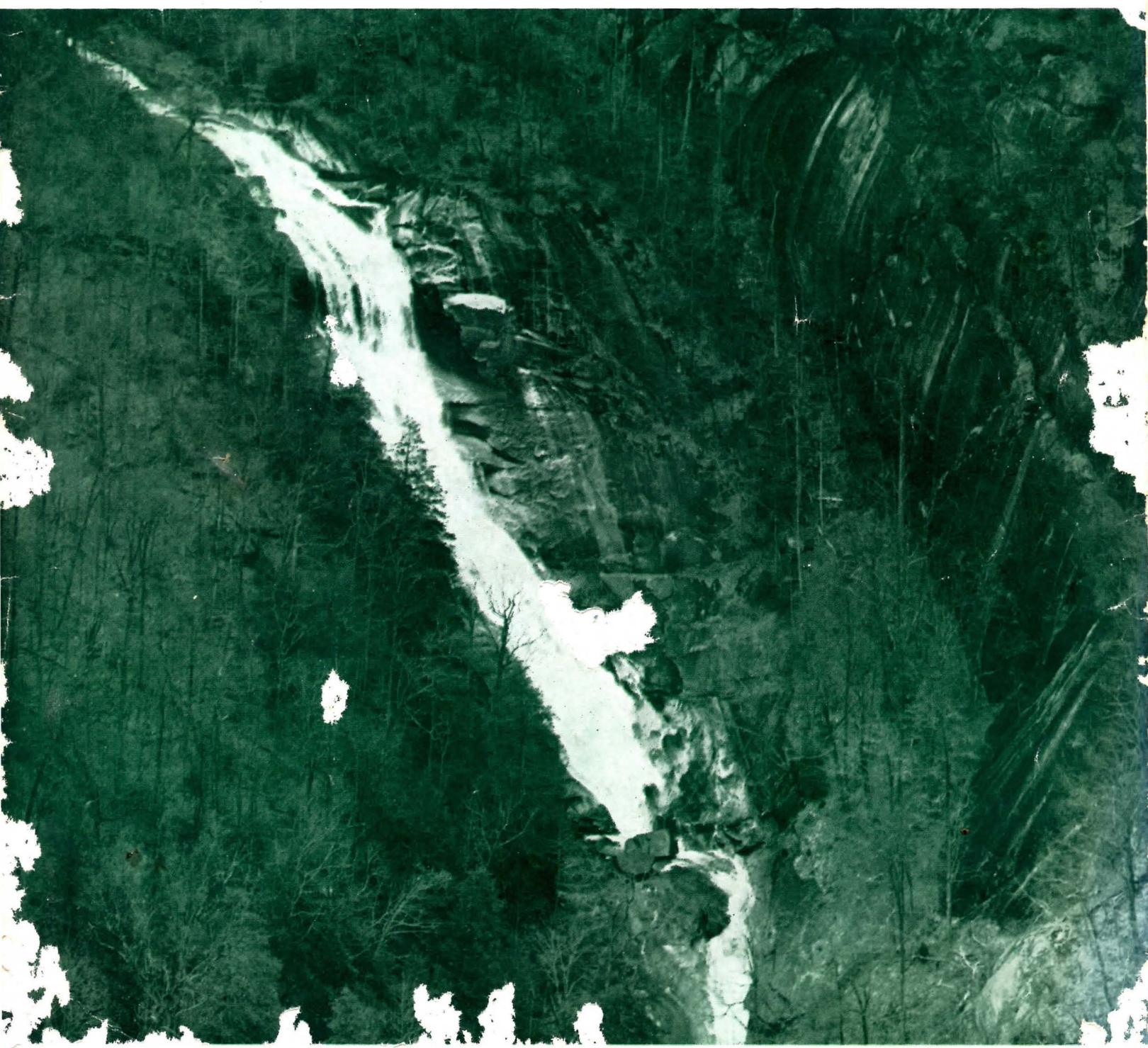


*South
Carolina*

WILDLIFE

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DEDICATED TO THE
*Conservation, Protection and Restoration of Our Game
and Fish and to the Education of Our People to the
Value of Our Natural Resources*

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THE COVER

Here's one of South Carolina's most scenic and most overlooked beauty spots—Whitewater Falls in northern Oconee County. These are the lower falls, the upper falls being across the line in North Carolina. There's a fairly good road to the lower falls. (Photo by Buehler.)

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Boating Boom

Several years ago I was talking with a fellow who lived in a heavily populated section of Ohio and he mentioned a lake near his home, the only body of water of any size in some distance. He said that on weekends this lake was so crowded that all boats would have to go in the same direction in a steady procession round and round the lake at a fairly uniform speed.

At the time of our conversation—a weekday—we were cruising around the 60,000 acres of Lake Moultrie, almost entirely open water suitable for fishing, cruising or skiing. Another boat was trolling about a quarter mile away and by standing up and using the field glasses you could probably have spotted a dozen boats on the lake. And the fellow from Ohio kept repeating; "I just can't believe it. A pretty day and a pretty body of water and no more people taking advantage of the opportunity to be out of doors on the water."

The number of boats on Lake Moultrie has now increased, as it has on all waters of the State, but luckily the water traffic has not yet reached the stage that the fellow from Ohio mentioned. But if you want to read some astounding figures on the growth of boating, look over a report from the Outboard Boating Club of America.

In the 1963 report it was estimated that \$2,581,000,-000 was spent on boats, motors, trailers, accessories, fuel, insurance, docking, launching, storage, maintenance and repairs. An estimated 38,390,000 persons went boating on a more-than-casual basis in 1963, an increase of more than a million over 1962.

The report placed the number of recreational craft of all types in use on the nation's waterways at 7,678,000, compared to 7,468,000 in 1962. The report shows the following figures: 813,000 inboard boats, including auxiliary-powered sailboats; 4,239,000 outboard boats; 495,000 sailboats without auxiliary power; and 2,131,000 rowboats, canoes, dinghies and other miscellaneous craft. (The number of boats requiring registration under the Federal Boating Act of 1958 was estimated at 4,624,834, compared with 4,515,458 in 1962.) Wonder what the saturation point is?

—E. F.

A Review of Commission Accomplishments



Former Governor James F. Byrnes and Mrs. Byrnes are shown above enjoying the annual barbecue given by the late George Warren, first chairman of the Wildlife Resources Commission, at his home in Hampton. Senator Warren stands behind the Byrnes. (Photo by Brown.)

Signing of Commission Bill Pleased Byrnes

James F. Byrnes has held some of the highest offices the nation could bestow but none he prized more highly than the governorship of South Carolina. As governor he signed important pieces of legislation but one that he says gave him particular pleasure was that setting up the Wildlife Resources Department.

The fact is that without his influence the Bill would not have been passed by the General Assembly, for supporters and opponents of the measure had become embittered by several

Twelve years have passed since the 1952 General Assembly approved Plan Eight, which consolidated the office of the Chief Game Warden, the State Board of Fisheries and Bears Bluff Laboratories into the Wildlife Resources Department, with the seven-man Wildlife Resources Commission as the governing body of the new agency. The Department now consists of the Division of Game and Fish, the Division of Commercial Fisheries, Bears Bluff Laboratories and the Division of Boating, the last established in 1960. A review of the progress made since 1952 might be in order.

The legislation setting up the Commission had provided that Chief Game Warden A. A. Richardson, who had served since 1913, continue in office as Director of the Division of Game and Fish. He did so until his retirement in 1959, when he was succeeded by James W. Webb, who had been Assistant Director.

Dr. G. Robert Lunz, Director of Bears Bluff Laboratories since 1946, was also named Director of the Di-

years of controversy over the proposed legislation.

Mr. Byrnes, who has never hunted but who has fished whenever his busy schedule has permitted, said recently that he felt he "was doing something for the people of South Carolina when I signed the Bill. I know the value of outdoor recreation and the pleasure people get from hunting and fishing. I knew that with our growing population and our steadily decreasing supply of available land that something would have to be done to preserve our wildlife resources and to provide our people with places to hunt and fish. I am particularly pleased that the Commission embarked on such a program. I know it's hard to provide land for hunting but any land provided now will become more and more valuable as time passes."

vision of Commercial Fisheries in 1959, succeeding Alonzo B. Seabrook. The consolidation of these positions within the Department was made possible under an act of the General Assembly. (A story on the progress of the Division of Commercial Fisheries and Bears Bluff Laboratories will be carried in a later issue of this magazine.)

Four of the original Commissioners appointed by Governor Byrnes are still serving; Edwin W. Johnson of Spartanburg, the present chairman and member-at-large; Edward B. Cantey of Columbia, Second District; J. Drayton Hopkins of Simpsonville, Fourth District; and R. A. Oliphant of Chester, Fifth District.

