New Jersey Outdoors

June, 1973

The National Survey of Fishing and Hunting

By Russell A. Cookingham, *Director*

The recently published 1970 National Survey of Fishing and Hunting represents the fourth such survey conducted by the United States Bureau of Sport Fisheries and Wildlife of the United States Department of the Interior—other surveys having been conducted in 1955, 1960, and 1965.

Nationally, there are 169 million people nine years of age or older and of these, 128 million participated in outdoor recreation of some sort. About 49 million fished, about 21 million hunted, and over 16 million did both in 1970. Additionally, over seven million went afield simply to observe animals, while about five million photographed wildlife and over 30 million took nature walks.

Of the 49 million who fished and 21 million who hunted, about 36 million are categorized as substantials who went three or more times, and this includes 33 million fishermen and 14 million hunters. These people expended 7.1 billion dollars in licenses, equipment, and services; traveled 38 billion passenger miles; and, participated in nearly one billion recreation days.

Income from hunting and fishing licenses totaled $192 million with an additional $47 million collected from excise taxes on hunting and fishing equipment. All these monies were used in supporting state programs designed to enhance wildlife populations and wildlife habitat.

Of added interest, the survey showed that one in every three men and one in every nine women in the United States participated in fishing.

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New Jersey Outdoors

New Jersey Outdoors is published monthly by the New Jersey Division of Fish, Game, and Shell Fisheries of the Department of Environmental Protection in the interest of the natural resources of fisheries and wildlife and the betterment of hunting and fishing in New Jersey.

In This Issue

Cover—"Electronics on the Marsh"—*Harry Grosch*

Robert E. Mangold, of the Bureau of Wildlife Management, using a parabolic reflector in conjunction with a tape recorder to help estimate clapper rail populations on a New Jersey marsh. For more on this equipment and technique as well as the clapper rail see page 3.

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Noisy Phantom of the Salt Marsh

The Clapper Rail

By Robert E. Mangold,
Bureau of Wildlife Management

Photographs by Harry Grosch

Who has been on the Jersey salt marsh at sunset in spring or early summer and not heard raucous, clattering calls? And later, perhaps even after dark, these odd sounds come from all around us. Those not knowing may conjure up visions of an Indian scalping party slowly advancing under cover of darkness! Those who do know the source frequently wonder that so much noise can actually originate in so small a bird.

Those who do recognize the call of the clapper rail may spend much time in an often futile effort to catch one glimpse of this furtive dweller of the salt marsh. By remaining quiet and still, one can be rewarded by having a rail or "mud-hen" cautiously peer out of the rank grass or even stalk across a mud flat, impertinently flipping its ridiculous excuse for a tail. I have, while comfortably lying in a sneakbox awaiting a flight of waterfowl, had a rail walk within two feet of my face, peer intently at me, and, apparently having decided I was no threat, continue its search for a fiddler crab along the edge of the marsh.

The "mud-hen" is a very interesting "summer visitor" to our salt marshes. While some may, with luck, manage to survive throughout the winter, most usually winter in a more hospitable climate from South Carolina to Florida.

The clapper rail has been a game bird popular with a small number of hunters in New Jersey for many years. The Division of Fish, Game, and Shell Fisheries has been studying the rail for about 30 years on the Atlantic coastal salt marshes. The present study is funded under the Accelerated Research Program on Migratory Upland Game Birds by the U. S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife. We have found that populations have been in a decline from the highs enjoyed in the 1950's and even the early 1960's.

←— *A clapper rail on its eggs in the nest*

. *Clapper Rail*

Hopefully, the bottom was reached in 1968 and 1969 because in the past few years the spring populations have increased.

Egg Incubation

The rails have intrigued me in many respects, but probably the most intriguing fact relates to incubation of the clutch of eggs. I've always understood that temperature control was critical with incubated eggs; however here is a bird whose eggs normally sustain immersion in tidal water, sometimes for as long a period as two or three hours, and for two, three or four times during the incubation period! If the tides occur early in the incubation period, the eggs, being somewhat heavier than water, sink and remain in the nest (unless, of course, wind blows them out mechanically). If the tides occur late in the period, however, the developing eggs, containing an air space, are lighter, and will float. Under this condition, wind is critical. A slight breeze may not be enough to force the eggs through the canopy of grass woven over the nest by the birds, but in later stages of incubation aything more than a slight breeze can spread these eggs far and wide. Even at that, there is evidence of what may be termed "egg retrieval" by incubating parent birds. An adult rail has been observed replacing an egg which had been removed from the nest.

A clapper rail nest with a more-than-average number of eggs. The usual clutch contains eight or nine eggs

Double Clutching

The rails arrive in the Garden State marshes about the second or third week in April, when their

calls betray their presence. By the second week in May, egg laying is usually initiated. The average clutch is about eight or nine eggs, and it takes the adult about 20 to 21 days to hatch the brood. It has been our experience that the male then takes care of the chicks, at least at night when we have observed them. These are precocious chicks, and before long they are on their own. The hen takes a short "vacation" of about two or three weeks, and when conditions are right (whatever these conditions may be), she begins a second nest, laying one or perhaps two less eggs than found in the first nest. This situation was quite apparent in 1970 when the majority of birds on our study areas had second nests (an estimated 51 pairs had 90 nesting attempts and successfully hatched 88 broods). This apparently has happened infrequently in recent years (or has gone unnoticed), but perhaps this "double clutching" may account for large populations of rails, such as were found in the 1950's and earlier, when is was relatively easy for a hunter to fill his 15-bird daily bag. It seems that weather conditions have to be just about right, with "spring" tides being lower than normal, coming at the right time, and in addition, no severe "northeaster" storms to push tides over the marshes.

Young clapper rails, when first hatched, are a mass of black down

Predator Losses

The rail is usually quite successful in hatching off a complete or nearly complete clutch of eggs, except when storms wash the nests out. On our study areas, located near Tuckerton, predation on eggs

Typical clapper rail habitat in New Jersey marshes

. . . *Clapper Rail*

is almost non-existant on the open salt marsh. When nests are located near the uplands, however, the raccoon does cause some damage. It has been a surprise to me that fish crows and gulls have taken so little toll on rail eggs. I observed one rail nest directly under a utility pole containg a fish crow nest; not one egg was lost.

What happens to the chicks, and even adult rails, may be another matter. I have watched gulls, especially black-backed gulls, pick up adult rails flushed from cover by storm tides, drop, pick up, drop and continue to pick up and drop the rails until the rails were not much more than limp, soggy bodies, after which the gulls flew off! This seemed to be more of a cat-and-mouse game rather than a search for food. Often, a gull swooping over the marsh spots a rail with chicks swimming a tidal creek and picks off one or more of the chicks, or even an adult bird.

Populations

That the rail is able to produce enough young to repopulate the habitat is a matter of record. We are in the process of perfecting a method of estimating how many birds are present in a given area. One way is by counting calls and evaluating what we are hearing. In an attempt to be objective, we are using a parabolic reflector in conjunction with a tape recorder. The reflector acts as a "magnifying glass for sound." It enables

one to locate the direction from which calls originate and increases the number of calls heard. Through the use of the recorder an objective record of numbers of calls is obtained. By relating the number of calls heard during a given period to the number of nesting efforts on a given piece of meadow, an index number can be calculated. Calling can then be used on marshes where the number of breeding pairs is unknown in an effort to obtain an estimate of population abundance. These estimates can be compared, year to year, with a reasonable chance that increases or decreases in rail abundance can be determined.

