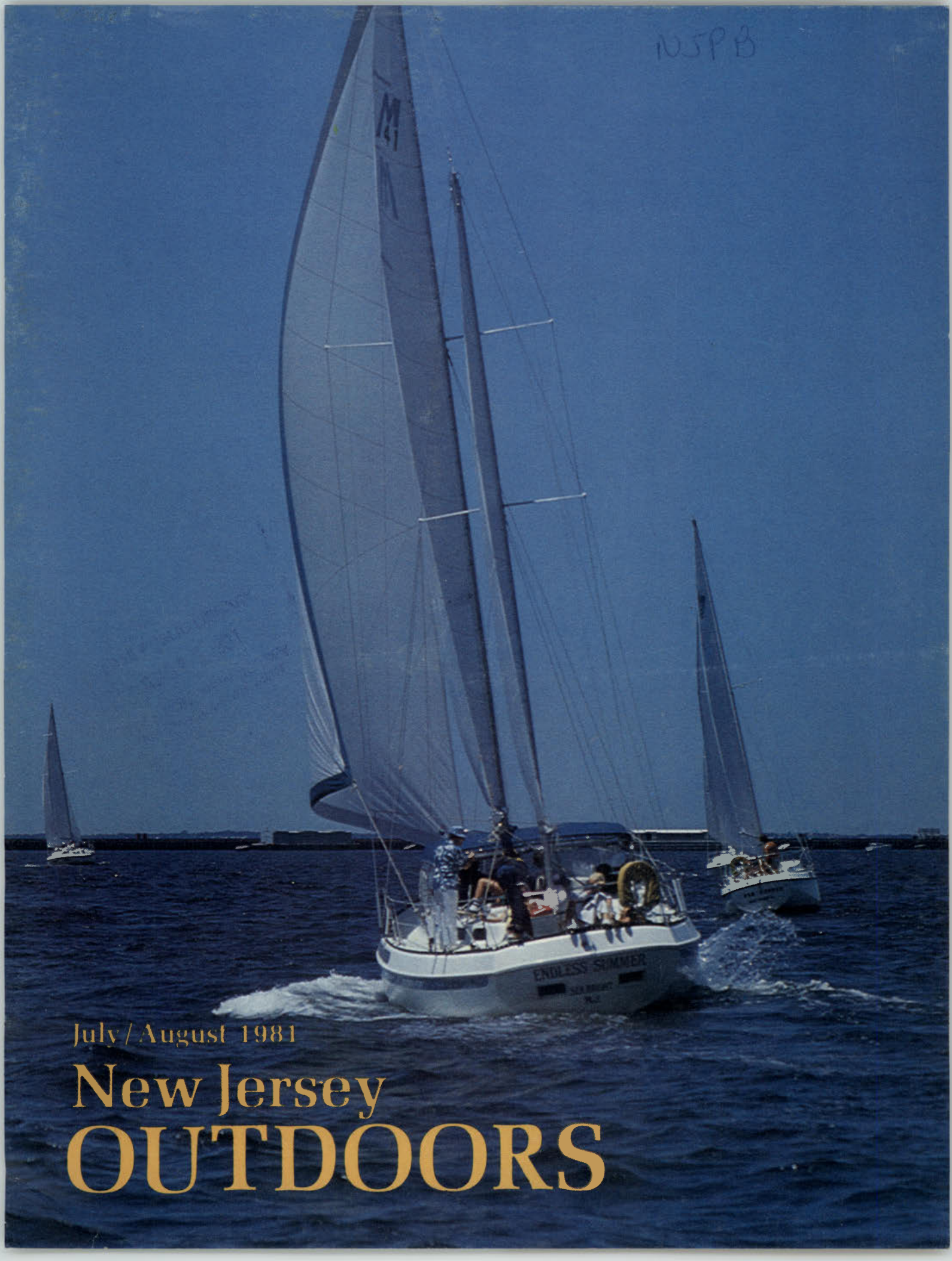

July / August 1981

New Jersey OUTDOORS

NEW JERSEY OUTDOORS is the bi-monthly magazine of the Department of Environmental Protection of New Jersey. This publication is dedicated to the wise management and conservation of our natural resources and to foster a greater appreciation of the outdoors.

(Note: Costs of publishing the magazine not covered by subscriptions are met from general revenues available to the Department of Environmental Protection.)

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July/August 1981
VOL. 8 NO. 4

New Jersey OUTDOORS

From The Editor

fun in the sun in New Jersey

We are indeed fortunate in this small state to be able to enjoy a marvelous mix of recreational resources all "just down the road a piece." And many of these resources are free, although there are some modest fees for camping, parking, etc. And where can you get this information?

- Vacation Guide titled, "New Jersey's Got It" and other recreational publications are available from:
  New Jersey Division of Travel and Tourism
  CN 384
  Trenton, NJ 08625
  (609) 292-2470
- A year-around guide, "New Jersey Invites You To Enjoy its State Forests, Parks, Natural Areas, Marinas, Historic Sites, Wildlife Management Areas" is available from:
  Division of Parks and Forestry
  State Park Services
  CN 404
  Trenton, NJ 08625
  (609) 292-2797
- A new publication called, "Canoeing the Pinelands Rivers" is available from:
  Green Acres Program
  Bureau of Recreation and Heritage Planning
  CN 404
  Trenton, NJ 08625
  (609) 292-2455
- For the more adventurous, a set of 10 recreation maps (plus canoe safety information) of the Delaware River is available for a fee of $4.00 from:
  Delaware River Basin Commission
  P.O. Box 7360
  West Trenton, NJ 08628
- For those looking for recreation on the wild side, send for the:
  Wildlife Management Area Guide
  Division of Fish, Game and Wildlife
  CN 400
  Trenton, NJ 08625
  (609) 292-9450

This is a 122-page guide of New Jersey's wildlife management areas—over 150,000 acres of diversified habitat (forests, meadows, salt marshes, lakes, and mountains) scattered throughout the state. The guide contains maps, roads, and directions. It sells for $4.00. If you wish the guide sent first class, send an additional $1.50 postage.

- The next issue, September/October, will feature two articles on recreational resources: *N.J. Zoos* and *N.J. Rivers.*

In this issue:

The color photograph of *Lucy* on the back cover introduces the article, *Lucy —The Margate Elephant* by writer/photographer Richard L. Ditch.

Continuing with our series on saltwater fishing, Bill Figley and Ray Townsend have compiled data on four saltwater species: Bluefin Tuna, Summer Flounder, Sea Bass, and Tautog.

Mary Ann Foote, a new author with a sense of humor, asks the queston: *What Do Ecologists Do?* Illustrations were provided by Tony Hillman.

Saltwater fisherman Peter Barrett is back with *Diamond Jigs . . . . .An Old-Time Lure Rediscovered.*

A new author, Cornelius Hogenbirk, relives a bit of history in the article, *Historic Twin Lights in the Highlands.* Mr. Hogenbirk, a retired New Jersey native, was a U.S. Army Signal Corps photographer assigned to the Yokohama War Crimes trials.

I get so many excellent slides from a great many dedicated outdoor photographers in our small state, and every so often I put together a picture spread, *The Jersey Shore,* to show our readers that New Jersey is more than the New Jersey Turnpike.

Another new author, P.J. Emaus, writes about *The Lower Passaic /Polluted but Still Alive.* The writer grew up along the river and says, "I never really left the river, and now I return quite frequently for many memories linger there . . ."

In the article, *Fishing Fashions,* author Eileen M. Van Kirk instructs her sister anglers what to wear to make that fishing trip an enjoyable day. Illustrations were provided by Tony Hillman.

Ilustrator Gene Feller has provided us with an illustrated article titled, *Water Safety.* The article discusses water safety courses such as swimming, lifesaving, canoeing, rowing, sailing, etc. and lists addresses for other information.

N.J. Girl Scouts Are Introduced to our Marine Resources was written by Janis Martin-Hughes with collaboration by Barbara Church. Author Martin-Hughes is a free-lance writer/photographer from Deptford, New Jersey. Ms. Church is Outdoor Education Director for the Burlington County Girl Scout Council and Project Director for a New Jersey Sea Grant Program.

Writer/photographer Jeanne Quinn has provided us with a pictorial story about "an island of peace in South Jersey" with 27 colorful gardens. The place: *Leaming's Run Botanical Gardens.*

Our Wildlife in New Jersey series is introduced by the Carol Decker illustration on the inside back cover, titled *Bats.* The author is nongame biologist Debra Morris of DEP's Division of Fish, Game and Wildlife. No, they don't become entangled in you hair.

Author Ferd DiPalma is back with another deep sea fishing adventure titled, *Hudson Canyon and Beyond.*

Fisheries biologist Michael Welshko updates the Lake Trout Program in Round Valley Reservoir. Trout fishermen in New Jersey are waiting for the green light.

Two new authors, Mickey Coen and Shaun O'Rourke tell us about *Canoeing the Marshes of Ocean County.*

Steve Perrone

LUCY The Margate Elephant

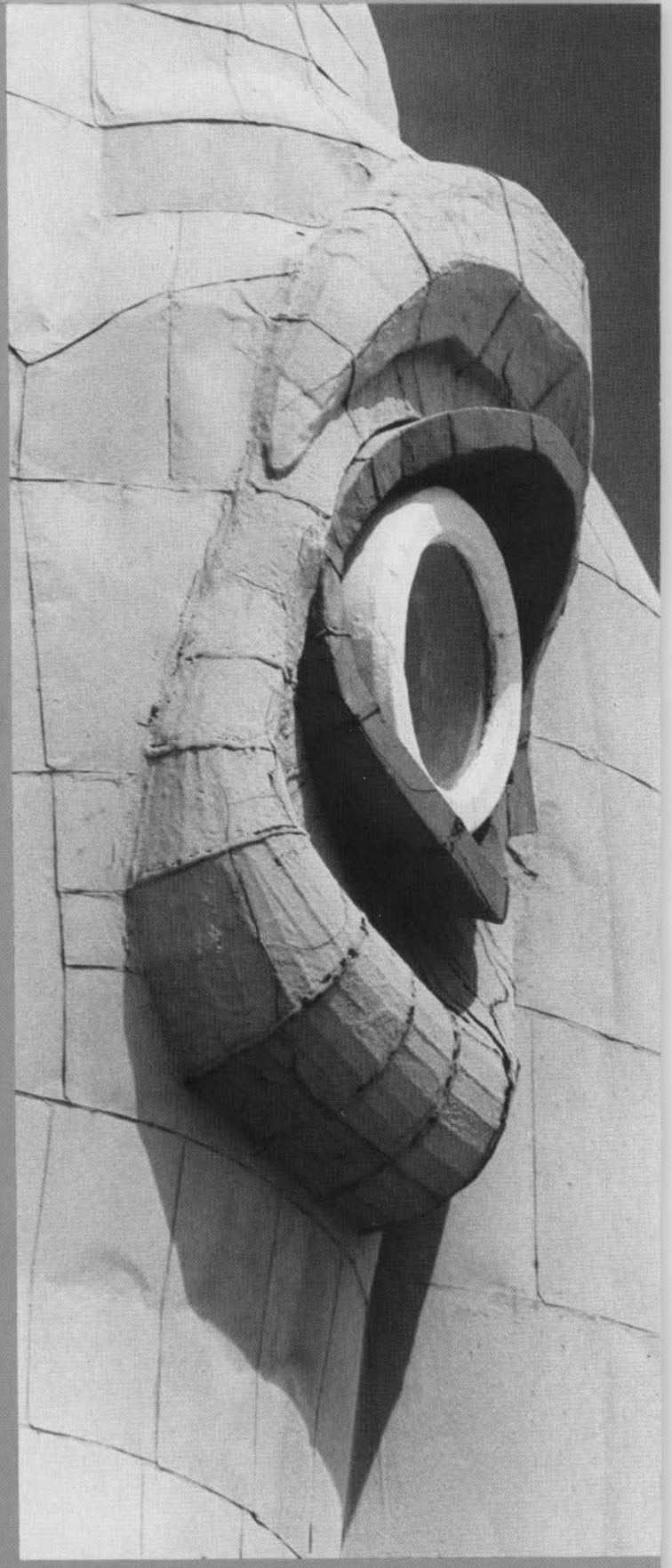
BY RICHARD L. DITCH

For almost a century, Lucy has stood watching over the New Jersey shore south of Atlantic City. She has come to be known, and even loved, by a wide assortment of people during her long vigil. This "architectural folly" is truly a unique example of America's Victorian era.