One of the first actions of the new Commission was to secure the services of the Wildlife Management In-

stitute to make a thorough study of the existing setup and make recommendations, many of which were subsequently adopted.

Among the improvements in the law enforcement setup have been:

Setting up standards for the employment of new wardens and establishment of a merit system, along with improved salaries;

Training wardens in first aid, boat safety and gun safety;

Working with other divisions in game and fish surveys, trapping and restocking, and cooperating in the management of public hunts;

Setting up five law enforcement districts with a supervisor over each and subsequently the naming of a chief of law enforcement;

Putting the wardens in uniforms and setting up a radio system, which

now has a plane working in cooperation with it;

Holding an annual training school and also regular district meetings;

And finally, stressing the Commission's belief that the best possible relations should be maintained with the public.

Research and management programs carried out largely under the federal aid program, some of which had already been started under the old setup, have included:

The very successful stocking of deer and turkey upstate which has resulted in excellent hunting during the special seasons;

The building of public fishing ponds, mainly in upstate areas where there was little good water for public fishing;

(Continued on page 9)

The Wildlife Resources Commission

EDWIN WALLACE JOHNSON

Spartanburg

**Chairman and Commissioner
At-Large**

One of the original members of the Commission, the Spartanburg attorney was vice-chairman until the death of Chairman George Warren in 1961. He attended Wofford, The Citadel and the University of South Carolina.

Mrs. Johnson is the former Eppes Jones and they have two daughters.

Mr. Johnson is a member of a number of business and professional societies, including the following: American Bar Association; National Association of Claimants Counsel of America; S. C. Bar Association; S. C. Plaintiffs Attorneys' Association; Spartanburg County Bar Association, Past President; Former City Attorney of City of Spartanburg; Former State Committeeman NACCA Bar; Member Board of Governors NACCA Bar Association (1963-65); Chairman of S. C. Bar Association Committee on Procedure and Law Reform; Chairman of Special Committee on Redrafting Probate Laws of S. C.; Member of Judicial Council of S. C.;

Past Exalted Ruler, Past District Deputy, Honorary Life Membership Spartanburg Lodge No. 1310 B. P. O. E.; Past President of Spartanburg Lions Club; Past District Governor Lions International; Kappa Alpha Fraternity.

His hobbies are hunting and fishing and fishing and hunting.





OSBORN B. HEYWARD

Charleston

First District

"Buddy" Heyward was born in Charleston where he attended the public schools and The Citadel. Mrs. Heyward is the former Hazel M. Smith and they have two sons. He is the owner of Heyward Supply Company, dealer in marine equipment and accessories.

He belongs to the Charleston Country Club, the Elks Club, Carolina Yacht Club, Chamber of Commerce, Charleston Development Board and is past senior warden of Grace Episcopal Church.

His hobbies are golf, bird hunting, skeet and pistol shooting.

EDWARD B. CANTEY

Columbia

Second District

"Major" Cantey gets his title from the rank he held with the AEF in France in the First World War, being in charge of a machine gun outfit. Born in Camden he married Helen Robertson and they have two sons and two daughters. He attended public schools in Camden and three years of private and business schools.

He retired from the securities business in 1958. He is a member of the American Legion and Sons of the American Revolution.

His hobbies are hunting and fishing.



JOSEPH WILLIAM COX

Johnston

Vice-Chairman

Third District

PLACE OF BIRTH: Johnston, South Carolina

MAIDEN NAME OF WIFE: Margaret Preston Youmans

NUMBER AND SEX OF CHILDREN: None, but we have grandchildren

SCHOOLS ATTENDED: Little

BUSINESS OR PROFESSION: Country Lawyer

MEMBERSHIP IN SOCIETIES, FRATERNAL ORDERS, SERVICE CLUBS, ETC.: Several

HONORARY POSITIONS AND OFFICES: Few

HOBBIES: Hunting, fishing and domestic gaming

Dear Eddie

You are relieved of any responsibility for the above.

/s/ J. W. Cox.

3/12/64.



JOHN DRAYTON HOPKINS

Simpsonville

Fourth District

Drayton was born in Simpsonville. He and Mrs. Hopkins, the former Betty Agnew, have four children, two boys and two girls. He received his A.B. from Furman University and did postgraduate work at Duke University.

He is a farmer in cotton and grain and also a raiser of beef cattle.

He is a Mason and a member of the Pi Kappa Phi fraternity. He is past president of both the Greenville County Farm Bureau and the Greenville County Beef Cattle Producers Association; served as chairman of the Greenville County Agricultural Committee and is director of the S. C. Farm Bureau; and is listed in Marquis' WHO'S WHO IN THE SOUTH AND SOUTHEAST.

His favorite sport is hunting quail behind a good dog but he enjoys all types of hunting and fishing, and spectator sports—football, basketball and baseball.

**SIDNEY SMITH TISON**

Bennettsville

Sixth District

Mr. Tison was born in Guyton, Ga., although he comes from a family long connected with South Carolina History. In fact, Belmont Place—one of the Department's management areas—was originally owned by the Tison family on a grant from the King of England.

Mrs. Tison is the former Helen Darby and they have one son and two daughters.

He attended The Citadel. He has practiced law in Bennettsville for some years and from 1933-1953 was solicitor of the Fourth Judicial Circuit.

He lists his hobbies as fishing and hunting.

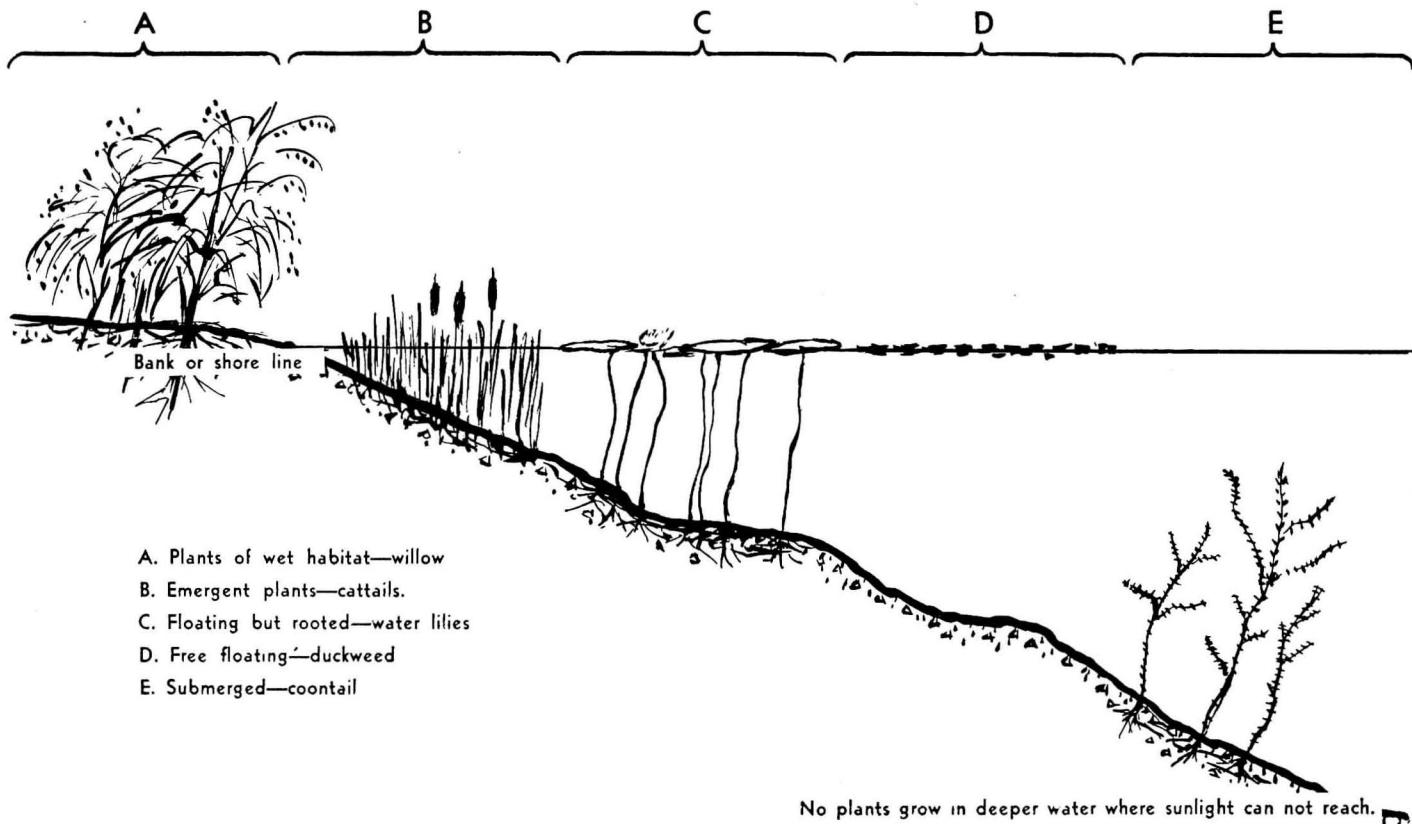
RUFUS ALEXANDER OLIPHANT
Chester**Fifth District**

Born in Spartanburg, "Alex" Oliphant attended Union High School, Clemson College and Northwestern University. He is married to the former Sarah Pryor. Their only son, a B-24 bomber pilot, died in the Second World War.