Banding

Another method of obtaining information about the rail is to capture the bird, place a band on its leg and release it at the point of capture. Then, when the rail is subsequently recaptured or shot, we can learn certain facts of rail life; how long it lived, where it went, when it moved, and perhaps other facts. We've developed a couple of techniques for capturing rails in the spring and summer on our New Jersey marshes which have enabled us to band between 500 and 600 birds each year. From these banded birds we've learned that most rails migrate south at the end of the summer (many move before the hunting season opens!), that they return to the spot they were banded, that they can live as long as five or more years, that those which do migrate apparently spend the winter between central South Carolina and northen Florida, that very few of these birds are shot by our N. J. hunters, and many more similar facts.

Hunters Concentrate

When the September 1 rail hunting season opens, we estimate the

Fiddler crabs, along with marsh crabs, are the staple food of clapper rails

number of hunters, and collect information on the numbers of rails harvested. We've concentrated on the marshes along Great Bay Boulevard near Tuckerton because the heaviest concentration of rail hunters occurs here (and also because I live in Tuckerton!). I've flown over the New Jersey salt marshes on opening day of the rail season between Barnegat Inlet and Egg Island in Delaware Bay, and more hunters were seen on this Great Bay Boulevard area than at any other location. We've gathered data on the numbers of hunters here since 1959, and on the average number of rails harvested by these hunters. The largest number of hunters was counted in 1963, when 283 were seen; the smallest number was counted in 1971, when 17 were seen. The average bag of rails has varied from a low of 0.18 bird per hunter in 1968 and also in 1969, to a high of 3.6 in 1961. In 1971, the average bag was 1.2 on opening day.

Early Departure

We have found, partly through banding and partly through field experience, that many of the adult rails as well as some of the early-hatched young may leave New Jersey before September 1. One rail, banded near Tuckerton, was recovered near Richmond, Virginia, in late August.

Many of the adult rails, as well as some of the early hatched young, may leave New Jersey before September 1 when the rail season normally opens

Since 1967, we have banded a total of 2,155 rails; of these, we have reports of 41 being shot. Of

As the clapper rail continues to increase in abundance, more hunters will probably hunt this interesting game bird

the 41 shot, only six were shot in New Jersey; five were shot in Virginia, 12 were shot in South Carolina, 15 were shot in Georgia, and three were shot near Jacksonville, Fla. These figures, while true, do not reflect an accurate picture of the relative proportions of the harvest, as somewhat less than half of the 2,155 rails banded in New Jersey were banded on the Brigantine National Wildlife Refuge where no hunting was allowed. Even so, perhaps about one-quarter of the birds raised in New Jersey and harvested were actually harvested in New Jersey, with three-quarters harvested in southern states.

Sex And Age

In addition to investigating the reproduction of the rails, attempting to evaluate numbers of birds, capturing and banding, and examining hunting pressure, we are also interested in the physical characteristics of the bird. How do you tell one sex from the other, or a young bird from an adult? Of course, the easiest way is by an internal examination. The condition of the internal reproductive organs will indicate sex and age of the bird. However, this is not particularly practical when one wishes to have the bird remain alive and healthy, so we have been looking at external factors in an

. . . *Clapper Rail*

effort to determine sex and age. Age is relatively easy to judge by using the color and wear of the feathers. Sex can be determined in a high percentage of cases by three measurements; the length of the middle toe from the back of the leg; the length of the top of the bill from the feather line; and the depth of the bill at the external end of the groove in which the nostrils are located. A typical male will have a toe length of 2½ inches or longer; a bill length of 2½ inches or longer and a bill width of 18/64 inch or more. All three measurements will be less on a typical female. When only two of the three measurements are equal to or more than those given, it is probably a male. To date, over 80 birds have been examined since these measurements were arrived at; about 200 were examined before the measurements were determined.

The clapper rail is an interesting game bird and as its abundance continues to increase, more hunters will probably hunt it. Hunters should examine the legs of any clapper bagged as some are banded. Recovery of these banded birds contributes a great deal to our knowledge of this "noisy phantom of the salt marsh." #

Wildlife Management

Two nights of night-lighting woodcock resulted in the banding of 220 woodcock. This cooperative effort between state and federal biologists was less successful this year because of excessive rainfall and lower levels of woodcock use of fields.

Waterfowl censuses on four flight transects on December 18, 1972, revealed a total of 208,799 waterfowl. Compared with a count for December 14, 1971, of 327,048, this year's figure represents a decrease of 118,249 waterfowl. The major changes were recorded in brant, green-winged teal, baldpate, scaup and scoters.

	1971	1972	Change
Total Waterfowl	327,048	208,799	—118,249
Scoters	63,000	2,500	— 60,500
Scaup	56,900	18,900	— 38,000
Brant	53,600	21,400	— 32,200
Green-winged teal	7,900	1,800	— 6,100
Baldpate	7,400	4,020	— 3,380
Black duck	72,503	77,995	+ 5,492
Canada goose	3,580	6,040	+ 2,460

New Jersey's

Satinfin Shiner

By Teddy Schubert,
Public Information Assistant

Familiar as most of us are with the darting little fish in streams and brooks, we seldom go further than calling them minnows or minnies or chubs. One of those silvery little fishies is a rather unique type found only in certain areas of New Jersey and known by the rather pleasant name of satinfin shiner.