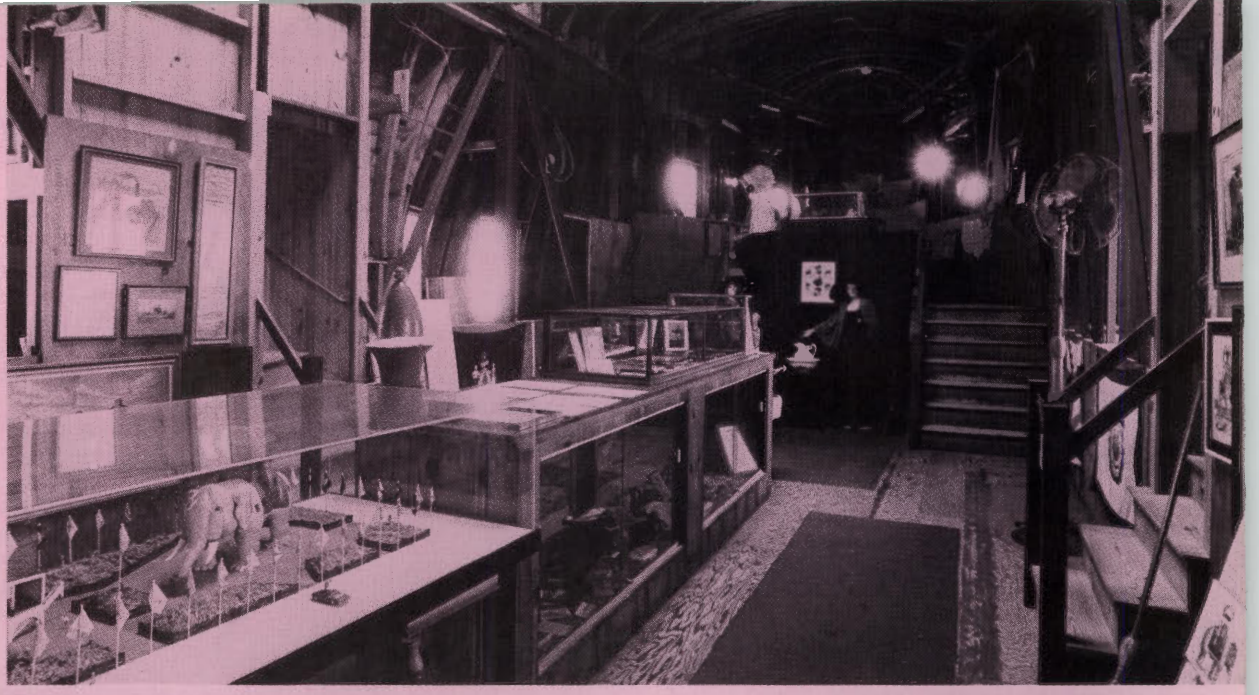
Lucy was built in 1881 by James Lafferty, a land promoter from Philadelphia. At this time, the Margate area was known only as South Atlantic City, and consisted mostly of sand dunes, shrubs, and pine trees. Lafferty's advertisements in the Philadelphia Public Ledger of the time teased his potential land buyers with references to "A novel feature in architecture is the erection of a restaurant in the form, shape and anatomy of an elephant, which is the only building of the kind in the world." Other advertisements gave Lucy's dimensions as "86 feet long, 29 feet wide and 65 feet high, 10 feet diameter of legs, 22 feet from platform to floor of hall, 15 feet depth of foundation." It is not surprising that Lucy cost Lafferty about $38,000, an astounding sum in 1881.

To preserve the uniqueness of his building, Lafferty took the surprising step of applying for a patent on an invention of "a building in the form of an animal the body of which is floored and divided into rooms, closets, etc., and the legs contain the stairs which lead to the body, said legs being hollow." To his general description of Lucy, Lafferty also added "The building may be of the form of any other animal than an elephant, as that of a fish, fowl, etc." Astonishingly, on December 5, 1882, the United States Patent Office granted Lafferty Patent No. 268,503 for his "invention."

Constructed of more than a million pieces of wood, including a frame of huge "12 by 12's", and covered by a skin of tin sheeting, Lucy has survived the rough weather of the years remarkably well. Her 90 tons withstood a violent storm in 1903 that drove her to her knees in sand. Another storm in 1928 ripped off her observation deck, or "howdah." She has been moved intact twice: the first time following the storm of 1903;

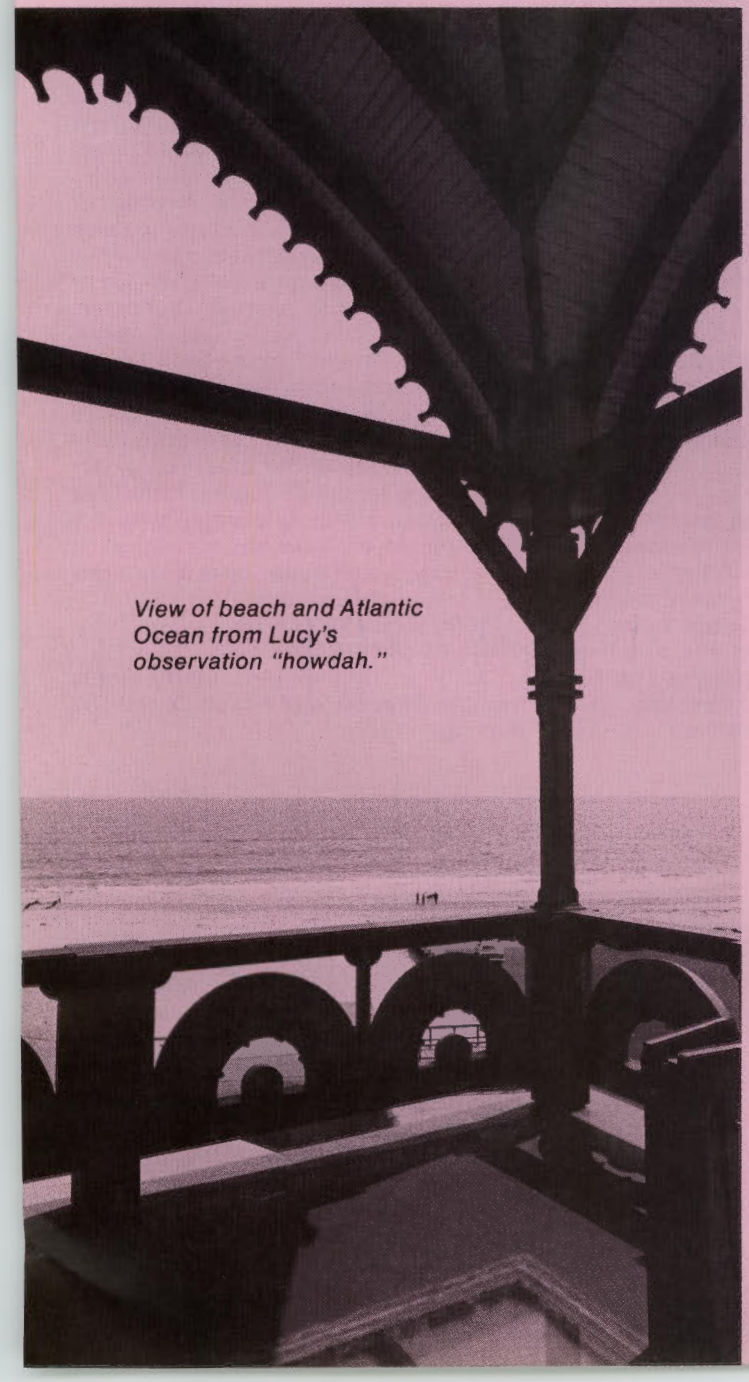


Detail of Lucy's eye, which is actually a window looking out on the Atlantic Ocean.



View of museum located inside Lucy's "belly," showing extensive memorabilia of Lucy's past.

PHOTOS BY AUTHOR



View of beach and Atlantic Ocean from Lucy's observation "howdah."

Closeup of Lucy's right front foot.

most recently in 1970 to her present location at 9200 Atlantic Avenue.

The unique historical value of Lucy is widely recognized. The United States Department of the Interior has designated Lucy as a National Historic Landmark. She is listed on the National resister of Historic Places, and on the New Jersey Historic Register.

Unfortunately, all is not well with Lucy. She fell into a sorry state following World War II, and was closed to the public by the early 1960s. It is only through the dedicated efforts of concerned citizens who formed the nonprofit "Save Lucy Committee" that she is in such relatively good shape today. Her exterior has been completely restored, through worldwide donations, and State and Federal grants. Yet to be finished are the interior spaces and exterior landscaping. Tax-deductible contributions are welcomed by

Save Lucy Committee, Inc.
P.O. Box 3000
Margate, N.J. 08402 □

BLUEFIN TUNA

BIOLOGY

Common names: ***bluefin tuna, horse mackerel, great albacore, tunny***
Scientific name: ***Thunnus thynnus***
Range: Warmer parts of the North Atlantic as far north as Newfoundland.
Size: Bluefin tuna can reach a length of 12' to 14' and a weight of 1000 to 1500 lbs. They may attain an age of 25 years. Age/weight relationship: 1 year = 5 to 14 lbs., 2 years = 15 to 30 lbs., 3 years = 30 to 50 lbs., 4 years = 50 to 85 lbs.
Food: Basic food is primarily smaller fishes, especially the schooling type—herring, mackerel, silver hake—and squid and shrimp.
Migration: Bluefin tuna in the Northeast Atlantic congregate in the Caribbean and Gulf of Mexico during winter and migrate northward as spring advances.
Habitat: They are oceanic wanderers.
Spawning: Spawning occurs in the Gulf of Mexico; the time is uncertain. Bluefin tuna mature at 5 years at a weight of 100 lbs.

RECREATIONAL AND COMMERCIAL IMPORTANCE

Historically, sport catches of bluefin tuna off New Jersey have been dominated by small school tuna. The National Marine Fisheries Service estimated that sport catches of bluefin were 13,200 in 1975, 1300 in 1976, 557 in 1977 and 860 in 1978. Sport catches were reportedly much greater in the past, but overfishing by US tuna clippers severely reduced tuna stocks. Occasionally, small numbers of giant tuna are taken by anglers in the Mud Hole.

Commercial bluefin landings in New Jersey were small until 1963, when purse seiners began fishing in the North Atlantic. As many as 21 tuna clippers from the US and Canada were involved in the fishery during the 1960s. This highly efficient fleet, using spotter airplanes to locate tuna schools, quickly depleted bluefin stocks and by 1975 an international commission of tuna fishing nations adopted quotas to limit tuna landings. The current fishery consists of 2 or 3 Canadian and 4 US seiners. It is anticipated that reduced commercial landings will allow tuna to rebuild their numbers.

SPORTFISHING FACTS AND TECHNIQUES

Bluefin tuna are extremely fast and tenacious fighters, requiring heavy conventional reels and tackle. Bluefin range in weight from less than 10 to more than 1000 pounds, so anglers have to gauge the size of their tackle by the size of the fish they think they will catch. Many reels, too small for the task, have been stripped clean of line by oversized quarry.

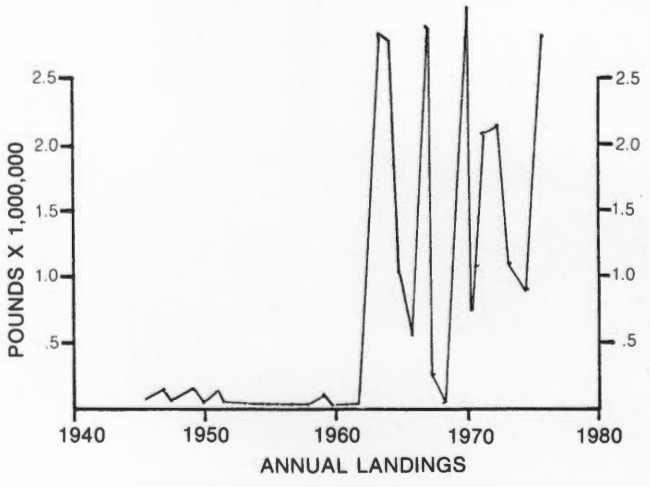
There are two principal methods used to catch tuna, trolling and chumming. Trolling is particularly effective on smaller, schooling tuna weighing 10 to 50 pounds, although much larger fish can also be taken. The objective of trolling is to move at a high speed and leave a large wake of frothy "white water." It is generally believed that the turbulence and bubbles attract tuna to the boat. Vary the speed of your boat until a successful range is reached. Lures—spoons, feathers, cedar plugs, plastic squids—and skip baits—balao, eel, mullet, squid and bonito—should be trolled on relatively short lines, two to three wake waves behind the boat and just below the surface. Cedar plugs and feathers should pop out of the water on occasion; spoons, however, should be held beneath the surface with trolling weights. Teasers are also effective in creating turbulence and attracting tuna.

Although tuna usually frequent waters more than 100 feet deep, they are occasionally taken a few miles offshore. Since they travel in schools, considerable effort should be expended searching an area after an initial fish has been hooked. Tuna prefer warm water and are ususally caught off New Jersey between late June and October.

Chumming is done from an anchored or drifting boat. A slurry of ground bunker and sea water is ladled overboard to produce a continuous slick. Small pieces of chopped herring or bunker can be added sparingly to spice up the slick. Set several baits at various depths in the slick. Best baits are live or very fresh whole bunker, butterfish, squid, ling, or mackerel. Use a single, large short-shank tuna hook on a monofilament leader. Allow the fish plenty of time to swallow the bait before setting the hook. The most productive tuna chumming in our area usually occurs in September or October in the Mud Hole. If you are lucky enough to have a 1000-pound monster set his sights on your boat, you'd better have a 16/0 reel and plenty of stamina.

ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graph), Bigelow and Schroeder (1953), McHugh (1977).



SUMMER FLOUNDER

BIOLOGY

Common names: ***summer flounder, fluke, flounder, plaicefish***
Scientific name: ***Paralichthys dentatus***
Range: Maine to South Carolina
Size: Fluke average between 2 and 5 pounds. Length/weight relationship: 15" to 16" = 1 pound, 20" = 3 to 4 pounds, 30" = 10 pounds.
Food: Primarily fish, squid, shrimp and crabs.
Migration: Fluke summer in bays and inshore ocean waters. They migrate offshore in the fall and winter Cape Cod to North Carolinia in waters 20 to 85 fathoms. In the springs, fluke return inshore to approximately the same area as the preceding summer or a little more northward and eastward.
Habitat: Fluke prefer sandy and muddy bottoms and are sometimes found partially buried.
Spawning: The female fluke deposits her eggs in the fall and winter months as the fish are migrating to deeper offshore waters. Fluke eggs are pelagic, meaning they drift anywhere in the water column. Eggs hatch in 73 to 75 hours.

When in the larval phase, summer flounder are bilaterally symmetrical, meaning they have an eye on both sides of their skull and swim upright. When the organism reaches an approximate length of 9.6 mm the right eye begins migrating to the left side of the skull. Although the summer flounder is frequently found on the bottom, it is a swift swimmer and has been known to pursue schools of small fish to the surface.