Mr. Oliphant is a farmer, fertilizer manufacturer, cotton merchant and warehouseman. He is a Mason, Elk and Moose and is a charter member of the Chester Rotary Club. He is also a member of the Chester Airport Commission.

His hobbies include fishing and the breeding of race horses, trotters and pacers.





Control of Aquatic Plants Big Problem

By JOE LOGAN
Fisheries Biologist

An aquatic plant is any plant growing entirely in water or in a wet habitat—and in the opinion of the average fisherman rates somewhere between a snapping turtle and a water moccasin in desirability. They are broken down into several categories, the drawing above showing their locations.

Sunlight is necessary for the growth of these plants and they are not found in water too deep for light penetration.

Despite the low regard in which aquatics are held by fishermen, they may be either harmful or beneficial, although the beneficial aspects are less noticeable. Beneficial aspects are:

1. They provide food for fish and wildlife, and therefore indirectly for man.
2. Through the exchange of carbon-dioxide and oxygen they maintain chemical balance in the water.

3. Some of them have esthetic value, notably water lilies.

4. Some of them provide shelter and cover for wildlife and young fish of desirable species.

5. Their shade may control undesirable weedy species.

6. They play a part in soil stabilization.

7. Some of them are sources for drugs and chemicals, notably iodine.

Harmful aspects are:

1. Clogging of ponds, canals and drainage ditches.

2. Off-flavor and odor of municipal water supplies.

3. Shading of desirable aquatic species.

4. Waste of fertilizer.

5. Competition with more desirable species.

6. Being parasitic on higher and more desirable plants.

7. Making some waters difficult or impossible to fish.

8. Protecting small forage species from predator fish and letting the pond get unbalanced.

Being a fisheries biologist, I am interested in producing the best fishing possible, therefore consider all aquatic weeds a nuisance, with the exception of certain algae resulting from fertilization, and therefore try to keep a pond or lake weed-free.

In the past weed control was accomplished by physical means—mainly cutting—but now chemicals are on the market that will kill most, but not all, aquatics. The main disadvantage of using chemicals is the cost.

The first step in control of aquatics is to identify them. Certain chemicals will give better control of a particular aquatic than others and while several chemicals may give equally good results, one may be less expensive. For this reason it is usually best to have



1. Here's what was once a good fishing pond covered with water lilies, a common sight on South Carolina ponds. (All photos by Buehler.)

a biologist or similarly trained person check a pond, identify the vegetation and then make recommendations as to control. However, I will describe some of the more common aquatics that can usually be identified and controlled without professional help.

Anyone planning to treat a pond should have thorough knowledge of the substance being used and should exercise extreme care, for some of the substances are definitely dangerous.

White water lily is very common in our ponds and lakes in South Carolina. As shown in Photo 1, it can become so thick that fishing is almost impossible.

Photo 2 is water-shield, another rooted-floating plant that may be confused with the water lily. It is about the size of a silver dollar. Note that the leaves are elliptical and have no indentation, as does the lily. The petiole and under surface of the leaf is coated with a thick jelly-like material. (Do not confuse the other two aquatics in the picture which are not floating.)

Granulated 2,4-D (50-100 lbs. per acre) or granulated aquathol plus

(100 to 150 lbs. per acre in 2 to 3 feet depth) will usually give good control.

Both chemicals cost approximately 32 cents per pound. They can be spread by hand, eliminating any spray equipment.

2,4-D remains in the water for a longer period of time than the aquathol plus, but treated with aquathol plus ponds can be used for irrigation purposes sooner.

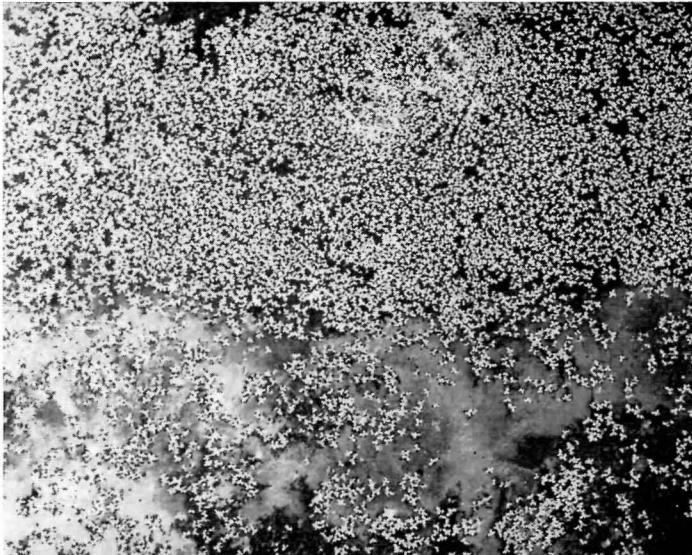
Duckweed (Photo 3) is a free-floating plant usually found in ponds protected from the wind by high banks and trees. The plants are very small; seldom over a centimeter along any dimension. It multiplies so rapidly that after treatment, if not all is killed it will soon be abundant again. Several treatments are usually necessary to control it and when any is seen thereafter it should be sprayed before it spreads.

One-fourth pint 2,4-D ester to 5 gallons fuel oil (approx. 30 gal. per acre) or 5 gallons liquid aquathol per acre mixed with five gallons of water and 10 ounces of liquid detergent (sticking agent) will usually give good control.

2,4-D liquid costs approximately \$3 per gallon and aquathol \$7 per gallon. The 2,4-D treated water should not be used for irrigation purposes for six weeks, maybe longer. The aquathol treated water can be used for irrigation purposes and livestock



2. Water-shield is another pest that has ruined many ponds.



3. Duckweed can take over a pond in rapid order, the tiny plants covering the surface. 4. At right a pond is sprayed, the only way to get rid of the pest.



watering after seven days and recreational purposes after 24 hours.

A heavy 2,4-D oil treatment may give the fish an oily taste for some time, but is safe for livestock watering soon after treatment.

Photo 4 shows the actual treatment of duckweed with a power sprayer. A small three to five gallon handpump sprayer can also be used.

Photo 5 shows a marginal weed (arrow-arum) and Photo 6 bullrush, both of which can be treated by using $\frac{1}{4}$ pint 2,4-D per five gallons of fuel oil or kerosene.

Photo 7 shows parrot feather. There is another variety of this plant found in our territory, but it does not have the emergent head as shown here. This particular species is easier to control than the totally submerged species.

Fifty to 100 pounds granulated 2,4-D per acre, according to density of growth, will usually give good control.

Sodium arsenite is one of the oldest standbys for submerged vegetation, including parrot feather, but must be handled with care due to toxicity. Where animals will not be using the water for a short time then it is usually safe. It is one of the cheapest herbicides costing approximately 85 cents per gallon. Three gallons of the 40% solution per acre foot of water

is recommended. This can be diluted with water to insure good coverage and be sprayed or run from a drum by gravity flow.

Cattails and bulrush can be controlled with Dowpon at the rate of five pounds per 50 gallons water per surface acre. The cost is approximately \$6.75 per five pounds or \$2.35 per pound.

Copper sulfate will control most forms of algae or pond scum, but care

must be taken in its application, since it is very toxic to fish. Normally 2.7 pounds per acre foot of water is safe unless the water is very soft. For this reason the water should be checked for hardness before applying copper sulfate. (Pithophors, a branched filamentous algae, cannot be controlled with copper sulfate.)

Probably the most troublesome plant is alligator weed, which will completely choke off a pond as shown



5. Arrow-arum a marginal weed, is another of the many pests that worry pond owners.

in Photo 8 on page 12. This pest cannot be eliminated by chemical means, once it gets established. In the near future, I am sure someone will develop a herbicide for alligator weed control.

If this weed is spotted in a pond or lake and has not spread to any degree then treating with Sylvex is recommended at the rate of eight pounds per acre. The cost is approximately \$2 per pound and about four treatments will be necessary.

For best results in control of troublesome weeds in ponds and lakes, treatment should be in the spring (water temperature 65° or above), when plants are young and growing vigorously.

In water that cannot or will not be fertilized properly (maintaining a good bloom), treatment of aquatic weeds will give only temporary help with the same vegetation or another species probably appearing the following year.

In ponds that can be fertilized properly, after the weed is eliminated, then by maintaining a bloom the sunlight will be shaded from the pond bottom and weed growth prevented.