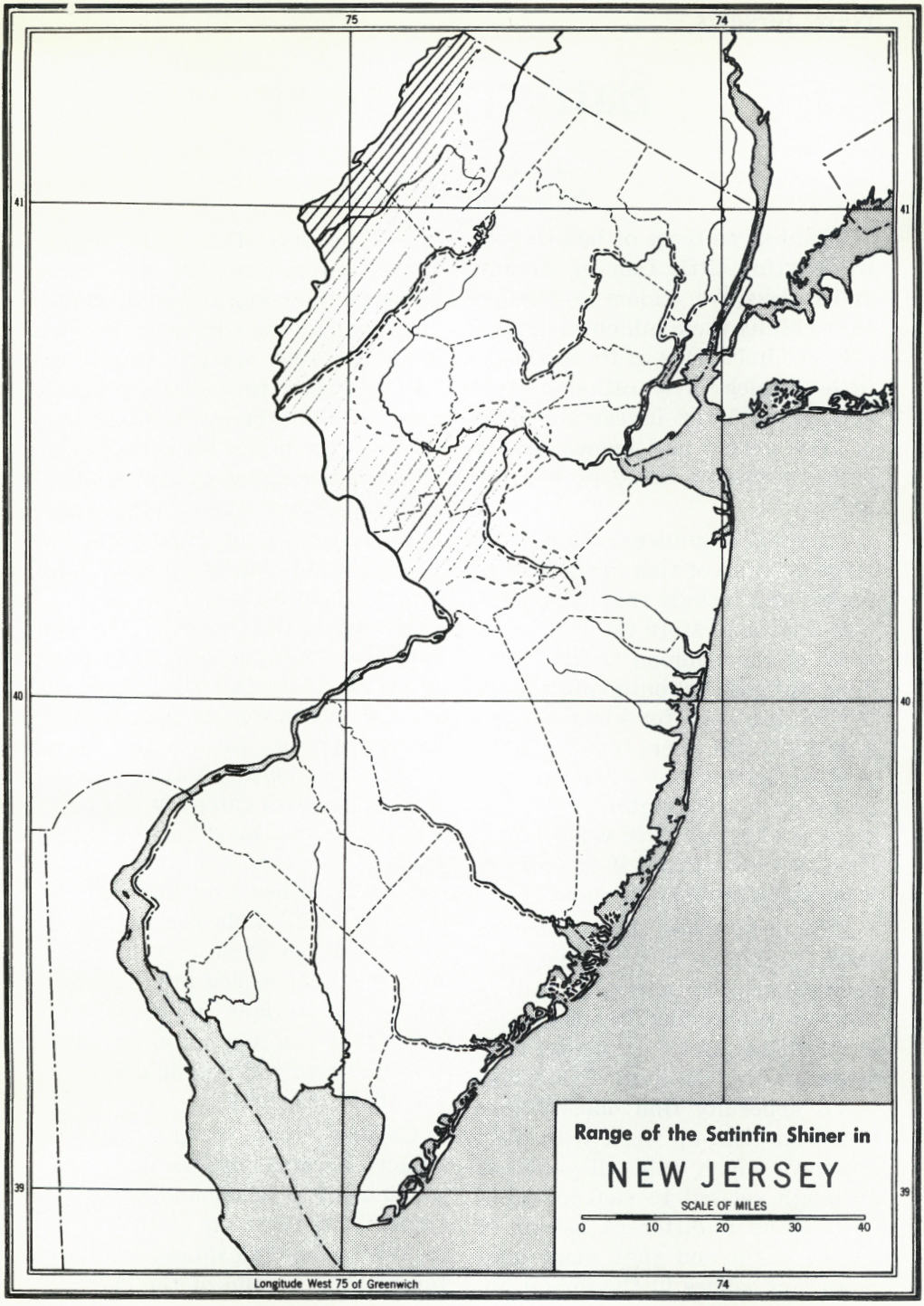
Minnows or shiners comprise the largest group of fish in the United States and include that dandy import the carp. More intriguing are some of the common minnows seldom noticed by outdoors people. It's rather easy for most to spot a white-tailed deer (except when you're deliberately looking for them) or a mockingbird or even a black snake, but when was the last time you even cared if one minnie wasn't the same as the next?

Inhabiting New Jersey are at least 18 different minnows with such descriptive names as cutlips minnow, stoneroller, bridle shiner, and fallfish. And what makes minnows unique? In most fish books you'll generally find observations based on close-up work with dead minnows which will tell you that although related to suckers, minnows have a different set-up of mouth parts and that most minnows lack spines in the dorsal fin.

Getting into this a bit more, literally, real minnows don't have teeth in their mouths. Where else then, would they have them, you ask? Dig this, smarty, they have teeth in their throat! Called pharyngeal teeth, the rows and number of these teeth can be a diagnostic characteristic used to identify various minnows. Pharyngeal teeth may be in one or two rows and usually don't consist of more than five teeth in a row.

Minnows also have a complete series of multiple ribs from their heads to their tail tips. This arrangement, as well as their coarse, muddy-tasting flesh and their small size generally leave them out of the food-fish category although herons, egrets, king-fishers, water snakes, raccoons, and, most of all, predatory fishes find them edible. Not all small fish are minnows, remember, so even if you're not out to eat them, you might like to be aware of their individualities, (except if you're a heron or egret, in which case you wouldn't be reading this). Anyway. . . .

Getting back to the satinfin shiner, the object of this dis-course, we find that a fellow named Girard classified the satinfin scientifically as *Notropis analostanus,* and referred to it as one of the spot-fin


75
74
41
40
39
Range of the Satinfin Shiner in
NEW JERSEY
SCALE OF MILES
0
10
20
30
40
Longitude West 75 of Greenwich

minnows. Now we have another bit of info to tuck away for later use —there are minnows with a spot or spots on their dorsal fin; though the spots are not always easily visible.

The satinfin is a fresh-water minnow and seems to prefer New Jersey's larger streams and rivers, and primarily those flowing into the Delaware River from Trenton north. However, being particular in its habitat, the satinfin thrives in clean streams in flat, fertile, agricultural areas. They seem to avoid small headwater streams. Found in the Pequest drainage of north-western Jersey, satinfins also turn up in the Delaware-Raritan Canal, the Millstone River, and in several streams in Hunterdon, Somerset, and Mercer counties.

There are other minnows of the spotfin clan, such as the spotfin minnow, which sounds redundant, but historically the satinfin was called the eastern satinfin and the spotfin was called the western satinfin, although we are still talking about minnows in the eastern United States. Amen.

The range of our satinfin is listed as coastal drainages from the St. Lawrence to North Carolina. The similar spotfin isn't found in New Jersey at all. However, across the Delaware in Pennsylvania, the satinfin and spotfin hybridize!

And just how do we begat more satinfins? They're egg-layers and usually spawn from May to mid-June in daylight hours. They may even spawn twice during the summer if water temperature and other factors are favorable. No nest is prepared for the eggs, such as bass or bluegills might scrape out of gravelly stream bed. Rather, the eggs are adhesive and when broadcast near submerged logs, stumps, or rocks, stick fast to them. Neither parent fish really cares for the eggs or young in any way except that the male defends the general territory in which the eggs are laid. Normally steel-blue, the males take on a yellowish color during breeding season.

The eggs hatch when they are about 5mm in size, at about 8-11 days. The young are smooth-skinned upon hatching and scales don't begin to appear till the young are 15-16mm long (25.4mm = 1 inch). The first scales grow on the caudal peduncle, the rear of the fish near the tail. Tiny aquatic insects make up the little minnows' diet.

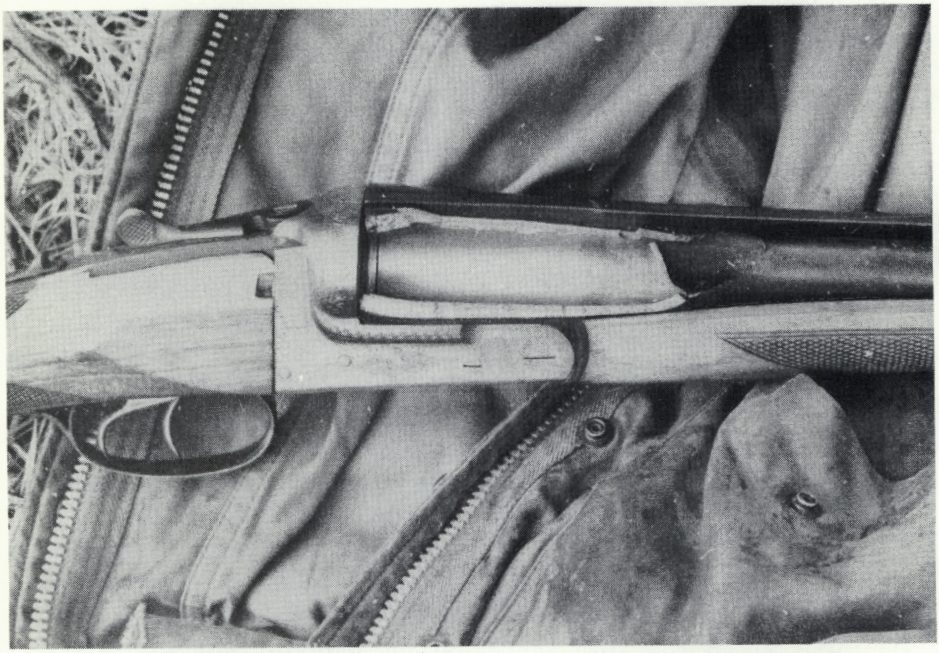
In the world of research and scientific investigations, we find that a fellow by the name of U. B. Stone actually did his doctoral thesis on "Studies on the biology of the satinfin shiners" while at Cornell University! New Jersey Division of Fish, Game, and Shell Fisheries fisheries biologists have also been involved in piscatorial investigations and have found the satinfin in 17 New Jersey streams.