RECREATIONAL AND COMMERCIAL IMPORTANCE

The fluke is one of New Jersey's top gamefishes. So much fishing pressure is exerted on the fluke that anglers in the bays and along the ocean shore land more pounds of this flatfish than the commercial fleet. In 1979, for example, a saltwater sportfishing survey estimated that New Jersey anglers caught 5.1 million fluke, more than any other single species. The catch is not always this great, however, for fluke, like most other saltwater species, undergo natural cyclical variations of abundance.

Because of its fine eating qualities and consequent high market value, fluke is one of the state's most important commercial foodfishes. During the past 40 years, landings have fluctuated with changes in abundance; maximum landings have exceeded 8 million pounds. Fluke are taken in otter trawls throughout the year, but catches are greatest in the early fall as the fish migrate from coastal bays to their spawning grounds at the edge of the continental shelf.

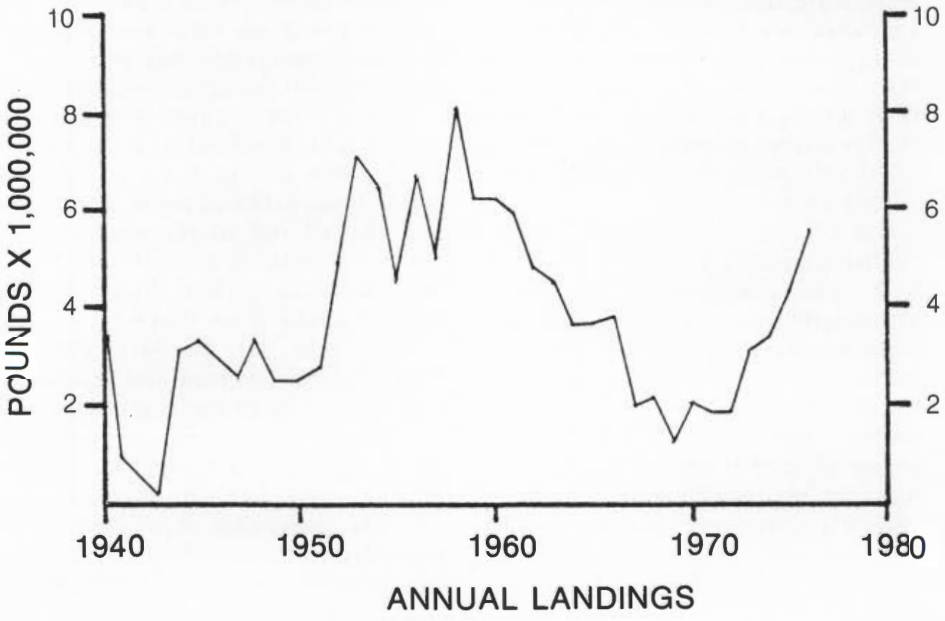
Continued on page 28

SPORTFISHING FACTS AND TECHNIQUES

The fluke is one of New Jersey's most cooperative game fishes, providing action for all types of fishermen—bank, surf, private boat, party, and charter. Fluke are available in bays or nearshore ocean waters during May to October. Since fluke are primarily bottom feeders all flounder rigs are designed to rest or drift on the bottom. One of the most simple fluke rigs is a single hook tied to a three-foot leader attached to a sinker; other popular rigs include top and bottom and bucktail with or without a trailer hook. Being a voracious species, the fluke prefers a moving bait and the most successful fishermen let their boat drift with tide or, when fishing from the bank, cast up and across the current. The object of either method is to let the sinker drag along the bottom and keep the bait in constant motion. Some anglers prefer to troll slowly with their baits dragging over the bottom. Another effective but seldom used technique is to chum over shoal water during an incoming tide. Fluke will take almost any bait, including killies, spearing, sand eels, snappers, spot and other small fish, as well as strips of squid, fluke, mackerel, and shark. Some of the best locations for fluke are along the edges of channels and sandbars, in ocean inlets, and in nearshore waters with uneven bottoms.

ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graph), Hildebrand and Schroeder (1972), Bigelow and Schroeder (1953), Lux, Hamer and Poole (19), Simons (1976), McHugh (1977), Breder (1948).



What Do Ecologists Do?

BY MARY ANN FOOTE

ILLUSTRATIONS BY TONY HILLMAN

It started out, innocently enough, with a mimeographed letter urging me to volunteer for the 21st Annual Hutcheson Memorial Forest sampling program. Perhaps "volunteer" is not quite applicable, for we were offered a modest salary. After a fleeting moment of consideration, I decided to sign up for Monday and Wednesday. The promise of money is always enticing to a graduate student; more importantly, I thought, would be the experience, the camaraderie, the communing with nature. I was a bit concerned about the early starting time of 8 AM but realized that two days of early rising could be tolerated, especially with a day off in between them.

Later, I ran into the faculty advisor for the sampling. He seemed very eager to have me join the team and quickly assured me that I need not know anything about plants to do this. I thought he was a bit too fast with his assurance to tolerate my ignorance of things terrestrial. After all, I work with microscopic algae, not weeds. Furthermore, most of my associates tease me incessantly about my loathing of field work, knowing that I prefer the safety of my lab to any of their adventures.

A few days later, I received another mimeographed letter thanking me for volunteering. I was assigned to work Monday and Tuesday and—oops, sorry, said the letter—we would start at 7 AM to avoid the heat of the day.

Saturday, I made a gallon of limeade and froze it to guarantee myself a cold drink in the field. I made a list of essentials: sunblock, little packaged towelets, rubberbands, lunch, hat. My mother asked me what I'd be doing. Counting trees, I told her. You know, the things terrestrial ecologists do.

Monday morning the alarm sounded at 4:30 AM. Fortified with determination to play ecologist, I crawled from bed to bath, gathered my acoutrements and slipped out of the silent house. There was nothing on the radio at 5:30 AM, but a gas line had already formed on the Garden State Parkway.

At 7 AM, Dr. P., Mrs. Buell (a grandmotherly woman and veteran of this survey—with more expertise and energy then any of us), Ellen, Sandy, Doug, Ken, and I nodded knowingly, albeit sleepily, to each other, gathered up our surveying equipment, and headed into the woods. I checked the rubberbands around my pants legs and sprayed them once more as protection from the dreaded ticks. At last, I was to discover what ecologists do. The William L. Hutcheson Memorial Forest, located about nine miles west of Rutgers University near East Millstone, consists of 155 areas of fields of various ages and a 65-are primeval uncut forest. We were to survey a series of small fields whih had been set aside during the past 21 years, allowing study of sucessional sequences. The object of our work was to find 2-inch wooden stakes, scratched with indecipherable codes, under 6-foot-high weeds. Plastic Ribbons were tied to the stakes and often festooned nearby trees to aid in discovering the elusive markers. Once the proper marker was found, one 2-meter stick would be laid from west to east, a half-meter stick placed at each end, and another 2-meter stick added to complete the square-meter quadrant. Then the work would begin. Mrs. Buell showed us that our clenched fist equaled approximately one percent of the area of the quadrant. Using this crude measure, we were to determine each plant species comprised in the area, beginning with trees and shrubs and ending with mosses and lichens. Dr. P. and I became a team. Good, I thought; he's an ecologist and since I only know Queen Anne's Lace, I'll just have to record what he says. We found our first quad quite easily, laid out the markers, and began. Dr. P. decided on 100% overhang for the multiflora rose. I panicked. I inquired as to the scientific name, please. Dr. P. looked at me squint-eyed; it was *Rosa multiflora.* Surely, he would rue the day he informed me I need not know anything to do this.

At 7 AM the dew has not yet dried. Within a matter of minutes, we were drenched, especially from the knees down. Our first quad finished, I learned the scientific binomial for poison ivy—*Rhus radicans*—and I also learned that I was ankle-deep in the stuff and that the 15-foot vine next to me, gently brushing the back of my neck, was *Rhus radicans.*

The morning wore on; Ken mentioned that it was nice to be in the field again after so many weeks in the lab. I looked at him squint-eyed. The sun was getting hotter with no breeze to be felt. We'll probably quit soon for lunch, I thought, my 5 AM breakfast long gone. The heat of the day, which we

You're standing in *Rhus radicans* (Poison Ivy)!

were to avoid via our 7 AM starting time, would soon be upon us.

We trudged deeper into the forest. It was 11:30 and the heat of the day was definitely with us. My cotton coveralls, once wet with dew, had dried and were conforming to my legs like thick tights, making it impossible to move from standing to squatting to standing position again, movements needed to adquately examine the plants. I hoped all this goosestepping through the brambles was good for trimming my thighs. We laid down our umpteenth quadrant and in the process of finding the east-west markers. I trompled all the vegetation within it.

About 12:30, we stopped for lunch, plodding back to the cool of the caretaker's basement. I removed my wet sneakers and from my socks two dozen sticky fruits hitching a ride, hopefully, to a new territory. I threw them into the garbage and guiltily thought that this action might change the course of evolution

My limeade was still frozen in a block too large to fit through the opening of the plastic milk jug but it didn't matter as I was too intrigued by Doug munching on a raw kohlrabi. We discussed the question "How many digits does your husband have?" from the *Newlywed Game* and what to do with 40 unwanted baseball-bat-sized zucchinis.

Soon we were out in the woods again, out in the heat of the day. By 2 PM, all plants looked identical and the blackberries had started mobilizing, reaching out with prickly arms to entwine me. I became more relaxed with my lack of terrestrial ecology because every so often, Dr. P. would look at his card scribbled with notes trying to distinguish the different species of goldenrod. I was tempted to tell him the joke about the sea captain, the locker, and the important document kept there which simply said, "Port, left; starboard, right." A tick tried to climb inside my shirt and after a short frantic skirmish, I won and Ellen urged me to puncture it.

About 5 PM, Mrs. Buell decided I had had enough. We hadn't finished the 48 quadrants of the field and I bravely opted to continue. Sandy complained that we had worked the entire day, avoiding only sunrise, sunset, and possibly moonrise.

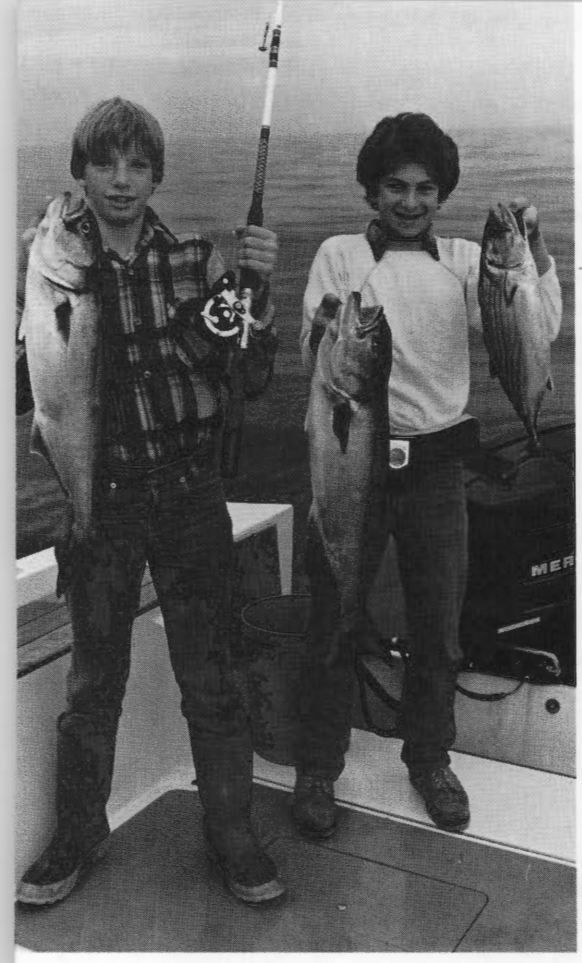
I was so exhausted, I drove home with my left eye closed. When I stopped at a toll booth, my jug of limeade, finally defrosted, spilled over the car's white upholstery.

Tuesday at 4:30 AM the alarm went off; dutifully, but less determinedly, I arose and wandered about. This time I packed two cans of Coke with my lunch and brought a scarf to twist around my neck as a deterrent to ticks. I listened to a religious program on radio as I cruised down the highway. The announcer praised the Lord for another beautiful day and noted that the temperature was 76, the humidity 83. I switched to a disco station.

Seven AM found us in the field finishing the 10 quadrants remaining from Monday. Moving quickly along, we did another field of 48 quads before lunch. All morning, however, Mrs. Buell had picked blackberries to feed me, still convinced that I was soon to expire. Another breathless afternoon in yet another abandoned field followed another lunchtime discussion of the *Newlywed Game.* Ken complained that every time he moved, his sweat-soaked jeans ripped the hair from his legs. I was so weak from dehydration that laughing, I fell into a poison ivy patch. We began calling *Parthenocissus,* parapluies (French for "umbrella") and *Solidago canadensis,* cannabis. Ken read off an entire quadrant while I sat gazing into space, recording nothing. I'm lost, I complained; I don't know where I am. Ken asked to come along. Cedar needles dropped down my back making me itchy and petulant while caterpillars camouflaged as cedar needles clambered up my arms. We crawled through a forest of 4-foot high sumacs searching for the red plastic ribbons amongst the red sumac leaves. There were no blackberries to ease me through the afternoon. I declared that I was going to remove all my clothing if we didn't finish soon; Mrs. Buell raised an eyebrow and suggested that I drink more water so I wouldn't suffer so much from the heat.

Finally, we completed the last quadrant and as we walked back to the caretaker's house, Ken confessed he was thinking of only two things—a beer and swim. I said sex and pizza immediately came to mind, quickly apologizing for my brashness, citing the heat as the factor.