In fertilized ponds that have shallow edges (18" and less), then weeds may grow to a small extent.

Diquat is another herbicide on the market which also will control most aquatic plants but due to lack of experience with it I will not comment on it at the present.

SCWRC

A Review

(Continued from page 3)

The continuing study of striped bass in Santee-Cooper, culminating in the stocking of upstate reservoirs and the building of a hatchery below Lake Moultrie, the first in the world;

Fish populations studies on the various reservoirs, now expanded to take in some rivers;

The securing of land for waterfowl refuges and for public shooting;

The setting up of game management areas on National Forest land in



6. Joe Logan, author of this article, examines a stand of bullrush.



7. Here's parrot feather, a pest that has taken over many old shallow water ponds over the State.

cooperation with the U. S. Forest Service;

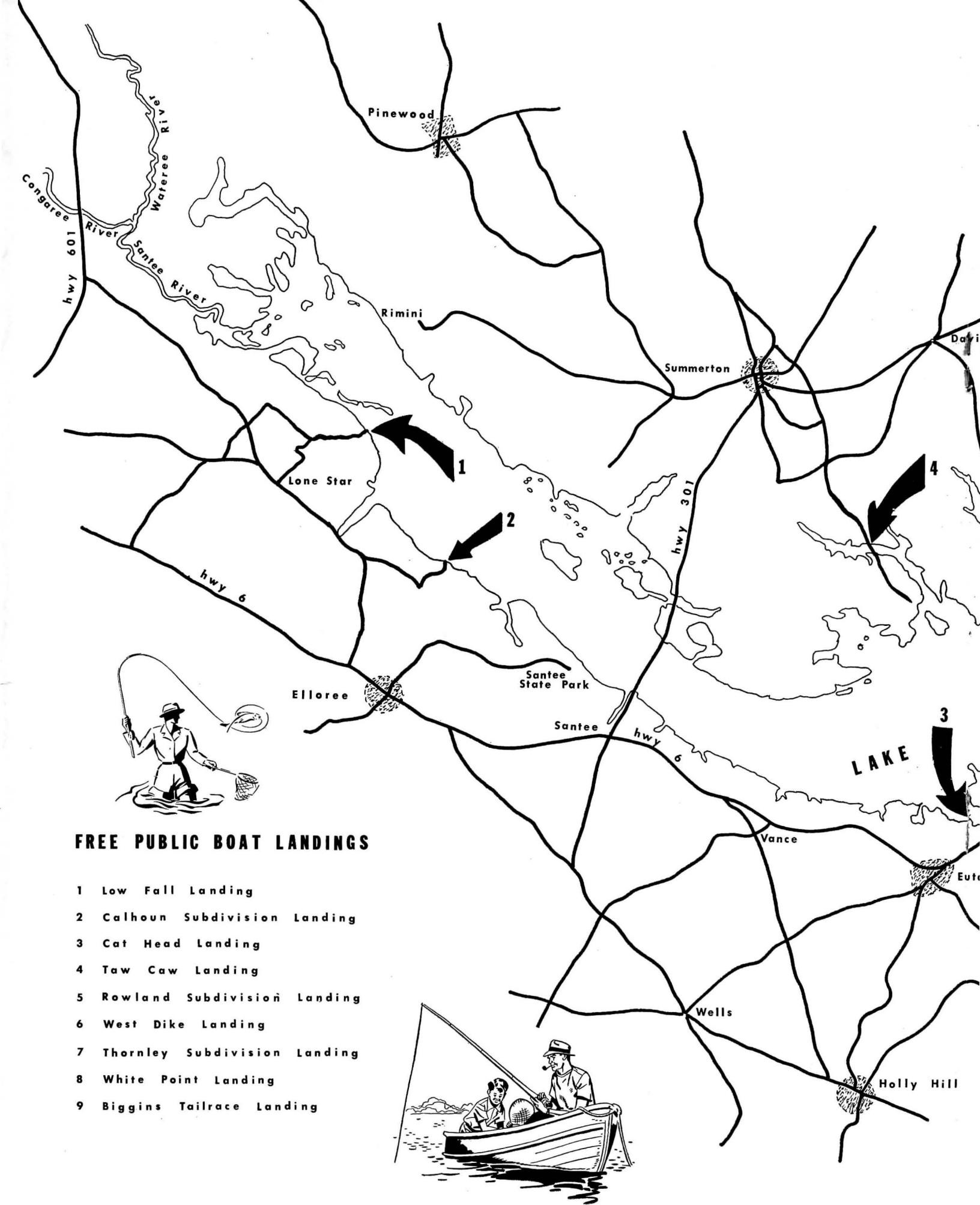
Experimental stocking of exotic game birds on suitable habitat, the program still too new to evaluate;

Abandonment of the non-productive and expensive quail hatchery

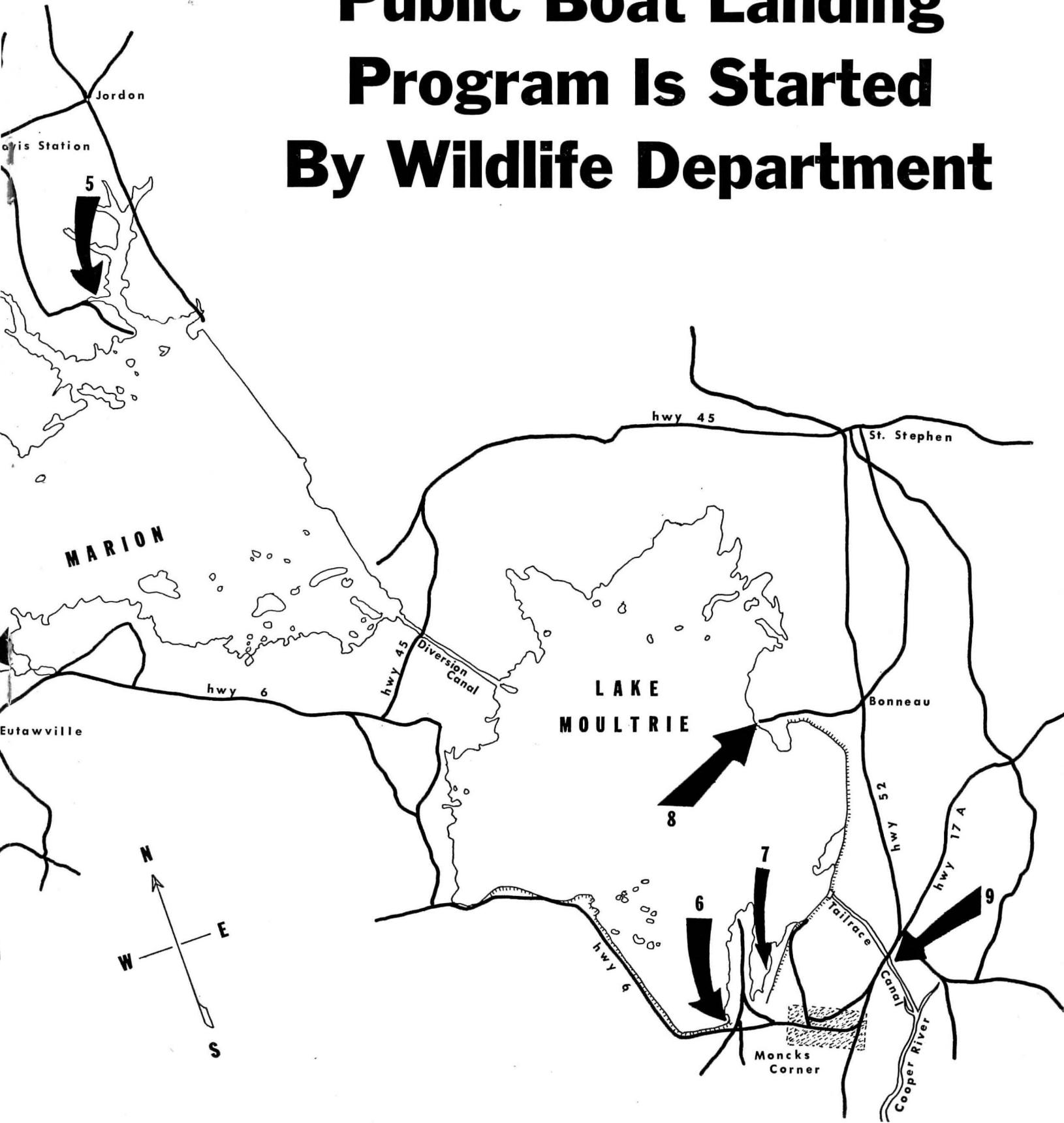
program and placing of emphasis on improving food and cover conditions, including the growing and distribution of bicolor;

A revaluation of the trout stocking program, which has resulted in better

(Continued on page 12)



Public Boat Landing Program Is Started By Wildlife Department



Plan Now For Dove Shooting Next Fall

The 1964 dove season may seem like a long way off but it is not too early to start planning for dove fields, and leasing dove hunting rights on planted fields is not only legal but can be profitable.