Now go on your way with a new bit of factual fish findings in your unique Garden State and be aware that the next minnow you see may just be our satinfin! #

Use Caution When Reloading

An accidental overload in a hand-loaded shell can cause excessive pressure along the barrel when the gun is fired. The barrel may rupture, resulting in serious injury when metal is blown out of the gun.

When hand-loading always use the specified powder, wad, and shot combinations rather than concocting a presumably more powerful load. Reloading shells is a serious job and should be done carefully and according to specifications. #



This shotgun was blown from an apparent overload of a home-brewed reload that was just too much for the barrel. Excessive pressure may develop if too much or the wrong powder is used, if improper wads are incorrectly seated, or if too much shot is poured in the shell. Needless to say, the correct primers should also be employed. Safety in reloading cannot be stressed or repeated too many times.

Along the vein of the safety line with shotguns—. As has been pointed out for years, the firing of Damascus or other outmoded barreled guns is not a wise thing to do.

The Division's

Land Acquisition Programs

By W. Mitchell Smith,
Wildlife Biologist

Over the years, the state has acquired nearly 130,000 acres of land for public hunting and fishing, all of which started 41 years ago in 1932. At that time, the first tract purchased was the 387-acre parcel in Sussex County, Walpack Township. Known as the Walpack Tract, this was the first tract to be purchased solely for hunters and anglers. Until 1932, all of the areas that had been purchased were used for game and fish propagation. These areas include the Forked River Game Farm, purchased in 1912; the Hackettstown Fish Hatchery, also purchased in 1912; and the Rockport Game Farm, purchased in 1923.

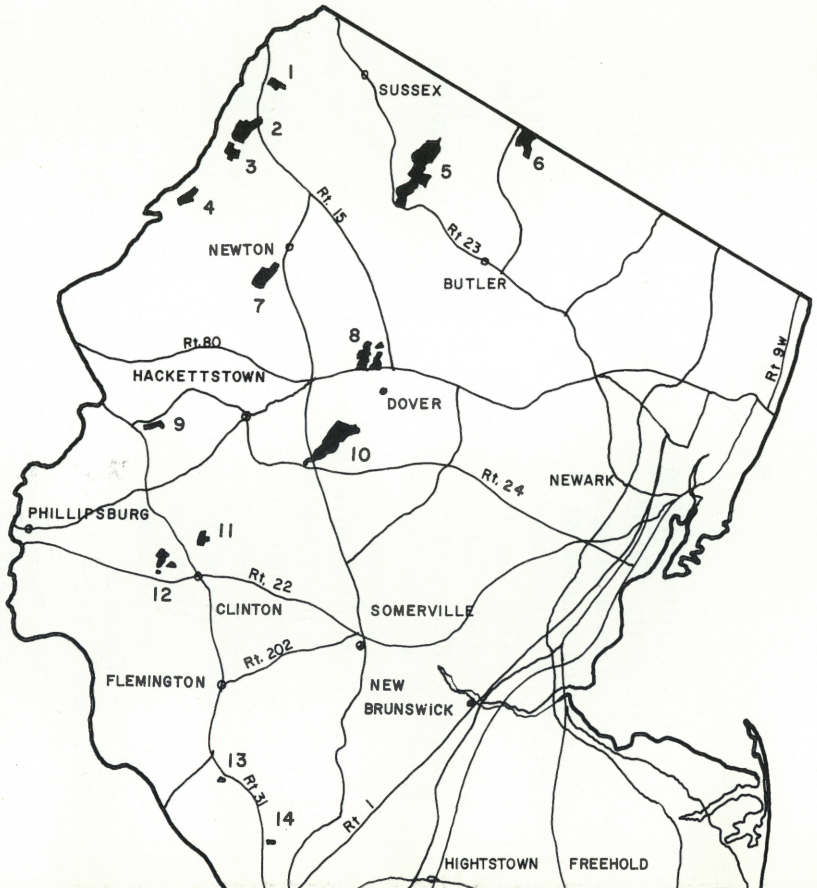
Today the number of public hunting and fishing grounds, now called New Jersey Fish and Wildlife Management Areas, have been increased to a total of 55 areas. They have a combined total of over 129,500 acres and are located in 15 of New Jersey's 21 counties, from Sussex in the north to Cape May in the south. The smallest tract is the Logan Pond area in Gloucester County, containing 11.95 acres; the largest is the Peaslee Tract located in portions of Cumberland, Cape May, and Atlantic Counties, having a total of 14,026 acres. The Fish and Wildlife Management Areas provide not only hunting and fishing sites, but they are also utilized by campers, canoeists, picnickers, boaters, birders, and by many others for a variety of outdoor recreational purposes.