In November, we returned to Hutcheson Memorial Forest and stood amongst the sentinals of dead *Solidago* stalks. The wind whipped about us swirling crisp leaves into little eddies as we shouted out the names of the plants we had known in July. Only their dried ghosts rustled a reply. We recalled the heat and the ticks of summer as we stamped our feet on the hard bare ground. We spoke of the dark green leaf which we had found and its row upon row of pearly egg cases and we laughed at how we had eaten handfuls of plump blackberries warm from the bush. And I thought, as we hurried off, if I had not learned what ecologists do, at least I have experienced the camaraderie, the communing with nature, and had earned many good memories. □



Diamond jigging is easy—even youngsters can do it with little practice. Conventional tackle is preferred for fish such as bluefish and bonito.

Diamond Jigs...

an old-time lure rediscovered

BY PETE BARRETT

Thousands of anglers are singing the praise of the diamond jig, one of the oldest of fishing lures, now modified and perfected into a modern, super fish-catching lure. Party-boat and small-boat fishermen have been tallying up impressive catches of striped bass, bluefish, weakfish, bonito, and false albacore, while tuna, cod, and pollock are known to be dazzled right into the fish box by the glitter of the diamond jigs.

In their most primitive form diamond jigs go back at least 100 years. Commercial fishermen used them on tarred hand-lines to catch large quantities of fish for the marketplace. You know the lures had to be good before a man would stake his livelihood and the well-being of his family on them.

Diamond jigs served sports fishermen equally well for decades and saw extensive use on the old sail- and steam-powered party boats of New York ports. They were still mostly used on hand lines but their reputation as a good fish-catching lure is well documented.

Sometime during the 1960s several party-boat skippers in the Sandy Hook area began developing a new method of fishing that used the diamond jig in a way that soon became famous all along the coast. Led by Captain Whitey Morenz on the *Miss Take II,* these captains used a fast retrieve of the jigs known as "speed squidding." The method caught fish, especially bluefish and striped bass.

If there is a secret to the lure's success it lies in the pure simplicity of its design. The long, slender lures reflect light from four or more slab sides that resemble the facets of a diamond—hence the name diamond jig. They are molded of lead to send them plummeting quickly to the bottom and are plated with durable chrome to provide plenty of flash as they speed through the water.

The most basic version of the lure has a silvered finish, and uses a barrel swivel to connect the single hook to the lure. The swivel prevents any chance of a gamefish applying leverage against the hook and throwing the lure. In this basic form the lure simulates a wide variety of baitfish, one of the major reasons for its success. It is nearly a dead ringer for the sandeel, a baitfish that has experienced a dramatic population explosion in the last few years. The long diamond jigs have exactly the same profile and glitter as the sandeel.

Diamond jigs have little action of their own but must be manipulated by the angler to breathe life into them. They perform best when jigged off the bottom in deep water, but can also catch when there are schools of fish breaking water feeding on the surface. They can be cast into chum slicks and retrieved rapidly up the slick, a method that works especially well on bluefish and members of the tuna family.

They come in many sizes but the most favored are the 3, 4, and 6-ounce weights. Cod fishermen may go as heavy as 16 ounces while mackerel fishermen use tiny half- or one-ounce jigs, but the commonest sizes are the mid-range weights. When fishing the jigs you only need enough weight to reach the bottom quickly without using too heavy a jig. A 3-ounce would be perfect for 40 to 80 feet of water. Likewise the 6-ounce jig would work well in waters of 40 to 60 feet at offshore ridges or in the very shallow waters close to the beaches.

Diamond jigging has created specialized tackle to get the best action from the lures and to fish them more easily. Most fishermen prefer conventional reels like the Daiwa 30H or 60H because of the very fast retrieve ratio of nearly 5 to 1. Conventional reels offer greater sensitivity and more control of the lure as it drops to the bottom, and have more power to put the boots to very big fish hooked in deep water.

Spinning reels are the second choice and again reels with high-speed gear ratios are logical choices.

Rods should be beefy in the butt section to provide power and leverage to move fish from deep water. They should be matched to the pound test of the line and the weight of the lure used. The butt should be strong enough to pull the plug out of the bottom of the ocean yet the tip sensitive enough to transmit even the slightest pick-up of a dainty weakfish.

Lighter lines are an advantage when jigging. The smaller diameter of 12-, 15- or 17-pound test line has little resistance in the water and places only a small amount of drag on the lure as it drops to the bottom. Heavier lines don't allow the lure to settle so quickly, but either strong currents or very big fish may require that lines stronger than 20 pound be used.

Diamond jigging requires little in the way of fancy knot-tying or leaders. Unless you meet a lot of toothy critters, wire leaders are seldom

used. Even bluefish, justly famous for their dentures and their ability to cut a line in the wink of an eye, rarely hit the jig up high, and there is a six-inch margin of safety between the hook and the forward eye of the jig.

I have experienced problems with a second fish trying to steal the bait (actually the lure) from the mouth of the hooked fish. Times like this, when you can lose jig after jig, call for a short length of wire leader. Use either plastic-coated braided or single-strand wire about 6 to 10 inches long.

I like to rig a long monofilament leader at the end of the main fishing line. One fall afternoon fishing off New Jersey's Manasquan Ridge we often had three or four fish on at a time. At times like this you can simply grab the leader and swing the fish aboard. Tie a bimini twist in the 17-pound main fishing line, then join a 10-foot length of 30-pound leader to this double line with a surgeon's knot. Of course large fish will have to be gaffed, but for fish of less than 15 pounds, a stout rod will handle the burden nicely.

Diamond jigs work best when gamefish are schooled thickly over some type of bottom structure in deep water. A graph recorder is essential for pinpointing the fish, and the structure, for consistent catches. After running a timed compass course to a known structure, the graph recorder is switched on and carefully watched. Once the structure is located, the graph will quickly show the depth of the fish and you can also figure the way to drift. For instance, there are times when the fish will mark on one side of reef or ridge facing into the tide, while 6 hours later they will switch to the opposite side after the tide changes.

Some structures are small and you have to keep your senses finely tuned to stay on the fish. Keep a weather eye open to the wind and tide and the direction of the drift.

Some of the more famous fishing structures such as the Manasquan Ridge, McCrie Shoals off south Jersey, Fenwick Shoals off Delaware, and Great Eastern off Montauk, are well known. On most days these areas will attract large fleets of party, charter, and private fishing boats, making it relatively easy to find the fish.

Most fishermen will drift over the structure, dropping the lures to the bottom and retrieving at a fast speed hoping to fool the fish. After drifting past the structure, the engine is fired up and the boat run back over the area until just beyond the start of the structure. You can drift over the same stretch of bottom ground many times, getting the lure in front of hundreds and sometimes thousands of fish.

Anchoring is usually *verboten,* not only because it limits the number of fish to see the lure but also because your craft will undoubtedly be in everyone else's way as they try to drift past you—or into you. If you are alone, however, and no one else is working over the same structure, anchoring can then pay off handsomely.

There are several styles of retrieve that work, but the basic action is best day after day for consistent catches. First place the reel in free spool. With slight thumb pressure to prevent the line from backlashing, drop the lure to the bottom. At the instant it hits bottom signaled by a thump or bump transmitted through the rod, flip the reel in gear and crank the handle like mad for 10 or 15 turns. Then free-spool the reel, dropping the lure back down, flip into gear, and retrieve. This drop-and-reel, drop-down-and-reel is repeated over and over until a fish strikes the lure.

There is absolutely no doubt when the fish hit. There are no nibbles in diamond jigging, just solid hits as the fish smack the lure for all it's worth. From that point on it's hang on! Most fishermen are surprised at the amazing power a fish can exert from such depths. It is not unusual to see a big, strong guy nearly brought to his knees in a struggle with a bluefish nearly the 20-pound mark!

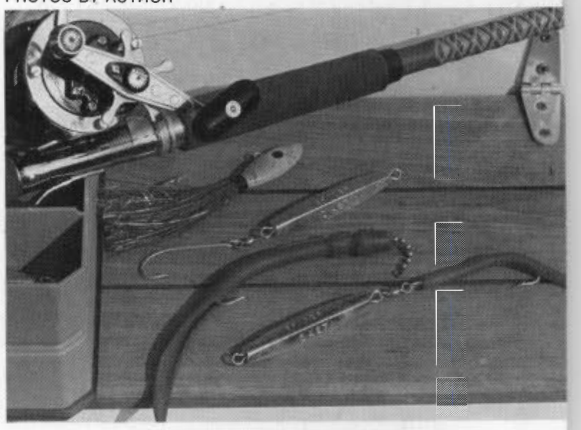
Beyond the basic retrieve there are several variations that work under changing situations. When the fish are marked by the recorder at the mid-depth range or are scattered randomly from top to bottom, retrieve the lure all the way to the rod tip before free-spooling it back to the bottom. When the fish are holding high near the surface, the jig can be cast out and away from the boat and again retrieved quickly in the very top layer of water.

Some fishermen do well with diamond jigs when broadcasting a chum slick to attract the fish in a steady school. The jig can be dropped to the bottom and worked in the basic manner, or cast into the slick and retrieved in jerks and sweeps of the rod tip to give the lure a dancing action.

Despite the fact that diamond jigs have undergone changes and new designs have been perfected, old-timers would still recognize their favorite lure. New models have molded-in fish scales, tapered bodies, keels, slight body bends for a wiggling action, and one has the look of a bent pencil, but they all are close copies of the original jigs used a century ago.

Other variations are not so close to the original lure. Instead of being chrome plated, some are slipped inside a length of surgical tubing and have another tube covering the hook shank. Nicknamed "banana splits," these lures are very popular. Other jigs sports only the surgical-tube tail, which adds to the profile appearance of the lure in the water.

PHOTOS BY AUTHOR



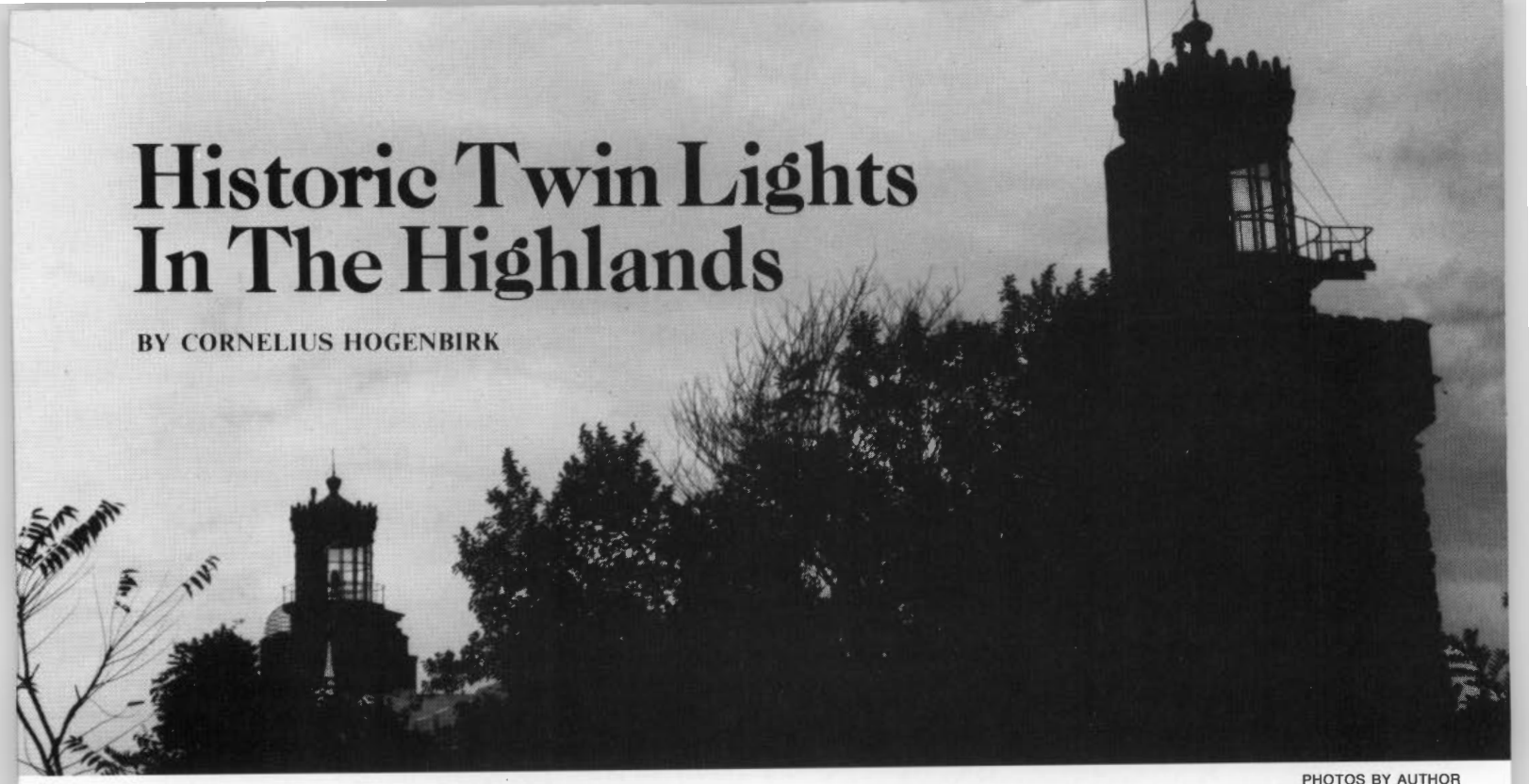
Diamond jigging is simply a variation of deep jigging, and the method works well with not only diamond jigs but also with surgical-tube banana lures and large bucktails.