Last year the Department started a program of financing the planting of 10-acre food patches of brown-top millet, soybeans or corn. The fields were planted by landowners, financed with Department funds, and there was no charge for the public hunting. Each field was hunted one afternoon a week. A total of 2,396 hunters bagged 7,199 doves on 15 fields which had been planted under the program. This fall the program will be ex-

panded and with the experience gained the hunter success should improve.

The Department pays the landowner planting the field \$30 an acre, but he must furnish the labor and seed.

Also, private landowners can lease hunting rights to individuals on a daily rate or to clubs on a season basis, approval of the Department not being necessary. Under arrangements of this kind the Department would not finance any part of the planting but would offer technical advice.

In the upstate counties, fields planted in brown-top millet probably

hold the greatest attraction for doves. The seed of this plant is highly preferred, particularly during the early part of the season. Since doves prefer bare ground along with the food-producing vegetation, the brown-top should be planted in rows six feet apart.

In the Low Country, where the doves congregate in the colder weather, fields of soybeans or corn are probably best. The corn fields, after being harvested in a normal agricultural manner, should be burned over to rid them of the residue and weeds. Corn fields can be "hogged off" as an alternate method of harvesting.—A. B.

A Review

(Continued from page 9)

fishing through the stocking of catchable size fish from the federal hatchery;

Carrying on research projects on various game species, including a study of the marsh hen;

Building of launching areas on the reservoirs and rivers;

Furnishing advice to pond owners and providing fish for restocking private ponds.

Until the Commission was established there was no education or information work being carried on but a full program is now under way, including the following programs:

Much work is carried on with youth groups and a Conservation Camp is held for boys and girls each summer, with other conservation agencies cooperating;

A Department magazine is published and releases and special articles are sent out regularly, while a radio program was recently started;

Speakers, including ones from the other Divisions, are available for youth, school, civic and sportsmen's groups;

Cooperation and instruction is provided for the inservice training program of the Department;

A regular library of conservation films and slides is kept up;

Exhibits are placed at county fairs and other places;

Workshops and conferences are attended.

—SCWRC—

Snakes probably are unable to detect air-borne vibrations. This means that a rattlesnake has never heard its own or another's rattle.



Alligator weed, found in the lower part of the State, can choke a channel in a river or take over the still waters of a pond. It is one of the few aquatic weeds that can not be controlled by chemicals.

Santee-Cooper Access Program Started

By JEFFERSON C. FULLER, JR.
Chief of Fisheries

A long time need is being fulfilled on the Santee-Cooper Reservoirs with the construction of nine access areas so that hunters, fishermen and pleasure riders will have places to launch their boats. Although both public and commercial landing have been available since the completion of the reservoirs, these have never been adequate to meet the steadily increasing numbers of sportsmen. The present construction will still not fill the need entirely but will alleviate much of the load.

Generally these areas will consist of a parking lot, launching ramp and possibly access canals. Fifty percent of the funds for construction work was obtained from the federal government through the Accelerated Public Works Program. Land for the areas was granted to the Wildlife Resources Department by the Santee-Cooper Authority.

Following is a brief description of each area. All of the launching ramps are double-size (20 feet wide) reinforced concrete with rough surfaces to assure traction. Each parking lot is roughly one acre in size, covered with crushed stone and bounded on three sides by a steel cable:

Berkeley County:

1. West Dike Landing: Located at the end of the dike approximately four miles west of Moncks Corner, it contains ramp, parking lot and canal. The canal is needed to assure access to deep water even during periods of low water. This canal is approximately 350 feet in length, fifteen feet wide at the bottom and has side slopes of $1\frac{1}{2}$ to 1.

2. Biggins Tailrace: Located northeast of Moncks Corner on the east side of the Tailrace Canal, across the canal from the "government locks". Area includes only a parking lot. A bituminous-surfaced road and boat



Here are two views of landings recently completed by the Wildlife Resources Department on Santee-Cooper. At the top, an angler loads his boat at West Dike landing while in the bottom photo heavy equipment is still working on the Calhoun landing. A map showing the landings is on pages 10-11. (Photos by Brown.)



ramp were present prior to this project.

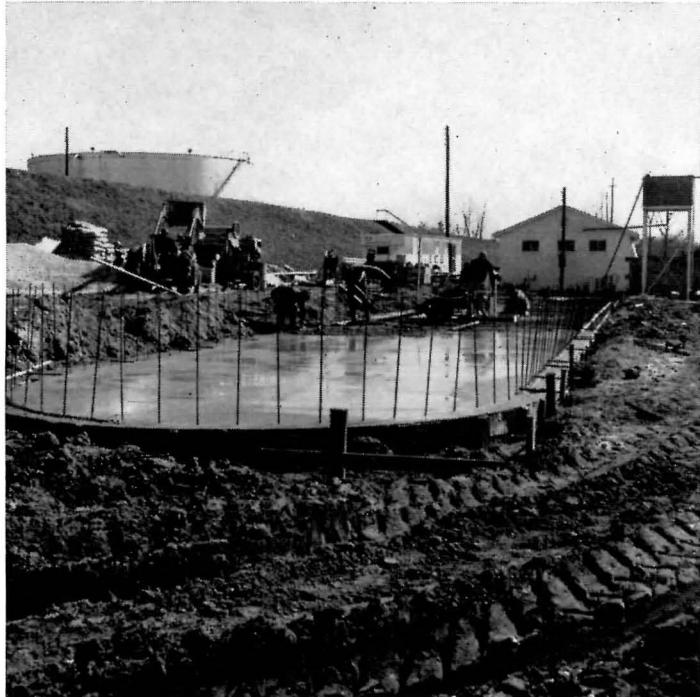
3. Thornley Subdivision: Located approximately five miles northwest of Moncks Corner on Lake Moultrie. Area includes a parking lot, boat ramp and canal. The canal will be approximately 450 feet in length, 15 feet

wide at the bottom and have side slopes of $1\frac{1}{2}$ to 1.

4. White Point Beach: Located two miles west of Bonneau on Lake Moultrie at the end of paved road 42 (Black Oak Road). This project will consist only of a double-sized con-

(Continued on page 18)

Hopes High For Striped Bass Hatchery



Here's construction work going on at the new-completed striped bass hatchery below the Pinopolis Dam. At the left, concrete is being poured for the holding pool in which the fish will be kept until they are ready to spawn. At the right,



the foundation for the pool is being laid. The hatchery went into operation in early April and in the summer issue we'll have a report on its success. (Photos by Brown.)

By OTHO MAY
Fisheries Biologist

The Santee-Cooper reservoirs of South Carolina have become well known through the nation for their land-locked, self-renewing populations of striped bass. The fabulous success of the striped bass in these reservoirs led the South Carolina Wildlife Resources Department to attempt to establish this fine game fish in all the State's major reservoirs, and after some years of limited success prospects are bright.

At the beginning of this program, little was known of the spawning habits of the striped bass or of the habitat requirements necessary for a successful spawn. Because of this lack of knowledge, early attempts to establish striped bass populations were chiefly experimental, and the first attempts consisted mainly of an annual stocking program. The first stocking was conducted in Lake Greenwood in January, 1955, at which time 297 adults averaging nine pounds were

stocked. These fish had been caught with hook and line below Lake Moultrie. Later stockings were made in the other large reservoirs of the State, these stockings consisting of both adult fish and fingerlings, the latter seined from the Santee-Cooper reservoirs.

These stockings were continued for a number of years without any indication of reproduction, and while they were unsuccessful in producing a striped bass fishery, a more complete understanding of the spawning habits and habitat requirements was obtained. (The stocked fish, while failing to reproduce, grew at a satisfactory rate and striped bass of up to 35 pounds have been caught in both Murray and Greenwood.) These failures led to the conclusion that if a striped bass fishery was to be established, natural reproduction, by some means, would have to be duplicated in the desired reservoir.

In 1961, a striped bass hatchery was established and put into operation on the tailrace canal near Moncks Corner. The output of striped bass fry from the hatchery has steadily increased since the start of operation and we feel that within a few years the number of fry produced will be limited only by the capacity of the hatchery.

To create and maintain a satisfactory striped bass population in a given reservoir will require annual stockings of fry approximating natural reproduction. At the present hatchery output, we can hope only to duplicate natural reproduction in one or two of our smaller reservoirs. This means that if each reservoir is to be stocked, stockings will have to be rotated from one reservoir to another from year to year. A limited striped bass fishery could be established in this manner; however, such a fishery would not be the most desirable.