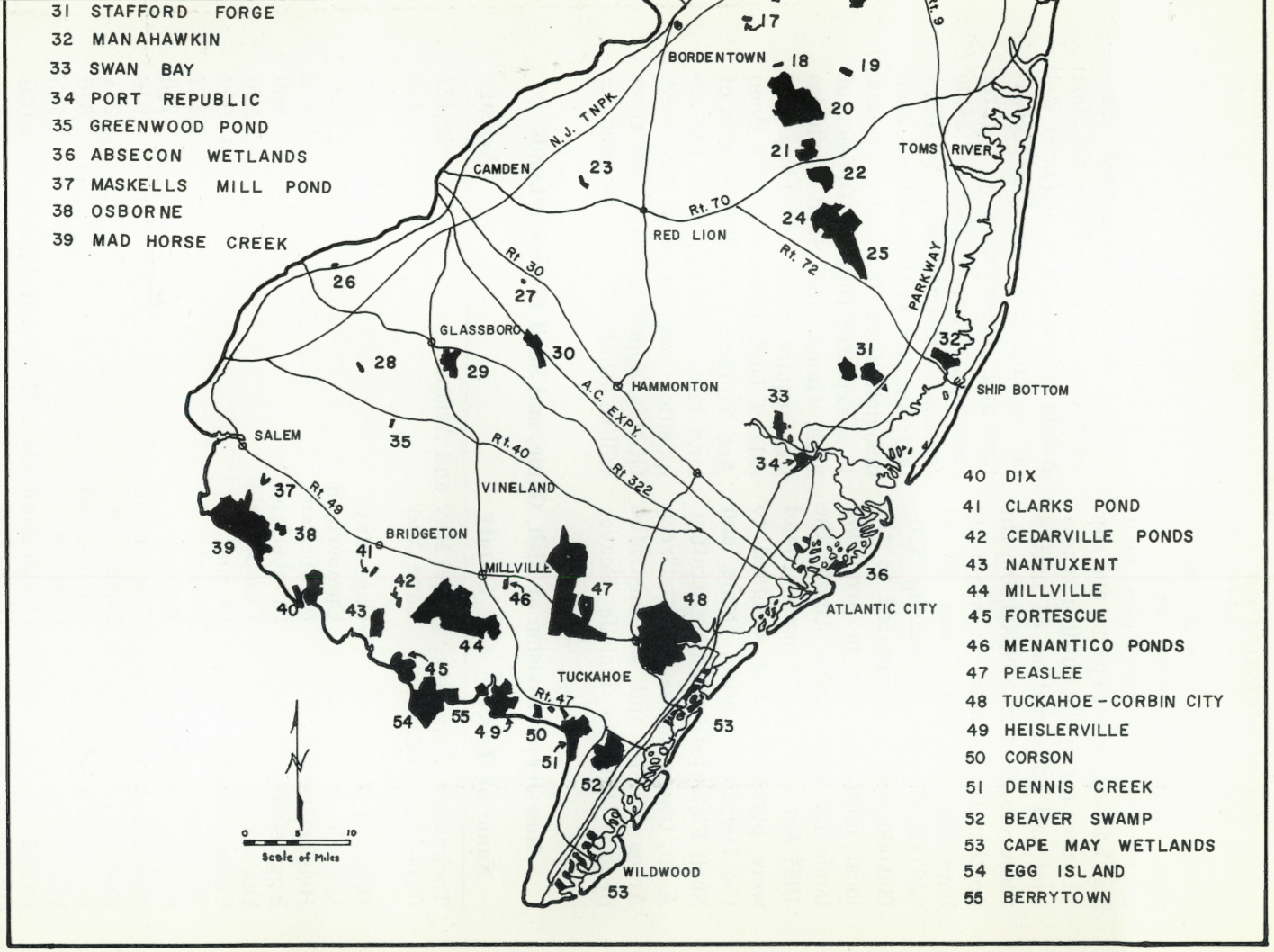
The majority of lands acquired prior to 1961 were purchased with funds from the Public Shooting and Anglers Fund, by the Federal Aid to Wildlife Fund or by gift. Almost 91,300 acres of land were acquired through these funds. Several of the areas obtained in this manner include the Flatbrook, Hamburg Mountain, Glassboro, Clarks Pond, and Menantico Ponds Fish and Wildlife Management Areas.

In 1961, another source of funding became available, the New Jersey Green Acres Acquisition Act. This Act was passed by the legislature in June of 1961 and received approval in the general election of November 1961. Under this Act $60,000,000 was appropriated to the Department of Conservation and Economic Development (now the Department of Environmental Protection) for the acquisition of

NEW JERSEY FISH & WILDLIFE MANAGEMENT AREAS

1 HAINESVILLE
2 FLATBROOK
3 ROY
4 WALPACK
5 HAMBURG MOUNTAIN
6 WANAQUE
7 WHITTINGHAM
8 BERKSHIRE VALLEY
9 PEQUEST
10 BLACK RIVER
11 KEN LOCKWOOD GORGE
12 CLINTON
13 AMWELL LAKE
14 BALDWIN LAKE
15 ASSUNPINK
16 TURKEY SWAMP
17 IMLAYSTOWN LAKE
18 PROSPERTOWN LAKE
19 BUTTERFLY BOGS
20 COLLIERS MILLS
21 MANCHESTER
22 WHITING
23 MEDFORD
24 PASADENA
25 GREENWOOD FOREST
26 LOGAN POND
27 ROWANDS POND
28 HARRISONVILLE LAKE




31 STAFFORD FORGE
32 MANAHAWKIN
33 SWAN BAY
34 PORT REPUBLIC
35 GREENWOOD POND
36 ABSECON WETLANDS
37 MASKELLS MILL POND
38 OSBORNE
39 MAD HORSE CREEK
BORDENTOWN
N.J. TNPK.
CAMDEN
TOMS RIVER
Rt. 70
RED LION
Rt. 72
PARKWAY
Rt. 30
GLASSBORO
HAMMONTON
A.C. EXPY.
SHIP BOTTOM
SALEM
Rt. 40
Rt. 322
VINELAND
Rt. 49
BRIDGETON
MILLVILLE
ATLANTIC CITY
TUCKAHOE
Rt. 47
WILDWOOD
Scale of Miles
40 DIX
41 CLARKS POND
42 CEDARVILLE PONDS
43 NANTUXENT
44 MILLVILLE
45 FORTESCUE
46 MENANTICO PONDS
47 PEASLEE
48 TUCKAHOE-CORBIN CITY
49 HEISLERVILLE
50 CORSON
51 DENNIS CREEK
52 BEAVER SWAMP
53 CAPE MAY WETLANDS
54 EGG ISLAND
55 BERRYTOWN

. . . *Land Acquisition*

land for parks, natural areas, forests, camping, fishing, water resources, wildlife, reservoirs, hunting, boating, water sports, and similar uses for public outdoor recreation and conservation of natural resources. Of this $60,000,000, the portion to be used in acquiring land for the state was set at $40,000,000, the remaining $20,000,000 was appropriated to the local units for use in acquiring lands for open space. Under the 1961 Act, over 38,200 acres of land were purchased and assigned to the Division of Fish, Game, and Shell Fisheries for administration. A few tracts purchased with Green Acres Funds and administrated by the Division include Beaver Swamp, Whittingham, Assunpink, Black River, and the Stafford Forge Fish and Wildlife Management Areas.

In 1971, a second Green Acres Acquisition Act was passed. Basically this Act is similar to the 1961 Act in that the land acquired will be used for public outdoor recreation and conservation of natural resources. That portion set aside for the state program is $40,000,000; another $40,000,000 has been designated for the local programs. It is expected that the Division of Fish, Game, and Shell Fisheries will acquire many additional parcels of land under the 1971 Bond Act. To date, over 23,000 acres of land have been approved for acquisition and are being processed. Of this, approximately 9,000 acres will be assigned to the Division. #

New Jersey Division of Fish, Game, and Shell Fisheries Lands

Name of Tract	County	Acreage
Tuckahoe-Corbin City	Cape May and Atlantic	12,437
Cape May Wetlands (Marmora)	Cape May	4,179
Dennis Creek	Cape May	5,027
Millville	Cumberland	12,035
Heislerville	Cumberland	2,812
Egg Island	Cumberland	4,990
Dix	Cumberland	2,290
Colliers Mills	Ocean	11,962
Wanaque	Passaic	1,412
Pequest	Warren	260
Nantuxent	Cumberland	916
Medford	Burlington	214
Berrytown	Cumberland	1,610
Winslow	Camden	1,715
Peaslee	Cumberland, Cape May, and Atlantic	14,026
Glassboro	Gloucester	2,337