Close relatives of the diamond jig, such as bucktails and the weighted surgical tube lures called bananas, also prove to be effective when fished the same as the diamonds.

While it's true that diamonds may be a girl's best friend, there's no doubt about the appeal diamonds (jigs—that is) have for fish. These old-time modern lures have taken the coast by storm and are providing fishermen with an exciting new approach to fishing that offers not only good catches of fish but a sporting and fun way to do it. □

Historic Twin Lights In The Highlands

BY CORNELIUS HOGENBIRK



PHOTOS BY AUTHOR

Even though I'm a native-born New Jerseyan there are many close-by scenic and historic sites that I've never taken the time to visit. One such site, recently visited, is the historic Twin Lights located in the Highlands, an area barely 40 miles from my present home in Union.

The first time that I visited the historic Twin Lights, I overheard a conversation between two men who were standing by a plaque commemorating the site of the original Marconi Tower. Said one of the men to his companion, "So this is where it all started." The other reflected, "Yeah, this is the spot. It all started right here."

I am sure that what was in their minds was the rapid progression starting with Marconi's first wireless telegraph, on to radio, then on to TV, and even on to the magic of today's tiny space vehicle, Voyager I, 947 million miles and three years away from Mother Earth, transmitting amazing radio photographs of the planet Saturn, its rings and moons.

In its own day, what the Marconi apparatus was able to accomplish was difficult for the citizen of those times to understand. The words inscribed on the Marconi tower plaque tell the story:

Here in 1899 Guglielmo Marconi erected the antenna mast of the first wireless telegraph installation in the United States capable of sending and receiving messages on a regular commercial basis.

It was first used on September 30, 1899 to receive reports from the steamship Ponce *on the progress of the naval review saluting the triumphant return from the Phillipines of Commodore George Dewey, the victor of Manila Bay on October 3, 1899. The same wireless apparatus was used to receive reports on the America's Cup races between the* Shamrock *and the* Columbia.

With modifications a Marconi wireless station remained at this location for communications with ships at sea until 1907, when it was dismantled and replaced by a new station at Seagate, New York.

"Yeah, this is the spot. It all started right here." A tiny spot in the state of New Jersey, on a bluff overlooking the Atlantic Ocean and Sandy Hook, with the harbor of New York just to the north.

Inside the Twin Lights museum itself are exhibits that include replicas of the old-time radio equipment used by Marconi. There are old, yellowing seafaring photographs and examples of life-saving boats and equipment.

In a separate building a high rotating fresnel lens, the kind used in lighthouses, demonstrates the light-transmitting powers of this type of lens.

Once again, inside the museum itself, visitors are permitted to go to the top of one of the towers. The circular stairway is steep and narrow, but not too difficult to negotiate. If you're not in shape or are a little queasy about heights, then forget it, there is no elevator. Once at the top, the view on a clear day is spectacular. There are steel guard grids encircling the top for your safety. If you elect not to go up, then enjoy the view from the lookout points on the grounds itself; The sights are still worth seeing. Be sure to bring along your binoculars.

To research the Twin Lights from the northeastern section of the state, take the Garden State Parkway south to Exit 117 (not 117A); exit onto Route 36, then on through Atlantic Highlands and into the Highlands. Just before you reach the bridge that crosses the Shrewsbury River to Sandy Hook and Sea Bright, on the right, you'll see a Twin Lights signpost. Turn right here, and immediately thereafter bear right again on the street to Twin Lights, following the signs. The final drive is a bit narrow and quite steep. Parking is free; rest rooms are available in the museum, and on the grounds there are a few tables and benches where you can

Historic Twin Lights. Highlands, N.J.. A New Jersey State Park.

Local H.S. Soccor Team members at the Top of one of the Towers; "Getting a Better Look"

Views from the Twin Lights; Atlantic Highlands and Sandy Hook.

Spermaceti Cove Visitor's Center at Sandy Hook

enjoy your sandwiches and thermos.

Instead of going directly to the Twin Lights, I'd suggest a detour via the "Scenic Drive" in the Highlands. When you reach the traffic light at Atlantic Highlands keep to the right and then cross the highway via a jughandle, and again follow the signs. You'll reach a lookout point with ample parking near the end of the drive. Continuing on, you will come back onto Route 36, where a traffic light will permit you to cross and continue on east to the Twin Lights.

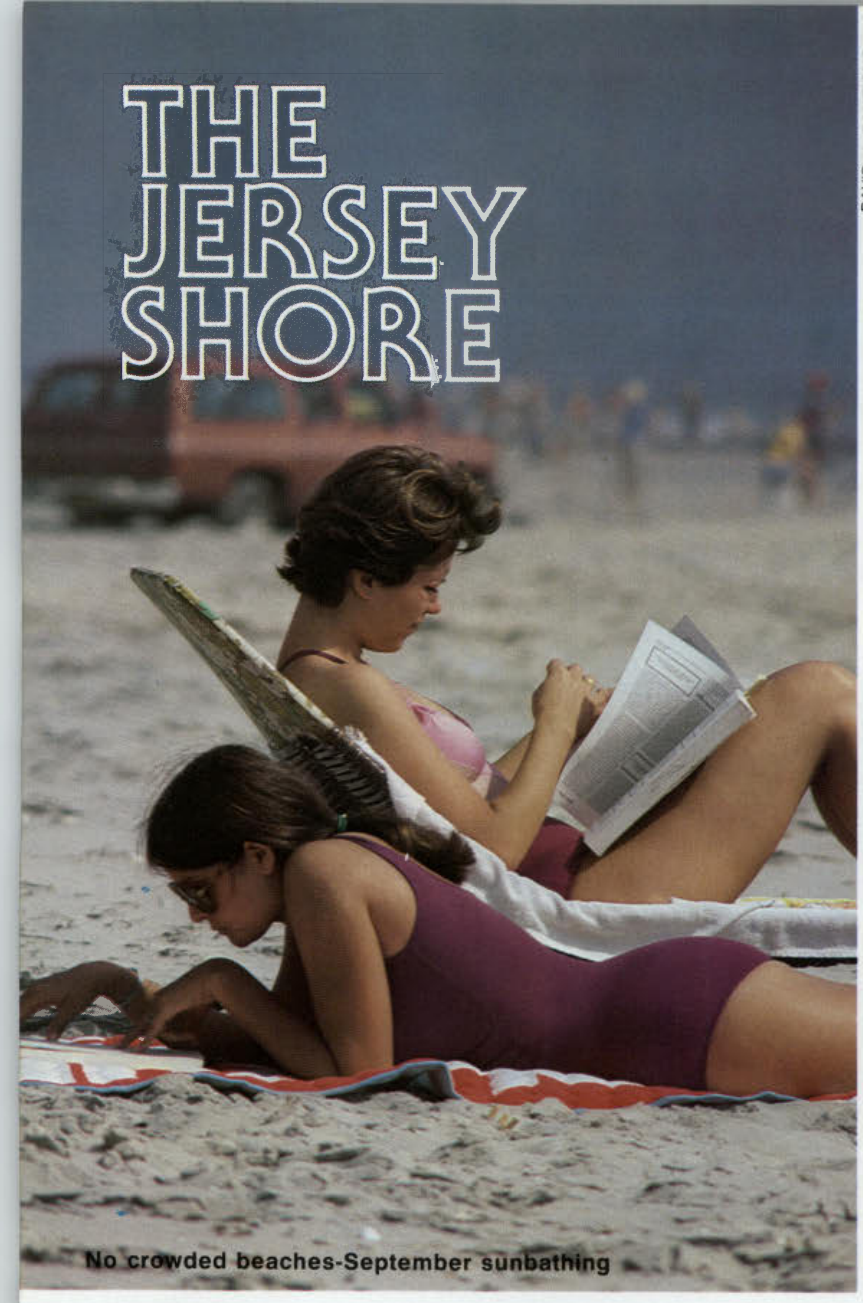
For a full day of sightseeing, visit the Sandy Hook Gateway National Recreation Area. You may, if you wish, go on a self-guided tour of Fort Hancock after obtaining a permit at the Spermaceti Cove Visitors' Center. A variety of guided nature walks also begin at the Visitors' Center. Or, if you wish, just spend the rest of the day walking one of the several beach areas, picking up shells, driftwood, beach glass, and enjoying one of New Jersey's most scienic areas.

Further information on the Twin Lights may be obtained from:

Twin Lights
c/o Cheesequake State Park
Matawan, New Jersey 07747

Mr. Howard Hayden is the Twin Lights museum superintendent; phone (201) 566-2161. □