The ultimate success of this program will be measured in terms of

harvestable-size striped bass contributed to the overall fishery in a reservoir rather than the number of fry stocked each year. There are indications that predation by other species on the stocked fry is heavy and, also, that quite a bit of cannibalism occurs among the fry. If this predation could be reduced or eliminated, and thus the survival rate increased, the result would be approximately equal to increasing the hatchery output by the same proportion.

Last spring a unique experiment was undertaken by the fisheries division of the Department—the successful raising of striped bass fry in a warm water hatchery normally used for the production of bluegill bream and black bass. A number of striped bass fry produced in the Moncks Corner hatchery were transported to the Newberry hatchery and released in a three-quarter acre pond. The day-old fry were no larger than the head of a pin but one month later, when they were released in Lake Murray, the average length of the 3,700 fingerlings released was 2.4 inches. The survival rate was 7.2 per cent, believed to be considerably higher than in the wild, while the rate of growth was also greater.

This survival rate was obtained in a pond which was free of other fish. It is believed that the survival rate would have been higher had a forage species been present to reduce the natural cannibalism.

A further and more detailed study will be carried out at the Newberry hatchery this summer to determine the feasibility of rearing fry to fingerling size before stocking. A series of experiments will be set up in seven of the available ponds at the hatchery. Since goldfish can be held under crowded conditions and be made to spawn almost at will, they will be used as the major species to determine if the presence of a forage species will reduce cannibalism among the striped bass fry. Experiments conducted will be as follows: striped bass fry stocked alone; pond fertilized,



Governor Russell discusses plans for Conservation Week, sponsored by the Wildlife Federation, with conservationists. Left to Right: Director James W. Webb; Education Chief Gordon H. Brown, state chairman of Conservation Week; Rep. John Lee of Sumter, state president of the Federation; Governor Russell; and Wildlife Resources Commission Chairman Edwin W. Johnson of Spartanburg. (Photo by Buehler.)

striped bass fry stocked alone; pond unfertilized, striped bass fry stocked followed one week later with stocking of adult gold fish; pond fertilized, striped bass stocked along with goldfish eggs; pond fertilized, striped bass fry stocked in pond containing adult gizzard shad; pond fertilized, striped bass stocked followed two weeks later with stocking of adult bluegills; pond fertilized and striped bass fry stocked into pond containing several other species of varying sizes.

Each experimental pond will be stocked with a known number of striped bass fry as soon as they are available from the Moncks Corner hatchery. Progress of the fry will be determined at periodic intervals by means of a seine and stomachs will be collected from some individuals from each pond at each check to determine the food habits. At the end of approximately two months, all ponds will be drained, the surviving fish will be counted and the survival rate for each pond determined. The surviving fingerlings will be trans-

ported to one of the State's reservoirs and stocked.

The work at the Newberry hatchery will be controlled experiments and at no time during the experiment will striped bass be available to the public.

We definitely do not recommend their stocking in small ponds.

—SCWRC

Aerial surveys of the trout streams of Greenville, Pickens and Oconee counties will be taken three times each month during March, April and May, the survey involving a count of the numbers of cars. There will also be a pressure count of fishermen by wardens checking the streams.

Trout released by District One wardens during February included: Greenville, 9,300; Oconee, 8,300; and Pickens, 6,150. Streams are closed for the last seven days of March, April, May and June to allow the stocked fish to scatter and become used to their new homes.

—SCWRC

The raccoon leaves a footprint which greatly resembles that of a small human child.

Charleston Hunter Reports On Ducks

Having heard and read various reports from conservation officials, sportsmen and other observers regarding how waterfowl populations last season compared with those of previous years we decided to check with the persons most interested—the duck hunters. And here is the report from one of them—Frank C. Ford of Charleston. He writes as follows:

I feel that there are many others in this area who are more qualified than I am to give you information on the 1963 duck season, but since you have asked me I will be glad to give you what information I can regarding the population and season in general.

My hunting was done mostly in the Ashepoo and Combahee area, but I did hunt some on the Cooper River. In the Ashepoo area from the opening day through December 15 or 20, I thought there were considerably less ducks than I saw last year; however, during the last three weeks of the season the population compared

very favorably with last year. I believe there were more Mallards and Black Ducks this year than last in this area. Many less Pintail, but more Baldpate and other members of the Widgeon family, but less Ringneck, Blackheads and Bluebills. There were about the same quantity of Teal.

On the Cooper River I believe the population was about the same as last year. The majority of ducks that I saw were of the Widgeon family. However, I saw less Pintail in the area than usual. There were lots of Gadwall and Baldpate in the marshes and flats on the Cooper River. There were large quantities of Mallards and Black Ducks, but they were very spasmodic in their flights. Some days there were lots of ducks to be seen and other days very few, but as a whole there were more this year than last.

I understand in the upper area of the Cooper River some places reported lots of Scaup and Ringneck, possibly on account of the water depth, and shooting was much better

as a whole this year than last and more ducks of all species were seen.

I have had the pleasure of visiting some plantations in the Ashepoo and Bear Island areas since the closing of the season and I can say that I did not see as many ducks all season as I have seen in the last three weeks. They are in that area by the thousands. It is hard to determine the reason for this influx of ducks since the close of the season.

I do hope that next year South Carolina can get a season which will begin later and be extended through January. Duck hunting would be much better for the hunters in general and I believe it would be more profitable in the sale of Duck Stamps which would enable us to buy more water lands for our wild fowl.

Hoping to have the pleasure of seeing you some time in the near future.

Yours very truly,

Frank C. Ford.

More Ducks Last Year, Agent Says

There were more ducks in South Carolina last season than in the previous year, according to Harold S. Steele, U. S. Game management agent, although the official census showed a decline.

This was due, Steele said, to the extreme cold that prevailed during the census period last year, the result being that most of the mallards and black ducks on the Atlantic Flyway were concentrated in South Carolina the week after the season closed in 1963.

This year's survey, conducted January 6-11, showed 620,000 waterfowl, compared with 700,000 last year.

Steele points out that this survey is not so much designed to determine actual numbers as to learn the trends by comparing populations from year to year. The same areas are covered by the same observers year after year, using planes, cars and boats.

One species in which the survey shows trends rather than actual numbers is the summer duck. Due to the fact that the summer ducks stay mainly in the swamps only 12,000 were counted, although it was estimated there were 150,000 in the State.

The survey showed that the goose population was up, although the geese were concentrated on the refuges and provided little shooting.

Steele estimated that the dove population was down 20 to 25 per cent over the previous year.

Jack's Creek Area Opened

The Jack's Creek area on the Bull's Island unit of the Cape Romain National Wildlife Refuge was opened to fishing April 1 and will continue open through September 30. Limits are 10 bass and 25 bream and all State regulations apply.

No motor boats will be allowed on the area. Transportation to the island can be secured by writing Mrs. C. H. Mills, Awendaw, S. C., Reservations must be made in advance. Rental boats will be available.

SCWRC

There are nearly 3,000 known species of lizards and they are distributed throughout the world.



Plane Proves Value in Rescue

The Department plane and its ground-to-air radio communications again proved its value in rescue operations when it located three men marooned in the Santee swamp the weekend of January 18-19.

The story started when four young men from Columbia in two boats went into the swamp above the mouth of Broadwater Creek on the Sumter side of the river planning to spend the weekend hunting. Three of the men then left camp in one boat. They failed to return by dark and the man left at the camp, unfamiliar with the swamp, could do nothing but wait for their return.

It happened that the three men in the boat had become lost and given out of gas. The water was high in the swamp and they had to spend the night huddled in the boat. The next morning they found a ridge and started walking along it, hoping it would take them to the high land. However, the ridge turned out to be an island and there was nothing to do but wait for rescue.

Meanwhile the man at the camp, after spending a night and morning of worry, came out of the swamp in the other boat. He contacted Warden Frank Weeks who immediately called the other two Calhoun wardens—M. C. Parler and G. M. Early—and the Department pilot, Russ Settle. Settle flew down and picked up Weeks at Fort Motte, while Parler and Early put in the river in their boat. The plane spotted the men on the ridge just before dark and directed the boat to the scene. The three marooned men

were picked up and carried to safety—cold, hungry and tired.

The following letter was received by Supervisor Gene Howell from the wife of one of the rescued men:

“Speaking both for the families and personally as the wife of one of the three men who were lost in the Wateree swamp this past weekend, I want to commend Mr. Frank Weeks and the other game wardens in District One who assisted in an excellent and courageous manner in locating these men and bringing them to safety.

“It is good to know we have someone to call on when the need arises and that when we do we can count on prompt action and complete cooperation.

“Yours truly,
“Mrs. Jerry B. Buddin.”

SCWRC

Warden Jackson Passes at York

Roy Jackson, York County game warden since 1951, died March 21 at the Clover Hospital. Services were conducted from Bethel Presbyterian Church with burial in the church cemetery.