Name of Tract	County	Acreage
Greenwood Forest	Ocean	8,958
Pasadena	Ocean	3,119
Manchester	Ocean	2,376
Whiting	Ocean	1,190
Mad Horse Creek	Salem	5,555
Turkey Swamp	Monmouth	1,855
Berkshire Valley	Morris	1,249
Manahawkin	Ocean	964
Clinton	Hunterdon	1,027
Flatbrook	Sussex	1,947
Hamburg Mountain	Sussex	3,636
Walpack	Sussex	387
Roy	Sussex	287
Hainesville	Sussex	281
Van Nest Refuge	Mercer	98
Butterfly Bogs	Ocean	103
Rowands Pond	Camden	13
Menantico Ponds	Cumberland	295
Clarks Pond	Cumberland	163
Logan Pond	Gloucester	11
Ken Lockwood Gorge	Hunterdon	259
Amwell Lake	Hunterdon	21
Baldwin Lake	Mercer	36
Maskells Mill Pond	Salem	56
Greenwood Pond	Salem	57
Rockport Game Farm	Warren	369
Forked River Game Farm	Ocean	537
Quail Farm	Ocean	288
Hackettstown Hatchery	Warren	233
Port Republic	Atlantic	755
Corson Tracts	Cumberland	446
Osborne	Cumberland	182
Fortescue	Cumberland	894
Beaver Swamp	Cape May	2,675
Harrisonville Lake	Salem and Gloucester	37
Imlaystown Lake	Monmouth	30
Assunpink	Monmouth	2,761
Black River	Morris	2,663
Stafford Forge	Ocean	2,788
Prospertown Lake	Ocean	125
Whittingham	Sussex	1,114
Absecon	Atlantic	638
Swan Bay	Burlington	818
Cedarville Ponds	Cumberland	42
	Total	129,560

Goose Roundup

By Robert Burgoon,
Assistant Refuge Manager

Photographs by Harry Grosch

In the early morning hours of a June day, 60 people gathered at the Brigantine National Wildlife Refuge to participate in the annual Canada goose roundup. Gaylord Inman, Refuge Manager, welcomed the group and explained the procedure. He stated that the Canada geese at the refuge have lost their natural instinct to migrate and that some must be removed each year or all will face a food shortage during the winter months.

To capture the geese the 60 drivers fanned out in an arc around a 1,000-acre fresh-water pond. A corral had been set up at one end of the pond and as the arc tightened, the geese were forced to move in the direction of the pen. By midmorning, with everything having gone according to plan, 449 geese were safely in captivity.

The key to the success of this drive was the 60 volunteers who had to trek through six inches of

water and waist-deep mud. Along with the Brigantine Refuge staff, the participants included Fred Lesser and Pat Slavin of the Ocean County Mosquito Commission; New Jersey state biologists Bill Shoemaker, Lee Widjeskog, and Fred Ferrigno; state conservation officer trainees Robert Klaus, Barksdale Bush, Earl Henderson, and Steve Schuster; the staff from the Great Swamp National Wildlife Refuge; and 28 members of the Brigantine Refuge Youth Conservation Corps.

It was the Youth Conservation Corps that was assigned the task of preventing the geese from swimming around the wings of the corral, a task which they accomplished successfully but not without two of the girls becoming stuck in the mud. After the geese were safely corralled, the two girls, Adrienne Bonosivch and Ruette Watson, were rescued by fellow corpsmen.

The captured geese are transported to other states that are attempting to establish breeding populations and resident flocks. This year 197 were sent to Maine, 150 to Florida, and the rest tagged and released on the refuge. #

Through the morning mist, opposite, the signal is given and the goose drivers start out, swimming and sloshing through the marsh

The drivers, below, herd the geese toward the pens

After the geese are corralled and the entrance to the pen is closed, the drivers admire the handsome birds

Fred Ferrigno of the Division's Bureau of Wildlife Management catching birds to be crated

State of Maine game technician James Dorso crating geese to be transferred to Maine

In minutes 197 geese were crated and loaded on State of Maine trucks for immediate trip to Maine

. . . *National Survey* *Continued from Inside Front Cover*

Comparable figures for hunting indicated one in every five men and one in every 94 women.

Increases in hunting and fishing recreation in the five years from the 1965 to 1970 survey indicated that the number of male fishermen increased 15 percent and female fishermen by 23 percent. The number of male hunters increased by about 5 percent and female hunters by 12 percent.

For the first time in the four surveys, salt-water fishing did not expand at a faster rate than fresh-water fishing. However, both of these activities escalated faster than the increase in people 12 years of age or older in the United States.

Many conclusions can undoubtedly be drawn from these statistics, but to state simply the broad implications of this study: fishing and hunting involve three-fifths of those participating in outdoor recreation, and interest in these activities, especially fishing, appears to be increasing at a more rapid rate than the population increase. The demands on resource agencies become obvious if quality environments (lands and waters) are to be provided and properly managed to allow for the expanding level of public participation in hunting and fishing. #

Reference: 1970 National Survey of Fishing and Hunting
U. S. Government Print Office, Washington, D. C.
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The Ailanthus

(Ailanthus altissima)

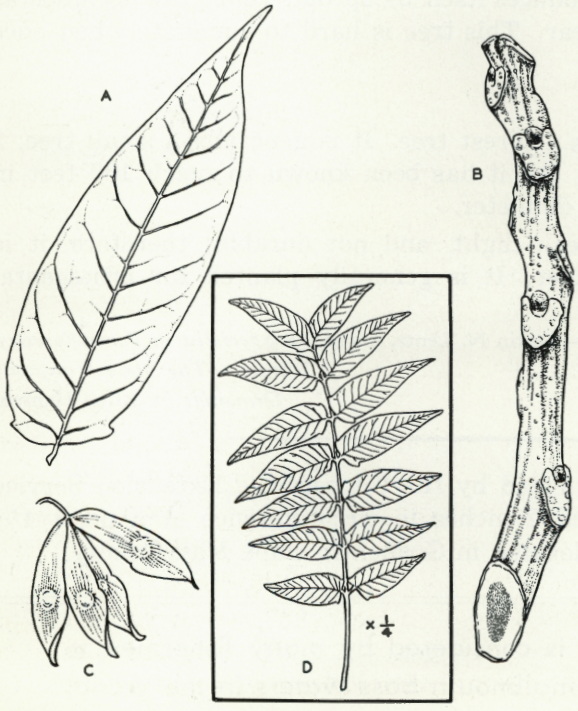
Ailanthus is sometimes known as the tree-of-heaven, Chinese sumac or copal tree. This tree flourishes in poor soil and severe smoke conditions of industrial cities. It is the tree referred to in, "A Tree Grows in Brooklyn."

Range:

This tree has been cultivated and widely naturalized over the Eastern, Central, Southwestern, and Pacific Coast States. It is a native of China.

Leaves:

Alternate, compound, 1 to 3 feet long, comprised of 11 to 41 ovate-lanceolate leaflets. (See figure D.) Leaflets are 3 to 5 inches long, having almost an entire margin, except for several large teeth near the base. (See figure A.) On the underside of the leaf, glands may be present near the base. These glands, when crushed, emit a very disagreeable odor; therefore, the name "stink-tree" is sometimes used.



Ailanthus

A. Leaflet

B. Twig

C. Fruit

D. Leaf

. . . *Ailanthus*

Twigs:

Stout; yellowish-green; prominent leaf scars, brown pith. The twig is covered with a fine velvety down and prominent scattered lenticels. (See figure B.)

The terminal bud is absent. Small, one-eighth of an inch lateral buds are snuggled in the crotch above the leaf scars.

On young trees the bark is smooth and light gray with small fissures. On old trees the bark turns dark and becomes roughened with diamond-shaped fissures.