THE JERSEY SHORE



No crowded beaches-September sunbathing

DAVID M. CAMPIONE

Dunes at Strathmere

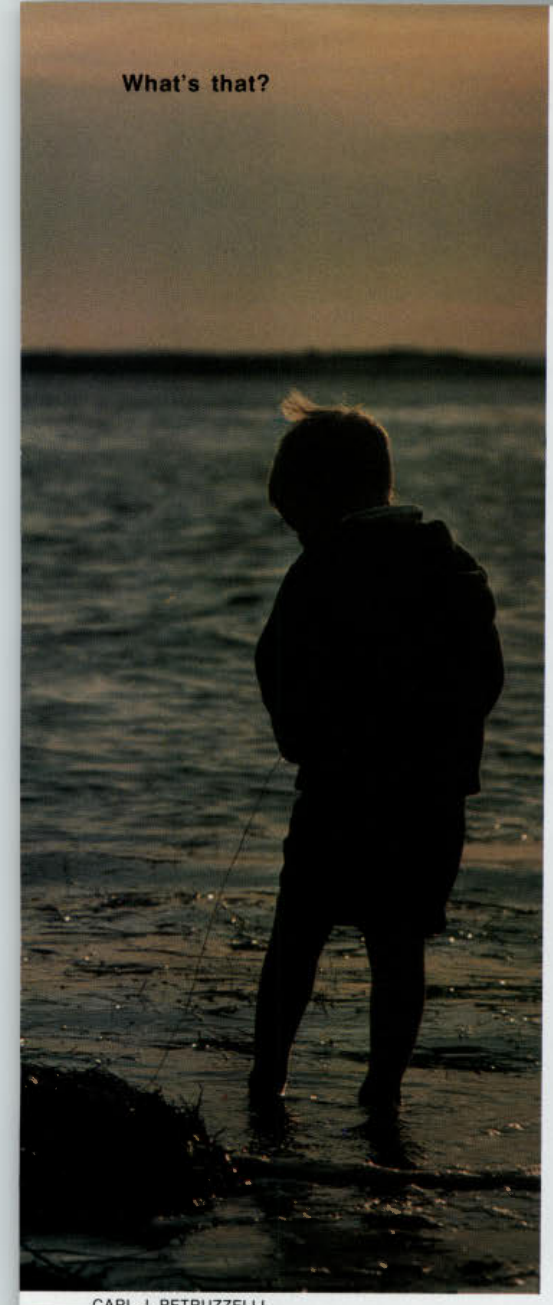
MICHAEL CHRISTOPHER

Long Beach Island

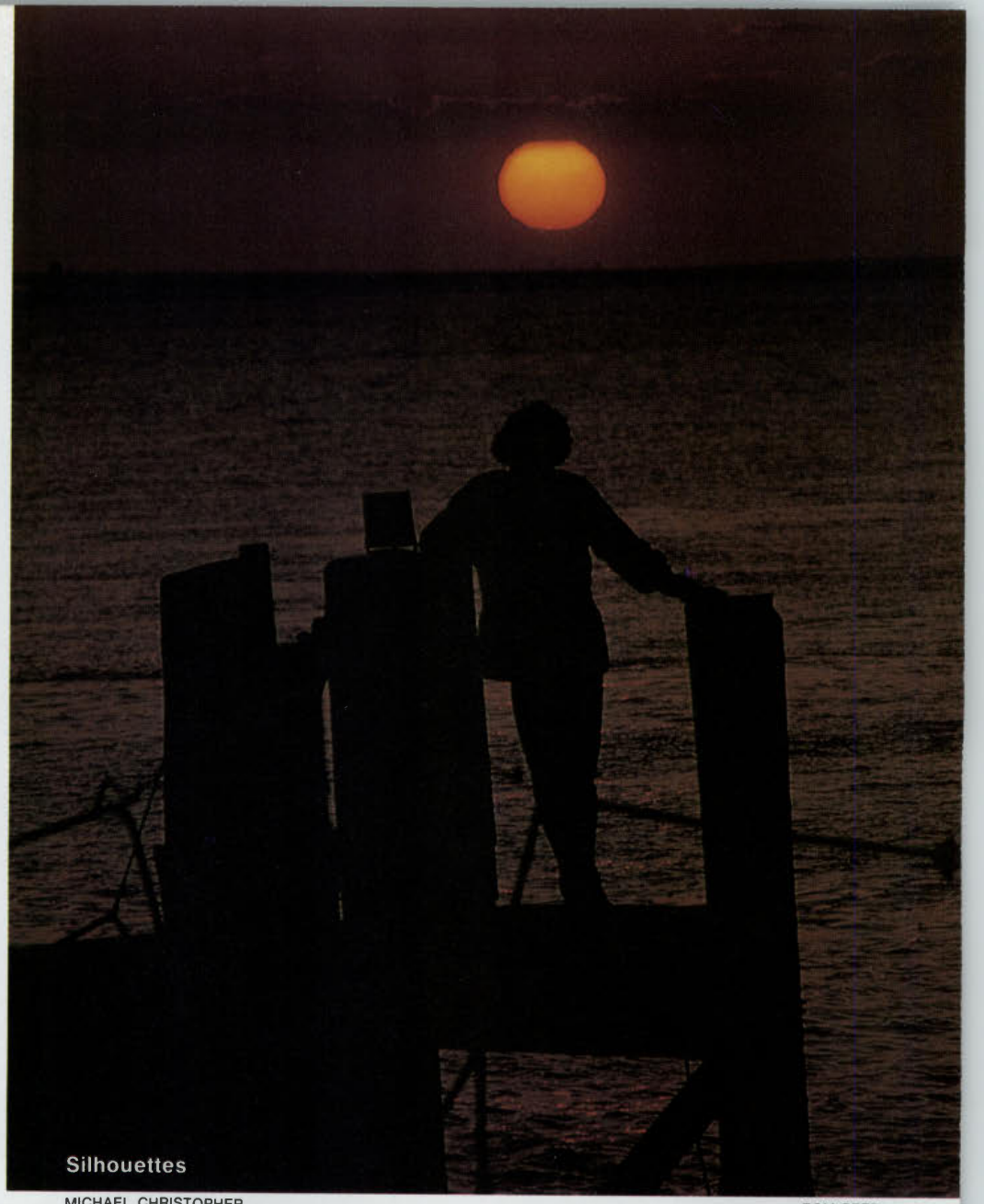
CARL J. PETRUZZELLI

DAVID M. CAMPIONE

Bidwell Creek inlet to Delaware Bay



CARL J. PETRUZZELLI



MICHAEL CHRISTOPHER

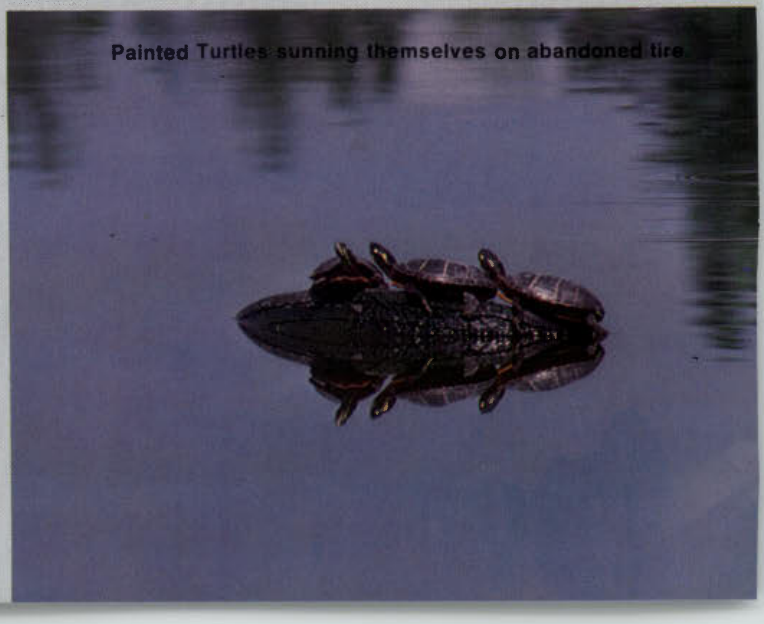
TOM REED

The Lower Passaic | Polluted But Still Alive

"Looking Up Stream" author's canoe standing idle while he explores.

Common Egret takes wing over the garbage-strewn shallows

"Prefab housing"—Canada Goose nesting on discarded tire.



Painted Turtles sunning themselves on abandoned tire

BY P.J. EMAUS

PHOTOS BY AUTHOR

The dubious honor of being one of the most polluted rivers in America is bestowed upon the lower Passaic River. This is quite a black mark on the state of New Jersey, one that with dedication and federal aid may someday be erased forever.

The Passaic River emerges from the Great Swamp area, then winds and twists slowly through 85 miles of the New Jersey landscape, completing its appointed journey into Newark Bay, then to the open sea.

The river above the town of Little Falls is fairly nice and partly secluded, owing to the lack of factories and to some undeveloped land. Below these falls is the lower river with its notoriously heavy pollution.

Clifton borders on the lower river, and since childhood I have resided in that city. Weekends and days off from school were spent in the mud of that river. At that age I overlooked the smell, the old tires, broken bottles, and other debris. The pollution was there nonetheless.

Carp were caught by hook and line, spear, or net. The frogs, turtles, and snakes I also caught became pets and were released at a later date. Exploring was a large part of the day and some "great treasures" were found amongst the debris and rubble. Muskrat houses served as lookout towers to spy on the invisible enemy of childhood war games. Ducks were chased but never caught, just pursued long enough to get oneself throughly wet and muddy.

I never really left the river, and now I return quite frequently, for many memories linger there. Time goes by very fast while on its banks or along its waters. Today I bowfish, photograph, and canoe my old haunts. I still explore the same areas year after year to keep track of any minute changes and often find unexpected treasures.

The stench of the river is still the same and the garbage still plentiful. The water is polluted as it was then, but—and this is a large *but*—the water seems to be cleaner now. Changes are quite evident as time progresses.

The wildlife inhabiting and frequently visiting the river has increased dramatically in the past four to five years. Ducks were always present during summer months, but as winter approached, the population declined markedly. More ducks winter over now till the spring mating and nesting season.

Canada Geese presently are a common sight throughout the entire year. Nesting seasons for the past five years have shown an increase in holdover geese. Five years ago I discovered only two nests, while this year eight pairs nested.

Summer transients that have been showing up in good numbers over the past years include the common Egret, which can be seen stalking the shallow waters in search of an easy meal. The abundance of minnows and small frogs has kept them returning to this area lately. You may also see the Great Blue Heron, flying majestically over the muddy waters. The Green Heron, quite a bit smaller than the others, prowls the same waters for food.

Gulls fly overhead screeching and cavorting, then alight to scavenge on fish carcasses. While looking over gull-eaten fish this year I came upon a half-eaten, eight-inch, smallmouth bass; apparently the carp are being infiltrated by some game fish.

They say that beauty is in the eye of the beholder. To see the real beauty of the Passaic River you must be able to look past a screen of garbage. If you can do this, the natural beauty of the river beomes quite apparent.

Wildlife abounds even under these less-than-ideal conditions. With cooperation from industry, private concerns, and perhaps the federal and state governments to help clean the garbage, the Passaic River may yet run clean. There is no telling the potential of this overlooked and underused natural resource. The Passaic is a New Jersey river. We cannot hide or avoid responsibility for it, as all 85 miles of it flows through our state. Let's try and help it flow cleaner. □

FISHING FASHIONS

A story by Eileen M. Van Kirk

It used to be that the elusive habitat of the striped bass or rainbow trout was a secret known only to the male of the human species. Their haunts represented a special place where a man could get away from it all—including wife, mother, sister or girlfriend. But no more. Women are now participating enthusiastically, if not always equally, in all sports, and more and more couples are hanging out the old "Gone Fishin'" sign and taking off to the lakes and streams together.

This may be a new experience for some women, so if you are newly wed, newly retired, or just new to the lure of rod and reel, here are a few suggestions that will make the game more enjoyable.

First of all, if your man invites you to spend the day with him on the lake in his new Jon Boat, this is not time to tell him you have nothing to wear. Nor should you rush out and buy a glamorous new outfit. You can't compete with the seductiveness of his fishing lures, or the exquisite perfection of a dry fly, so don't bother trying. Nevertheless what you wear can make the difference between an enjoyable day and sheer disaster.

A lake is a separate country. Its weather is as unpredictable as a woman in love. Sunshine, shadows, calms, and storms may sweep across its surface in swift succession, but a little planning can help you ride out all these changes with a minimum of discomfort.

Unless you are a true Nut Brown Maid, whose skin welcomes the sun, my advice is to cover up, but loosely. Slacks are better than shorts. No skin tight jeans, though—chose straight-legged cotton chinos, loose enough that they can easily be rolled up should you go wading into the shallows to retrieve a snagged fishhook. Above that, by all means a sleeveless knit top, but also bring along a long-sleeved shirt, preferably cotton (in cooler weather, bring a sweatshirt). Remember there are no beach umbrellas in the middle of a lake, and the sun reflecting on the water can burn even more than on shore. A lightweight straw hat with a shady brim is a help on sunny days, but watch out for capricious breezes. On very bright days sunglasses can save you hours of squinting against the sun's glare.

The question of suntan lotion and insect repellent is one that you will have to settle with your own fishing partner. There are some who feel that they repel the fish, but we have never found it so. However, we use both sparingly.

For shoes, any comfortable canvas shoes or sneakers with nonslip soles are fine. If you transport your boat, either on top of your car or on a trailer, you will probably be called upon to give a hand launching it. Lake shores are usually rocky, with many loose, sharp stones. Do not try to go barefoot, as it could result in a painful cut.

This outfit will see you comfortably through the hottest days, but what if there is a sudden change in the weather and a chill wind whips across the water, ruffling the surface and rocking the boat? In summer a nylon windbreaker, worn over the long-sleeved shirt, will keep you adequately warm, and it is easily packed and carried. You can get one with or without a hood. I recommend a hood as this will give added protection during a brief rainshower.

And speaking of rain, don't expect a little precipitation, even a howling gale or monsoon, to deter your partner. Not even the mailman displays the dedication of a fisherman on his self-appointed rounds. And what, you may ask, will save you from a ruined hairdo at least, or double pneumonia at most? The answer is a poncho. You can sit enveloped in a poncho and watch the rain pour off it like a mountain steam while you remain snug and dry. Again it is fairly easy to carry and simple to slip on in an emergency.

Emergencies arise at unexpected times. One afternoon my husband and I were trolling for bass out near the middle of the lake. It was a still, cloudy day. We drifted along at a gentle speed, our line trailing behind us making scarcely a ripple on the smooth surface of the water, when I heard a strange pattering sound.

"What's that noise?" I asked.

"What noise?" was the response. Fishermen tend to become oblivious to the world around them. By this time the patter patter was growing louder and closer.

"It sounds like rain," I said, "But it can't be." We were completely dry. I looked behind and saw, advancing towards us in a perfectly straight line like Pickett's charge, a squall that sent the water of the lake dancing at least half a foot into the air. We immediately dived into our ponchos, turned our electric motor to full speed, and tried to race it to shore. Storms travel faster than electric motors. We were overtaken and enveloped in solid sheets of driving rain. Without our ponchos we would have been soaked to the skin. However, it passed almost as quickly as it had come, and we were able to emerge like nymphs from our plastic chrysalis, bail out the boat, and stay and fish a little longer.

Being able to stay and fish a little longer is what it is all about. Once you begin to enjoy those long peaceful days when the only sounds are the faint chirping of the birds, the whirr of the spinning reel, and the gently plop, plop of the lure hitting the water; when you find yourself saying, "Just one more cast"; then you will no longer wear the habit of a novice, you will have become a full-fledged disciple. □

ILLUSTRATIONS BY ANTHONY HILLMAN

Environmental News

WATER CONSERVATION, HEAVY MAY RAINFALL BOOST WATER SUPPLY

Improving water conservation by the public and heavy rains during the first half of May brought a decision by Governor Brendan Byrne to put all northern New Jersey water rationing on "standby" and to scale down a nonessential use ban which impacts on nearly six million persons in 372 municipalities. *Conservation by the public and industry accounted for over 16 billion gallons of water saved which surpasses the total storage capacity of several of the state's major water systems.*

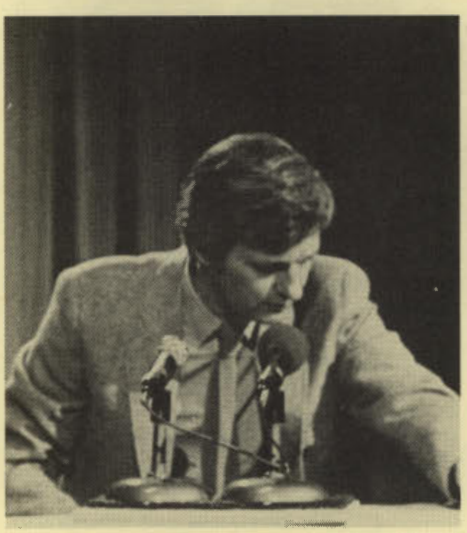
Paul Arbesman, the state's Drought Coordinator, signed the order for the new water rules (amending Executive Order 104) on May 19, a day after the steps were recommended at a Newark meeting by the Governor's Citizens' Advisory Task Force on the Water Management Emergency, and reviewed with Governor Byrne. Dr. Saul Fenster, president of New Jersey Institute of Technology, is chairman of the Citizens' Task Force.

Both Arbesman and Fenster stressed at that time that "whether we have to return to more stringent levels of conservation during the summer and fall will hinge primarily on the continuing public effort to save water." The Citizens' Task Force was scheduled to meet again June 1 to decide on any further changes to the water conservation program.*

The state's ability to deal with the drought was reinforced by the approaching completion of projects to upgrade treatment capacity at the Passaic Valley Water Commission facility and to improve bulk water transfer capabilities elsewhere.

Successful conservation plus heavy rains in May had raised the levels of reservoirs serving northeastern rationed areas to an average of over 93 percent full by the time the order was modified. This contrasts with the 21 percent of full experienced early in February.

*At the June 1 meeting the Citizens' Task Force recommended permitting sprinklers to be used on newly sodded lawns between 7 p.m. and 9 p.m.; and on golf course tees and greens between 9 p.m. and 11 p.m.



CINDY GORDON

'Hello. This is Alan Alda for the New Jersey Water Crisis Project.' Actor Alan Alda, a long-time resident of New Jersey, donated his time to record the short "save water" messages aired by radio and TV stations as public service announcements during the state's public awareness campaign to emphasize the continuing need to conserve water. New Jersey Bell Telephone Company donated the studio production time.