Born April 30, 1900, in York County, he was the son of the late Joseph William and Mrs. Katie McCully Jackson. He was a member of Bethel Presbyterian Church.

Survivors include his widow, Mrs. Nannie Boyd Jackson; three sons, Wideman Jackson, Charles Hope Jackson and Billy Grier Jackson, all of Clover; two daughters, Mrs. Tom

Ed Johnston of Clover and Mrs. James Hawfield of Fort Mill; a brother, Frank M. Jackson of Clover; a sister, Mrs. H. K. Davis of Clover; and six grandchildren.

SCWRC

Adam H. Clayton Dies in Wreck

Adam Herbert Clayton, former game warden from Dorchester county, was killed in an automobile crash near his home at Givhans December 18. He was 67.

A native of Givhans, Mr. Clayton was born Oct. 15, 1896, a son of Mr. and Mrs. M. S. Clayton.

Surviving are six daughters, Mrs. P. G. Tuttle, Mrs. Lloyd Strobel and Mrs. Milton Poirear, all of Givhans, Mrs. Harold Lott of St. George, Mrs. Tom Campbell of Ehrhardt, and Mrs. Leonard Freeman of Rockingham, N. C.; three sons, Joseph M. Clayton and John H. Clayton, both of Givhans, and Jackie D. Clayton of Summerville; a sister, Mrs. Mamie McDonald; a brother, W. H. Clayton of Charleston; his stepmother; five half-sisters and a half-brother.

SCWRC

Aiken County Wardens R. F. Williams, N. J. DeLoach and W. A. Medlock took on a new job in February, acting as dog wardens in protecting a pack of 30 foxhounds which had chased a fox into the town of Leesville. Traffic was heavy on the highway and also a freight train was approaching. The wardens stopped all traffic, including the train, until the dogs could be moved out of the danger zone.

Study of Two Rivers Begun

Continuing studies designed to determine ways to improve sport fishing on the Little Pee Dee and Black Rivers were started last winter under the supervision of Fisheries Biologist Robert E. Stevens. The work has consisted of the use of experimental gill nets, an electric seine, and population studies by the use of chemicals.

Weekly sets of gill nets—3 1-2, 4 and 5 1-2 inch stretch—have been made since December with a two-fold purpose. The primary purpose has been to determine the number and kinds of different fish in each river, and also to remove large quantities of rough fish during the winter months and improve fishing for game species during warm weather.

The use of the electric seine will provide supplemental information. The seine is powered by a portable generator with an arrangement of capacitors, tubes, electrodes and switches that stuns all species of fish. The stunned fish are then picked up in dip nets and returned to the water after information as to length, weight and species has been recorded.

"Spot check" population studies will be made through the use of chemicals.



Fisheries workers Ed Mitchum and Clarence Murray pull one of the experimental nets used in the Pee Dee-Black River study. (Photo by Buehler.)

Using this technique, all the fish in a small area are killed with a chemical which causes asphyxiation. All specimens are then studied as to rate of growth, reproduction and species composition.

Every weekend for a one-year period a creel census will be conducted on each river. An employee of the Department will contact sport

fishermen at random to see how many they caught, what kinds, average weights, length of fishing trip and related data.

Once all the data is compiled and analyzed, the Department will know fairly well the condition of each river and be in a position to inaugurate management practices which should improve fishing.—J. C. F.

Santee-Cooper

(Continued from page 13)

crete launching ramp and sheet piling to protect the ramp from wave action.

Orangeburg County:

1. Cathead Landing: Located approximately two miles northwest of Eutaw Springs on Lake Marion. Project includes a parking area and boat launching ramp.

Calhoun County:

1. Calhoun Subdivision: Located approximately three miles north of Ellorree. Project will consist of a parking area and boat launching ramp.

2. Low Falls Landing: Located approximately three miles east of Lone Star. Project will consist of a parking area, boat launching ramp and canal. The canal will be approximately 850 feet in length, 10 feet wide at the bottom with side slopes on a 1½ to 1 ratio.

Clarendon County:

1. Taw Caw Creek: Located approximately 20 miles southwest of Manning on Lake Marion. Project will include a parking area and boat launching ramp.

2. Rowland Subdivision: Located approximately 12 miles south of

Manning on Lake Marion. Project will consist of a parking area and a boat launching ramp.

SCWRC

The Department of Interior has recommended Congaree Swamp, a narrow strip of land bordering the Congaree River below Columbia, for establishment as a national monument.

Elbert Cox, director of the National Park Service's southeast region, in making the announcement said, "The monument would preserve in perpetuity a magnificent southern bottomland forest in its near-virgin condition."

Boating Tips For Safety Afloat

1. Be sure everyone in boat knows how to swim.
2. Don't overcrowd. Keep passengers in boat down to a safe number.
3. Don't overpower boat; your dealer can tell you what size motor is safe.
4. Equip boat with safety items, such as anchor, oars, boat hook, extra line, fire extinguisher, tool kit, first aid kit, and jacket or preserver for each passenger. Running lights are a must if you plan to be on the water at night.
5. Don't smoke while fueling.
6. Check forecast before going out in boat, and if you plan to go far it is a good idea to take along a small transistor radio to keep you posted on the weather.
7. If your boat capsizes or swamps, don't swim away from it. Hang on until help comes. It usually will float.
8. Enroll in any of the excellent boat-handling classes offered by U. S. C. G. Aux., U. S. Power Squadron, or your American Red Cross Chapter.

—SCWRC—

One South Carolina deer hunter has made a definite resolution, namely not to carry his young son with him when he goes deer hunting. He took along the boy on a deer drive last fall and after some time on their stand a buck was seen approaching. The hunter took aim and the boy cried out, "You ain't going to shoot Bambi, are you?" The hunter didn't as the alarmed buck leaped aside into some thick bushes and made his escape.

—SCWRC—

The first bow hunting fatality in many years was reported last fall from Virginia, where a 21-year-old hunter was shot in the neck by a 19-year-old companion, who saw a movement in the brush and thought it was a deer.

The arrow struck the victim in the neck, severing the jugular vein, the



A 39-pound striped bass, probably one of those stocked by the Department 10 years ago, was found dead in Lake Murray in January, a victim of its own appetite. The big stripers, choked to death by a three-pound bass it had tried to swallow, was found by Dr. John Parler of Batesburg (holding the fish) while Ken Amick stands by. (Saluda Sentinel photo.)

windpipe and the carotid artery, finally lodging in the bones of the opposite shoulder.

—SCWRC—

Wardens C. O. Laffitte, Mendel Boozer and H. H. Keisler assisted Army demolition personnel in removing old bridge pilings from Lake Murray near Black's Bridge. The old

pilings presented a hazard to boaters during high waters after dark and had caused several accidents.

—SCWRC—

Fish occupy every type of water from those at the Antarctic, which are below freezing, to hot springs which reach a temperature of more than 100 degrees Fahrenheit.

Listed below is the enforcement record for the month of February:

Total Fines Collected—Hunting and Fishing	\$4,370.00
Total Prosecutions—Hunting and Fishing	223
Total Prosecutions—Boating	17
Total Fines Collected—Boating	\$ 232.00
Total Cases Not Guilty	7

Weekly Radio Program Started By Department

South Carolina Wildlife, a five-minute radio program, is now being presented twice weekly over 12 stations in the State. Information on hunting, fishing, Department activities, and natural history is presented. Occasionally biologists with the Department and guests from other conservation agencies are interviewed. The program, which is conducted and sponsored by the Information and Education Section, should be of interest to hunters, fishermen, and naturalists. It is in charge of Art Buehler, information assistant.

The stations over which the program is presented and the days and times are:

WBEU — Beaufort	Mon. 5:15 P. M.	Wed. 5:15 P. M.
WCSC — Charleston	Sat. 5:35 P. M.	Mon. 2:35 P. M.
WIS — Columbia	Fri. 6:35 - 7:00 P. M.	Sat. 8:35 - 9:00 P. M.
WQXL — Columbia	Sat. 6:10 A. M.	
WOIC — Columbia	No Set Time	
WOLS — Florence	Sat. 1:00 P. M.	Sun. 1:00 P. M.
WFBC — Greenville	No Set Time	
WBHC — Hampton	Wed. 5:20 P. M.	Sat. 5:20 P. M.
WHHL — Holly Hill	No Set Time	
WBER — Moncks Corner	No Set Time	
WRHI — Rock Hill	Wed. 6:35 P. M.	Fri. 6:35 P. M.
WORD — Spartanburg	Sun. 3:05 P. M.	Sat. 9:05 P. M.

Thirty deer were killed on South Carolina highways and two by a train in Jasper county during January and February, according to reports received by the Law Enforcement Division from wardens over the State.

