi to Texas and other states.

As the population continued to increase, the nutria extended their range to the north and are now common in the rice and sugar cane belt of the State. It is in this area where the greatest damage has been caused by nutria.