JORGI ROSKY

DEP employee Laurie Rosky, keeping dry under an umbrella during an April shower, is a visual accompaniment to the following excerpt from a "rainy day" spot taped by Alda to remind us that it DOES rain in a drought:

'. . . When it's raining the way it is now, you probably think you can start using water like water again. Well, the truth of the matter is you can't. Maybe 40 days and 40 nights of rain would solve our problems—but when was the last time that happened? . . . I'm not saying this to scare you, but I live in New Jersey, too, and running out of water scares me. That's why it's important that we all conserve just as much when it's raining as we do when the sun is shining . . . *Let's face it—We can live without a lot of things. Water isn't one of them.'*

"Standby" rationing means that water customers in 192 municipalities would no longer be required to adhere to rationing quotas of 50 gal/person/day, but that the water purveyors would have to maintain records and the necessary capability to return to enforcing rationing immeditely if it became necessary.

Under the amended nonessential use ban, water was not to be served in eating places unless requested by a patron, sprinklers were not to be used and there was no washing of sidewalks, streets or other paved areas permitted.

With the new order came liberalized uses of hand-held hoses, provided they were equipped with a shut-off nozzle. Approved uses included car washing and watering anything which was grown in a yard. Also, changes were made for golf courses and tennis courts. Both could be watered at will with a hand-held hose, while irrigation systems could be used on golf courses between 9 p.m. and 11 p.m. and a maximum of 10 minutes per day per court in the case of tennis courts.

This was the third switch to standby rationing since the number of rationed communities peaked at 192 with Governor Byrne's issuing of Executive Order 104 last February 7. Customers of Middlesex and Elizabethtown water companies, along with some other purveyors in the Raritan River Basin, went on standby in mid April. The same status went to most Commonwealth Water Company customers and those of a number of small systems using well supplies on May 7.

Emergency projects are continuing. These include the upgrading of filtration capability of the Passaic Valley Water Commission facility, so that its peak 75 million gallons per day (mgd) capability can be retained during periods of low flow in the Passaic River. Plant output fell to as little as 38 mgd earlier this year because of the high ration of treated

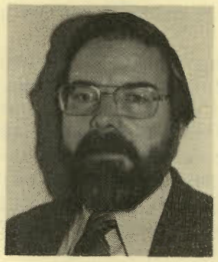
Continued on page 16E

Commissioner's Spotlight on . . .

Toxics in Groundwater

About 60 percent of the more than seven million people living in New Jersey depend on groundwater sources for drinking water—and in South Jersey, wells provide drinking water for 90 percent of population. (Other water sources, such as lakes, rivers and streams, are called "surface waters.")

More than three years ago, DEP's Office of Cancer and Toxic Substances Research Office undertook a pioneering, major groundwater testing project as one phase of a multiyear effort to identify, and, if possible, eliminate toxic substances which are contaminating the environment. The results of the first two years of this study, while showing that 95 percent of the wells tested met federal drinking water standards, at the same time indicated the vulnerability of New Jersey's groundwater systems to chemical pollution.



Robert K. Tucker, Ph.D., of the Office of Cancer and Toxic Substances Research and director of the study, in the article below summarizes the data given in the March 1981 Toxics in Groundwater report, "GROUNDWATER QUALITY IN NEW JERSEY—An investigation of Toxic Contaminants."

In 1975, Governor Byrne issued an executive order directing a concerted effort be made to find out the reasons for, and if possible to counteract, the high incidence of cancer in New Jersey. A primary task of DEP's Office of Cancer and Toxic Substances Research has been to determine environmental concentrations of chemicals suspected of leading to an increased risk of cancer in humans. As part of this effort—a unique statewide groundwater testing project—we now have an extensive data base on some chemicals occurring in groundwater aquifers of the state. The data base established by this study will be especially important in assessing future health effects of chemical contamination.

We looked for 50 chemicals, in three different groups—halogenated volatile organics (solvents), chlorinated pesticides and related compounds (pesticides) and metals. This report summarizes data from 1,118 samples taken from 670 wells. It also discusses sources and behavior of chemicals in groundwater and some of the implications for human health.

One or more of the eight solvents were found at concentrations above 10 parts per billion (ppb) in 16.6 percent of the wells tested. These eight chemicals include five—carbon tetrachloride, chloroform, dichloroethane, tetrachloroethylene, and trichloroethylene—for which evidence from animal tests establishes them as capable of causing cancer; and three others—trichloroethane, and the di- and tri-chlorobenzenes—chemically similar to known carcinogens, but for which there is no reliable evidence that they cause cancer. In 3.1 percent of the wells in our study, concentrations of one or more of these eight chemicals exceeded 100 ppb, a clearly unacceptable level.

Pesticides, when detected in this study, were usually at very low concentrations. Thirty-one wells had concentrations exceeding standards, but in most of these cases the excess was slight or not confirmed upon resampling. Three drinking water wells with unacceptable levels of these chemicals were removed from service. Because these chemicals are extremely persistent, because they tend to build up in fatty tissue and become concentrated in organisms including humans, and because most of them are known to cause cancer in animals, even low levels of chemicals in this group are cause for some concern.

With exceptions in a few specific instances, metals appear to present a less serious health problem than do the solvents in the state's groundwaters. During the first two years of this study, three potable wells and nine wells not used for drinking water were found to have confirmed metal contaminations. Lead, found over standard in 13 wells, was the most frequent serious problem, followed by chromium and cadmium. One case of extensive arsenic contamination of a well was discovered.

Movement of water through underground aquifers is generally quite slow, usually measured in feet per year. On the one hand, this means that individual cases of groundwater contamination will be localized and that there is time to deal with such cases in an orderly manner once they're discovered. On the other hand, such slow movement lessens the opportunity for the contaminant being flushed away and the problem solving itself. Moreover, because many contaminants tend to be retained by solid aquifer material (clay particles, for example), they tend to move even more slowly than the bulk flow of groundwater itself. However, lower molecular weight volatile organics (solvents) move more quickly and thus spread more easily from a source of contamination. The relative ease of movement, resistance to breakdown, widespread use, and potential cancer causing effects combine to make halogenated solvents the greatest threat to New Jersey's groundwaters.

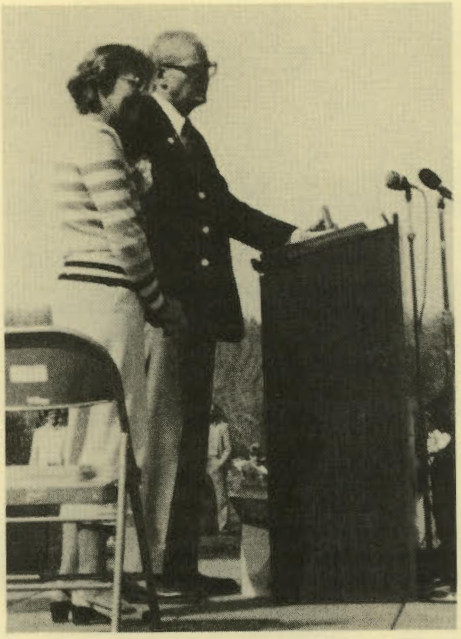
It is not possible at present to determine the actual degree of cancer risk to humans from ingestion of chemicals in drinking water. Estimates of risk have been made by extrapolating from animal data, but such estimates are subject to uncertain assumptions and statistical error. There is general agreement in the scientific community that compounds shown to cause cancer in animals present a cancer risk to people. It is also agreed that for such compounds there is no threshold level below which risk is absent.

Of the 670 wells included in this report, 31 were found contaminated to a serious degree. Of these polluted wells, 20 were used for industrial or monitoring purposes and 11 had been used for drinking water. The contaminated drinking wells have been removed from service. Although 95 percent of the wells tested in this study can be considered acceptable for potable use, this is no cause for complacency. Even though most wells in New Jersey are safe, the fact that 3.1 percent of them had volatile organic contamination above 100 ppb, that 16.6 percent showed such contamination greater than 10 ppb; that standards for metals were exceeded, if only temporarily, in 29 wells; and that 31 wells had at least transitory problems with low levels of pesticides serves to confirm the vulnerability of groundwater to contamination. It is imperative that everything possible be done to prevent or minimize entry of toxic chemicals into groundwater.

Requests for further information or copies of the March 1981 Toxics in Groundwater report should be directed to Thomas Burke, Director or Dr. Robert Tucker, DEP Office of Cancer and Toxic Substances Research, 190 West State Street, Trenton 08625. □

DEP 1980 ANNUAL REPORT AVAILABLE

The Annual Report of the New Jersey Department of Environmental Protection for fiscal year 1980 (July 1, 1979 through June 30, 1980) has been published. Please address requests to Pat Lane or Mary Ann Delorme, DEP Documents Distribution Center, CN 402, Trenton 08625.



LORETTA BRENNAN

Governor Byrne greets the crowd gathered for the Earth Day 1981 celebration at Washington Crossing State Park. Commissioner English (standing, left), in a verbal resume, touched on environmental achievements of the past, hopes for the future, and recent political actions that place money considerations ahead of the public health and welfare. (Text given below.)

EARTH DAY CELEBRATION
Commissioner's Remarks

"I have been writing my resume. I suddenly realized how short my time in public service has been—10 years soon—and how little time I have left. I used to think to change things, but more often nowadays I think about how not to have our progress of the past decade erode into the Camelot vision of a golden age not soon to be rivaled.

Recent political actions would lead one to believe that there is a certain herd mentality in the land and that everyone is willing to sacrifice the public's health—in our workplace, in our drinking water and in our urban national parks to a higher calling—falsely denominated budget frugality.

What kind of courses are being taught if an economist can really say that the way to stem inflation is to poison the water and foul the air? And, for some reason, there is a lull everywhere waiting for someone—me, you, all of us—to say, "You misjudge us and our mood! You misjudge the degree of civilization we think we are entitled to, willing to support and willing to enforce."

We are mindful that very powerful and efficient toes have been stepped on—charges of mad scientists, arrogant regulators, insensitive dullards—become commonplace rhetoric; UNTIL a water supply is threatened, or cancer-causing materials are found in backyard lots, or a fire of holocaust proportions develops and everyone wants SOMEONE competent, realistic and pragmatic to be in charge. We must send out the word that we are not practicing applied theology—but the best technology that we can muster for the occasion.

Continued on page 16H

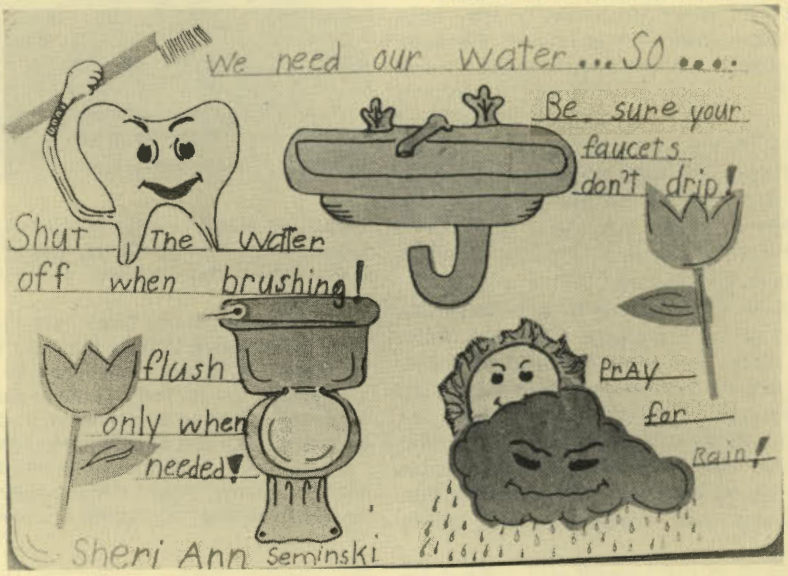
WE'LL BE IN THE EARTH'S CORNER—AND SHE CAN COUNT ON IT!

—Commissioner Jerry Fitzgerald English, April 22, 1981

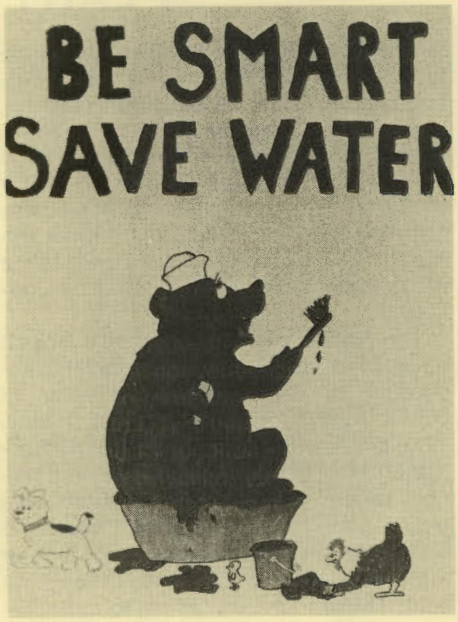
The celebration of Earth Day 1981, held at Washington Crossing State Park (Mercer County) on April 22, was highlighted by the presentation of awards to the winners of DEP's second annual poster and essay contest for students throughout New Jersey. The hundreds of entries on the theme, "Water Conservation," were thoughtful, imaginative and well-executed—the team of judges from public and private educational and environmental organizations had a difficult time choosing the winners. One thing was proved—even our youngest citizens realize that a clean environment and conservation of our natural resources mean a better quality of life for all. DEP salutes all the participants!

U.S. Savings Bonds and plaques were presented to first prize winners; plaques to second and third prize winners.

POSTER PHOTOS BY PATTY NOWOSIELSKI



Primary grades: 1st prize—Sherry Ann Seminski, 1st grader, Holy Rosary School, Perth Amboy. "Uses of Water."



Intermediate grades: 1st prize—Christopher Kratt, 5th grader, Central School, Warren. "Be Smart, Save Water."

High School: 1st prize—Lori Pike, 12th grader, Cherry Hill High School East, Cherry Hill. "Reserves are slipping when we're dripping. Every drop counts."