County totals included: Williams-

burg, two; Orangeburg, one; Marion, four; Dorchester, two; Sumter, three; Georgetown, four; Fairfield, one; Colleton, three; Oconee, one; Allendale, three; Jasper, two; and Beaufort, four.

These were only the deer actually killed and their bodies found at the

scene of the accident, and undoubtedly others were hit and died of their injuries.

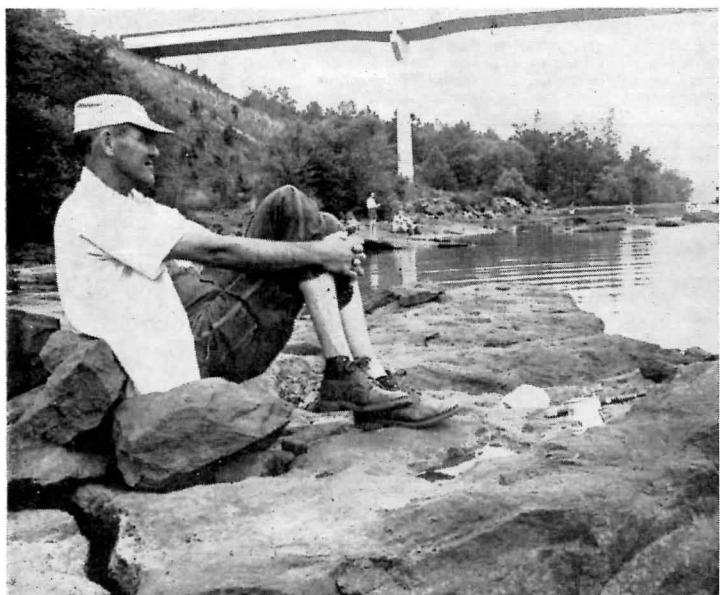
SCWRC

A doe deer killed by a Missouri hunter last fall had been tagged as a fawn way back in December of 1946. The doe had lived through eight any-deer seasons, even though in a heavily hunted area. She was killed only two miles from where she had been tagged originally, although another tagged doe killed last year had traveled 90 miles in a year.

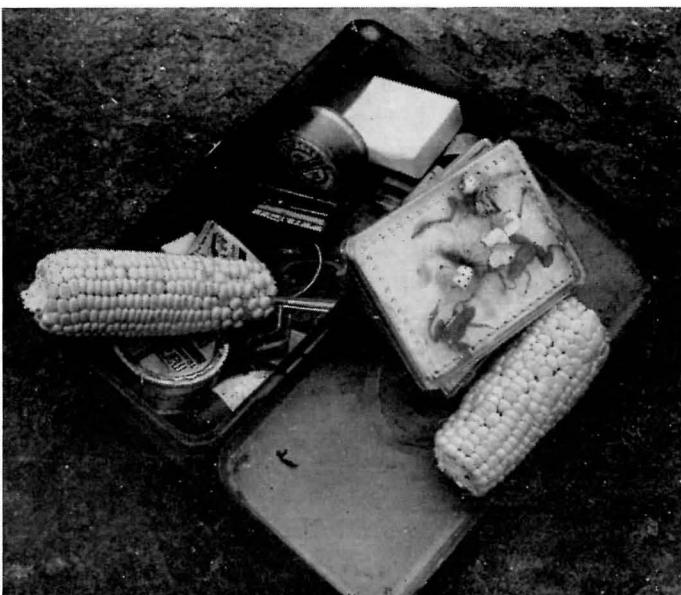
SCWRC

Louis D. McGregor, Flint, Mich., judge of Michigan's 7th Judicial Circuit since 1960, was elected president of the National Wildlife Federation during the final session of the organization's 28th annual meeting held March 6-8 in Las Vegas, Nev. He succeeds Ross L. Leffler, New Florence, Pa.

Federation delegates from all 50 states also re-elected William M. Apple, Little Rock, Ark., to a 3-year term as vice-president. Apple, who has been active for many years in outdoor recreation and conservation affairs, also was named treasurer.



Trout fishing, regardless of what the purists write, is not all a matter of tiny flies, tapered leaders and delicate rod handling. Here a trout fisherman sits patiently waiting for a trout to bite below Hartwell dam on the Savannah



River. At the right, believe it or not, is the bait he is using—kernels of fresh corn. Other preferred baits are Velveeta cheese and small bits of marshmallow. (Photos by Brown.)

DISTRICT FOUR

A. M. FLOOD, JR., *Supervisor*

MONCKS CORNER, S. C.

P. O. Box 788

TELEPHONE 825-3356 (Office)

Locust 7-2240 St. Stephen (Home)

Berkeley, Charleston, Colleton, Dorchester, Georgetown and Williamsburg Counties:

NAME AND ADDRESS	TELEPHONE
David G. Anderson, Box 311, Moncks Corner, 825-5152	
Wade H. Baxley, 1509 Devons Ave.—	
Charleston	795-3776
Robert C. Borders, 1728 Camp Rd., Charleston	
John G. Branham, 103 Tall Oak Ave.—	
Charleston	SN 6-1155 or SN 6-4251
G. H. Burbage, Rt. 1, Box 625—	
Summerville	TR 3-8191
J. H. Clayton, Rt. 3, Ridgeville	873-9803
Clement Craven, Rt. 3, Walterboro	549-9171
Herman H. Crosby, Rt. 1, Box 59-A—	
Walterboro	538-8628
Wilbur W. Cross, Cross	849-3515
Oscar M. Dennis, Box 74—	
Bonneau	LO 7-2066
C. E. Doyle, Jr., Rt. 1, Box 149, Ravenel	SN 6-7949
G. W. Fennell, Rt. 2, Walterboro	539-7327
L. M. Freeman, Box 154, Mt. Pleasant	TU 4-9469
John R. Gamble, Greeleyville	426-4345
W. E. Harrelson, Rt. 3, Box 79, Georgetown	

DISTRICT FIVE
BOYD A. GREGG, SUPERVISOR

ROUTE 3, Box 360

TELEPHONE 662-5637

FLORENCE, S. C.

Chesterfield, Clarendon, Darlington, Dillon, Florence, Horry, Lee, Marlboro, Marion and Sumter Counties:

NAME AND ADDRESS	TELEPHONE
Floyd Benton, Rt. 4, Loris	357-4708
Pearly Britt, Mullins	464-8759
Ervin M. Brunson, Pocalla Springs, Sumter	
J. Ellison Bryant, Rt. 2, Box 228, Manning	473-2451
Coy Lee Carter, Rt. 1, Box 55, Longs—	
	357-4646 Loris Exchange
Billy Joe Craft, 113 Huggins St., Manning	435-4871
R. A. Floyd, Rt. 1, Olanta	349-3371
W. R. Haselden, Box 201, Johnsonville	EV 6-7971
Robert E. Hayes, Lakeview	759-2488
W. E. Jackson, Rt. 2, Box 63-B, Sumter	469-3985
J. H. Carlisle Jones, General Delivery,—	
	Gresham 457 M 2
W. R. Jones, Box 172, Chesterfield	MA 36266
James A. LeGette, Rt. 3, Marion	479 M 4
T. T. Langston, Lee St., Manning	435-8310
H. L. Lee, Jr., Rt. 2, Darlington	332-9298
	Hartsville

DIVISION OF COMMERCIAL FISHERIES

G. ROBERT LUNZ, *Director*
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766-5193 (Home)

NAME AND ADDRESS	TELEPHONE
Allison H. Fickling, Chief, 91 Broad St.—	
Charleston	722-7297 (Office)
1117 Quail Dr. Lawton Bluff	795-0698 (Home)
Lucien F. Bryan, P. O. Box 494, Conway	248-2380
James P. Cooler, Rt. 1, Ridgeland	726-5411
John C. Hodge, Bluffton	757-2371
Kirkland H. Howell, 502 May St.—	
St. George	LO 3-3088 and LO 3-3131

NAME AND ADDRESS	TELEPHONE
D. J. Into, Jr., Star Rt. 1, Hardeeville	2-750
Oscar J. Sullivan, McClellanville	887-3313
Will D. Wheeler, 30 Palmetto St.—	
Georgetown	546-9514
Alexander J. Willis, No. 1 Ackerman Ave.—	
Cottageville	VE 5-2113
Edisto Beach	869-2202

DIVISION OF BOATING

JAMES W. WEBB, *Director*
THOMAS C. WELCH, *Chief of Boating*

CHARLESTON OFFICE, 238 EAST BAY
COLUMBIA OFFICE, 933 MAIN STREET

TELEPHONE RAYMOND 3-7925
TELEPHONE ALPINE 4-2729

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5953 Pol.
\$84.00

Who's Afraid?



This little fox cub looks as if he would like to play with the two pointers inside the pen, the dogs meanwhile being puzzled as to just what the little creature is. (Photo by Brown.)