Flowers:

The male and female flowers appear on different trees, usually about June. They occur as small, green, individual flowers arranged in panicles. Male flowers have a very disagreeable odor.

Fruit:

A one-celled, one-seeded, oblong, thin, spirally twisted samara, one inch to one and one-half inches long, readily disseminated by the wind. (See figure C.) The seed ripens and turns brown during September and October.

This tree readily reproduces itself by sprouts that grow as much as 6 to 12 feet in one year. This tree is hard to eliminate when once established.

Uses:

It is not important as a forest tree. It is generally a small tree, 1 to 2 feet in diameter, but it has been known to reach 100 feet in height and 3 feet in diameter.

The wood is soft, weak, light, and not durable; therefore, it is seldom used for lumber. It is generally planted for ornamental purposes.

—Austin N. Lentz, *Extension Specialist in Farm Forestry,*
Rutgers—*The State University*
Drawings by Aline Hansens

The largest ailanthus listed by the Cooperative Extension Service of New Jersey, 15 feet and 2 inches in circumference at a point 4½ feet above the ground, is located in Goshen in Cape May County.

The Delaware River is considered by many fishermen to be one of the best smallmouth bass waters in the world.

Dove Study Project

By Robert E. Mangold,
Bureau of Wildlife Management

Photographs by Harry Grosch

The mourning dove has one of the widest distributions of any game bird in this country, being found in every state of the continental United States, in southern Canada, Mexico, and Central America. The dove nests in numbers in all states; however, in Maine, New Hampshire, and Vermont, the numbers are low.

Because the dove is migratory, primary responsibility to maintain the resource is vested in the United States Fish and Wildlife Service. In order to have some idea of nationwide as well as individual state populations of doves, an annual survey of the breeding population is used to provide an index to the status of the population. This survey, made nationwide by Federal, state, and independent observers, consists of a standarized call-count run between May 20 and June 10, a period when dove calling activity is relatively stable. In all states except Maine, New Hampshire, Vermont, and Rhode Island, the survey has been run since 1953, and in those four states since 1959.

The call-count index is composed of the average number of calls per route times the estimated habitat type on a state-wide basis. The product of this multiplication is called the breeding density index. In New Jersey three comparable routes are annually run. Each route is 20 miles long with listening stations one mile apart. Call counts begin one-half hour before sunrise and continue for two hours. Limitations include: 1. Results are an index of annual changes in numbers of breeding doves, not a population census. 2. No information is uniformly collected on annual production. 3. Little information is available on the relationship of the call-count index to actual dove populations.

In 1970, New Jersey had one of the highest numbers of calling doves per route on record in the state. Also of note is the fact that the 1970 New Jersey calling dove index was the sixth highest in the nation. The breeding density index has indicated a rather noticeable increase in doves in New Jersey over the past two decades. Call counts in 1953 were less than 10 per route, with the 1970 count being 32.9 calls per route.

The framework of Federal hunting regulations are set on the basis of the results of the annual call-count survey which reflects trends in the population. In the 1970-71 hunting season, 16 of the 27 states

. . . *Dove Study*

in the Eastern Mourning Dove Management Unit had open seasons. These states, roughly from Pennsylvania southward, enjoyed a 70-day season with a 12-bird daily bag. Shooting hours were from 12 noon until sunset. The open season in Pennsylvania was from September 1 to November 9, while the open season was split in the rest of the southern states in the Eastern Mourning Dove Management Unit. All of the southern states took advantage of the split season to harvest local production in the early season, and migrants from northern states in the late season. States with closed seasons in the Eastern Unit are from New Jersey northward (except Rhode Island), and Ohio, Indiana, Michigan, and Wisconsin. Because the dove migrates shortly after termination of the breeding season, the date of opening of hunting seasons is set early to take advantage of large populations. However, a small proportion of the adult population is still nesting or feeding young doves by September 1. This segment of the population has been estimated to be about 10 percent of the adults.

The goal of the mourning dove program is to maintain maximum security for the species, allow recreational use by bird-watchers, as well as provide a sustained annual harvest by hunters. The dove is a game bird in 31 of the 50 states with a steadily increasing bag in

Russell Spinks of the Division's Bureau of Wildlife Management carefully and gently bands a dove

Russell Spinks releases the banded dove. Notice the baited trap holding another dove ready to be banded and released

recent years. In 1942 the nationwide bag was estimated at about 11 million, in 1949 about 15 million, in 1961 about 30 million, and in 1965 nearly 42 million. This increase in reported harvest is probably a combination of several factors; better information on dove harvest, and better methods of harvest. It should be noted that the increasing harvest has been carefully compared with dove production, so as to maintain the population for both non-consumptive users, such as bird-watchers, and for consumptive users, such as hunters. The dove, as well as such species of waterfowl as the wood duck, provide excellent examples of good management of a resource. In both cases, only the surplus production is harvested by hunters, leaving more than an adequate breeding population.

While we, unfortunately, do not have a dove-hunting season in New Jersey, we do contribute information to the United States Fish and Wildlife Service for use in evaluating population changes. We make three randomly selected call-counts. The Bureau of Wildlife

. . . *Dove Study*

Management, funded by the federal Accelerated Funds program also traps and bands doves at eight locations throughout the state.

The eight locations were all at state installations such as wildlife management areas (see Table 1). trapped and banded. The recoveries of banded doves are interesting (see Table 2).

During 1971, we received reports of 74 doves recovered; of these, five had been originally trapped and banded in 1968; 17 in 1969; 41 in 1970, and 11 in 1971 (see Table 3). It is interesting to note

Table 1. Summary of Doves Caught During 1971 Dove Study Project

Area	Jan.	Feb.	Mar.	Jun.	Jul.	Aug.	Totals
Flatbrook				15	23	21	59
Whittingham	4			45	46	28	123
Black River				148	300		448
Assunpink			32		29	80	141
Colliers Mill					26	10	36
Tuckahoe	11	9	45	10	13	8	96
Millville		11					11
Nacote Creek		41	41		68	25	175
Totals	15	61	118	218	505	172	1,089

During 1971 at these trapping locations, a total of 1,089 doves were banded. During 1970, a total of 1,297 were banded, and during 1969, a total of 1,651 doves were that of the 74 band recoveries, 11 came from doves shot by hunters in eight different states, and as far away as Kansas. Table 3 also indicates that 54 were retrapped

Table 2. Summary of Banded Doves Recovered During Dove Study Project

Year Banded	Number Banded	Recovered in Year		
		1969	1970	1971
1969	1,651	9	63	17
1970	1,297		14	41
1971	1,089			11
				5*

* Also recovered five doves banded in 1968.

and released, nearly all in exactly the same locations as when first banded. Some of these recaptures were doves banded three years earlier.

It must be kept in mind that the data in Table 3, while complete, is only part of the total picture. no more bands are recovered. This may take a period of six or eight years, as doves are known to live for five or six years at least.

If the banding effort continues over the years, more information will accumulate, thus increasing our fund of knowledge about how

Table 3. Summary of Banded Doves Recovered in 1971 During Dove Study Project

Year Banded	Number	How Recovered
1968	1	Shot in Georgia
1968	1	Flew into object in New Jersey
1968	3	Retrapped in same area in New Jersey
1969	1	Found dead in Pennsylvania
1969	1	Dead on road near trap site
1969	1	Shot in North Carolina
1969	14	Retrapped in same area in New Jersey
1970	1	Caught alive and released in New Jersey
1970	2	Found dead in New Jersey
1970	3	Shot in Delaware, South Carolina, Kansas
1970	35	Retrapped in same area in New Jersey
1971	1	Killed by cat in New Jersey
1971	2	Found dead in New Jersey
1971	2*	Retrapped in same area in New Jersey
1971	2	Shot in Pennsylvania
1971	2	Shot in Maryland
1971	1	Shot in Georgia
1971	1	Shot in Virginia
	74	

* Minimum as not all returns have yet been tabulated.

These data were collected in just one year. To increase the fund of information which could obtained, several years' data could be used. Another approach might be to follow the complete set of bandings for any one year, i.e., 1970, until long our Jersey-hatched doves live, where they spend their winters, how many of them return to the same place, how many are shot, and many other pieces of the jig saw puzzle which constitutes their existence. #

Dix Area

The Dix Fish and Wildlife Management Area is located in Cumberland County and comprises a total of 2,290 acres, of which approximately 75 percent is marshland and the remaining 25 percent equally divided between hardwood forest and farmland. The tract is located adjacent to the Delaware River, south of the Cohansey River, 6 miles west of Fairton on Back Neck Road.

A portion of the tract, 913 acres, was purchased in 1962 with federal aid to wildlife funds. The remaining area was purchased under the Green Acres Program and then assigned to the Division. The principle wildlife species are pheasants, rabbits, quail, grouse, woodcock, and deer.

Waterfowl

The area offers excellent opportunities for hunting black duck, mallard, pintail, and geese. There are several creeks and river frontages where the wildfowl enthusiast will find good hunting. Accessibility at the present time is limited, with the launching sites located on privately owned land.

Upland Game

The upland area of this tract is managed for rabbits, pheasants, and quail. Wildlife food plots and food bearing shrub hedgerows have been established and will be maintained to provide habitat for the wildlife species present. The Division's stocking program provides additional game through pre-season and in-season releases of pheasants and quail.

Deer

There is a small deer herd on this area offering opportunities for both firearm and archery enthusiasts.

Fishing

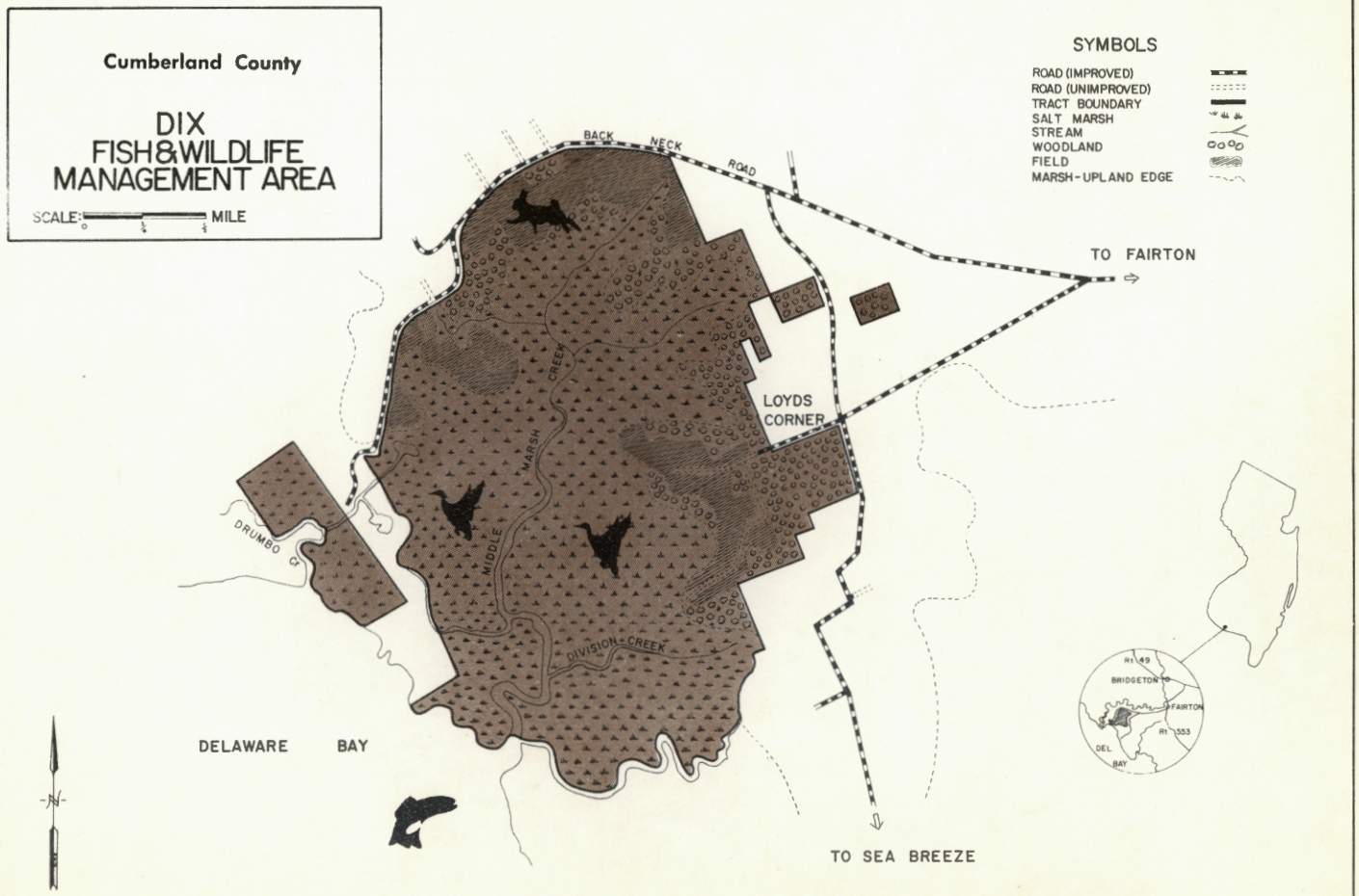
Salt-water fishing opportunities are very good in the streams and creeks within the tract and in the Delaware River. Striped bass and white perch are the major species of fish present.

Trapping

The mink and muskrat populations on the area offer trapping opportunities during the winter months.

The tract is maintained and supported by sportsmen's license money. #

—William M. Smith,
Bureau of Wildlife Management


Cumberland County
DIX
FISH & WILDLIFE
MANAGEMENT AREA
SCALE: 0 ¼ ½ MILE
SYMBOLS
ROAD (IMPROVED)
ROAD (UNIMPROVED)
TRACT BOUNDARY
SALT MARSH
STREAM
WOODLAND
FIELD
MARSH-UPLAND EDGE
BACK NECK ROAD
TO FAIRTON
LOYDS CORNER
CREEK
MIDDLE MARSH
DRUMBO CR
DIVISION CREEK
DELAWARE BAY
TO SEA BREEZE
N
Rt 49
BRIDGETON
FAIRTON
Rt 553
DEL BAY

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Littered waters make it dangerous for fishing, swimming, and boating.

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The quality of fish goes down as the water becomes littered. Trout require a clean, cold environment; black bass can tolerate warmer water, but there is a definite limit to the amount of contamination they can tolerate.

And, don't forget, angler's luck can be spoiled when below-the-waterline rubbish fouls up the lines !

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