Continued on page 16H

Free Booklet

PROTECTING WETLANDS

The wetlands of the United States have been destroyed at an alarming rate.

Half of the original wetland acreage of the lower 48 states has been lost; the half that remains has been so severely modified that its functional values are significantly impaired. Over the last 30 years, destruction of this valuable habitat has resulted in the dramatic reduction of Atlantic Flyway duck populations and an 80 percent decrease in the commercial fish landings of estuarine-dependent species in Connecticut, New York, and New Jersey.

Man's encroachment on this land/water interface is one of the subjects discussed in the American Littoral Society's newest publication, *Protecting Wetlands: What you Should Know.* This booklet deals with elements unique to wetlands—their hydrology, the variety of plant and animal life they support, the significant losses they have sustained, and the Army Corps of Engineers permit program responsible for their protection.

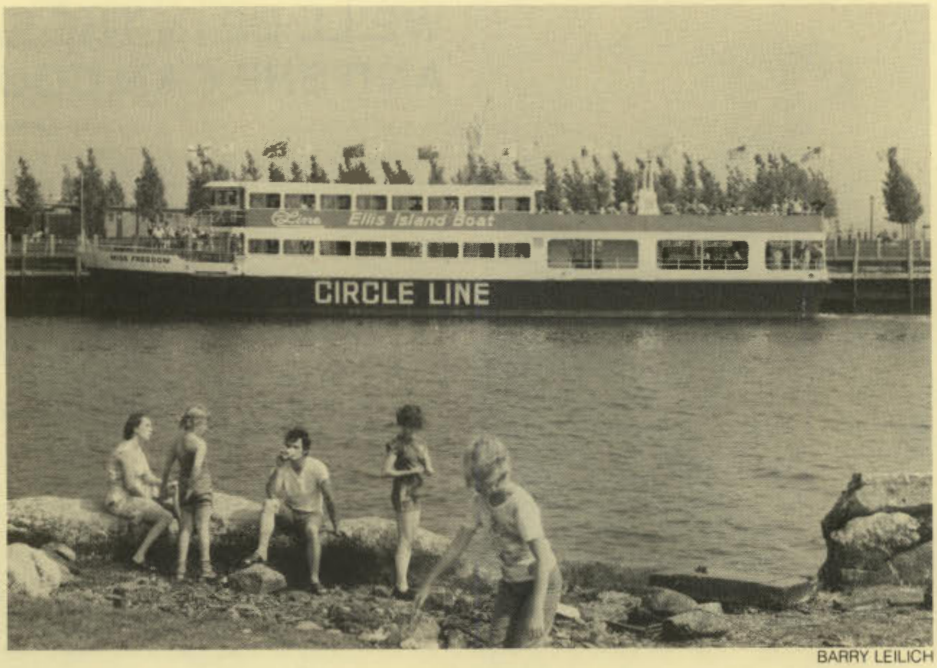
This illustrated booklet has been designed to be a concise, practical reference work. The information it provides responds to the needs of the naturalist, the educator, the contractor, and the public official interested in the wildlife and the values of salt and freshwater wetlands as well as the regulations that safeguard their resources and guide their use.

A guide to the federal and state (New York and New Jersey) agencies and individuals involved in wetlands protection is listed on the booklet's back page.

Up to 25 free copies may be obtained by sending requests to Wetlands Booklet, American Littoral Society, Highlands, N.J. 07732. For more information call Paul Dritsas at (201) 291-0055. □

SEA GRANT TODAY

Sea Grant Today is the magazine of the National Sea Grant College Program. It is published every other month by the Virginia Polytechnic Institute and State University in Blacksburg, Virginia. The magazine features articles on marine research and education programs, and it announces newly published research in a large variety of marine topics. The publication is supported by the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce. If you are interested in receiving *Sea Grant Today*, it is available free of charge by writing to the Extension Division of Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061. □



BARRY LEILICH

BOARDING 'MISS FREEDOM' FROM LIBERTY PARK PIER. The popular ferry service from Liberty State Park to Liberty Island and Ellis Island began its 1981 schedule of three trips a day, seven days a week, on April 25. The service continues through the summer and early fall.

Boats leave Liberty State Park for the Statue of Liberty at 10:30 a.m., 12:45 p.m., and 3 p.m. Boats leave Liberty State Park for Ellis Island, "America's Immigrant Gateway," at 10:30 a.m., 1:15 p.m., and 3:30 p.m.

The fees for the ferry service: Adults, $1.50; Children under 12 years of age, 50 cents; Groups (more than 25 persons), $1.20/person; Groups of High School students, $1/person; Groups of Boy/Girl Scouts, $1/person.

Circle Lines, in cooperation with DEP and the National Park Service, operates the ferry service. Liberty State Park is reached by car from Exit 14-B of the New Jersey Turnpike, or by bus from Journal Square in Jersey City. For additional information, call 201-435-8509.

ROLLINS ENVIRONMENTAL SERVICES PLANT CLOSED

The temporary operating authorization for Rollins Environmental Services, Logan Township (Gloucester County), was not renewed because of environmental problems with the facility. The authorization expired on May 15. Commissioner English stated, "Since it was not renewed, the Rollins plant must immediatley close and cease acceptance of all waste materials until further notice."

The Rollins plant is the state's largest hazardous waste treatment facility, according to Jack Stanton, director of DEP's Division of Environmental Quality. "The decision to not extend their authorization is extremely significant and was not made lightly—the decision was based on the company's failure to adhere to the conditions set forth in their temporary operating authorization," he said. These included failure to submit—engineering reports, designs and plans; a personnel training curriculum; fire fighting prevention plans; certain financial guarantees; and a facility closure plan.

In addition, three recent incidents have raised grave questions concerning the safety of the facility's operations, according to Keith Onsdorff, chief of Enforcement for DEP. The company experienced an incinerator blowout and fire on May 4, 1981, and in mid April a tank severly overheated when incompatible wastes were mixed, releasing acid gases into the air. A deleterious air pollution emission also occurred in April.

DEP is concerned with the loss of this plant for hazardous waste treatment and disposal. "However, we are vigorously policing all hazardous waste treatment facilities and have extended every opportunity to the Rollins company to come into complete compliance. Yet, long standing problems remain," said Onsdorff. The Rollins facility has been closely scrutinized and heavily investigated by DEP since 1977 when an explosion and fire resulted in a forced shutdown of the facility for more than six months. □

NJPTV SERIES—LURE TO NEW JERSEY OUTDOORS

Everything you ever wanted to see in New Jersey—the colors of Autumn, oyster farming, dog sled racing and a myriad of other natural and human events—but didn't know where to look is revealed in a new TV series called NEW JERSEY OUTDOORS. (The similarity to the name of this magazine is not coincidental.)

New Jersey Public Television is broadcasting—and has scheduled re-broadcasts during daytime hours, beginning in the fall—a 26-part invitation to New Jerseyans to learn to enjoy the rich, natural heritage and recreational facilities available to them. The series, hosted by Pete McLain, deputy director of the Division of Fish, Game and Wildlife, is being developed in co-operation with that division and focuses on the wide range of wildlife and outdoors activities in the state.

New Jersey OUTDOORS Host Pete McLain

Like most TV programs, some of the "best" parts of the shows—the "outtakes"—will not be seen by NJPTV's general audience. One scene viewers will miss, for example, according to NEW JERSEY OUTDOORS producer Lowell Shaffer, is host McLain toppling from a canoe into a pond of Water Lilies.

What audiences will see is the excitement of youngsters learning to fish (TAKE A KID FISHING), the enjoyment of hiking along the Appalachian Trail (A FEW MILES OF HISTORY), the return of wild turkey hunting season to the Garden State (WILD TURKEY-WILD TURKEY), and, among a variety of other things, expert fishermen Russ Spinks and Fred Lewis trolling for shad on the Delaware (AN OCCURRENCE ON THE DELAWARE).

Shaffer, also producer of THE RETURN OF THE PEREGRINE FALCON and ENDANGERED SPECIES IN NEW JERSEY, credits McLain with originating the idea for the series. "He came to me with some film on the Peregrine Falcon and asked if I could do something with it. Then we talked about an all-outdoors series," Shaffer said.

When Shaffer went to Gary Nenner, NJPTV's program director and executive producer, with the series concept, Nenner was impressed and approved the proposal. From then on, it's been hard and rewarding work for Shaffer and NEW JERSEY OUTDOORS co-producer Doug Saunders.

The series opened with A SENSE OF VALUE, a kaleidoscopic portrayal of New Jersey in its four seasons, narrated by actor Gary Merrill, and is being aired on alternating Mondays at 9:30 p.m., on UHF channels 23, 50, 52 and 58.

The state network has already interested several prospective underwriters in the series and expects programs on the breeding, training and trials of hunting dogs (A DOG'S LIFE), ice boating and surfing to attract other backers.

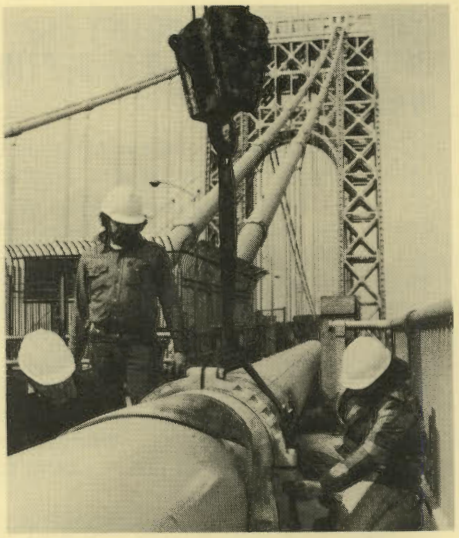
WILD TURKEY-WILD TURKEY helped herald the return of wild turkey hunting to New Jersey and stimulated interest among hunters and would-be hunters, judging by mail received by NJPTV after the program was shown. And that, of course, is exactly what NJPTV expects to do—arouse interest in New Jersey outdoors.

New Jersey Outdoors magazine editor, Steve Perrone, was asked to serve on a 13-member advisory committee that helped select subjects and set production standards for the series. Also: New Jersey Secretary of Agriculture Philip Alampi, Nash Castro, General Manager of the Palisades Park Commission, representatives of national outdoors publications and various New Jersey divisions and departments concerned with environmental protection and wildlife preservation.

What the committee developed is a concept that would span the length and breadth of the Garden State, focusing on such industries as horse breeding and racing to party boating and surfing, and the fruits of a New Jersey harvest to the preservation of endangered species.

The series is a colorful lure to New Jerseyans of practically all ages, and both sexes, to take themselves to their state's trails and slopes, whether for winter skiing, hiking, biking or horseback riding—to cast their lines in the lakes, streams, rivers and shore waters; to deep-sea fish, hunt, explore and camp.

Whatever the choice might be, one show in the series shall be devoted to a lady well known and highly respected for her skill with a rod and reel. Shaffer describes Marie DeSaules (MARIE) as "... an artist, woman, student, professional crabber, expert at clamming—a complete outdoor person." She is an important part of, to borrow from Shaffer, a complete outdoors TV series. □



Construction crews began building the two-mile pipeline across the George Washington Bridge in March. At the same time, work began on a new pumping station on the New York side of the Hudson River near the New York City Aqueduct. The completion of this emergency water supply project is expected in early summer.

Continued from page 16A

WATER CONSERVATION

sewage to fresh water in the river during the low flow. A pipeline (24-inch pipe used) across the George Washington Bridge was due for completion during June. This can deliver 20 mgd of New Jersey's Delaware River allotment through the New York City system to the Hackensack Water Company. Planned only for emergency use, the pipe on the bridge can be removed for storage when not needed. Piping at both ends of the bridge is to be permanent.

Another major improvement involves an enlarged interchange facility between the Elizabethtown Water Company and the Newark municipal water system. The first stage will raise the water transfer capability from Elizabethtown to Newark to 30 or 35 mgd, compared with the existing interchange capability of only 16 to 20 mgd. And, two new, major interconnections will be constructed to facilitate better transfer of water between the major water systems. Work is also underway to investigate the potential of new well fields in the northeastern part of the state as emergency backup supplies.

In addition, pipe and pumps used during the winter to pump 25 mgd from Lake Hopatcong into the Jersey City reservoir system was being kept in readiness for further use if necessary. Pumping 10 mgd daily from Lake Wawayanda to the Newark reservoir system, dating from the autumn of 1980, was stopped in mid May because of higher reservoir levels. This capability will also be retained.

PUBLIC URGED TO NOTIFY DEP OF ILLEGAL DUMPING OF SEPTIC WASTE

DEP calls on New Jersey residents to help, through observation and swift reporting to both the department and to local municipal police, in the state's effort to stop illegal dumping of septic waste. The department has intensified its surveillance and enforcement activities aimed at stopping this illegal dumping, especially since the March 15 deadline for septic waste dumping in the state's landfills. Toward this end, DEP has established a cooperative enforcement program involving local public health officials and local citizens.

The regulations adopted by DEP provide for safe disposal of the noxious wastes pumped from septic tanks in sewage treatment plants throughout the state. "Ending the practice of disposal of septic tank residues in garbage dumps is an extremely important step in protecting water quality, and, although there may be a temporary increase in the cost of cleaning out septic tanks, this was a vitally necessary action taken by the Legislature," said Commissioner English. "In the past we were subsidizing our waste disposal budgets with our water quality."

Alert enforcement action is crucial to stop the illegal discharge of septic wastes into forests, streams and sanitary storm sewers. The Commissioner urged all citizens to be alert to this problem, and to report any suspicious activity to DEP and to local municipal police. The department maintains a 24-hour Action Line to receive calls about any urgent environmental problem. The number is 609-292-7172. □

YOUNG CONSERVATIONISTS ARE WINNERS

Four New Jersey children recently won prizes in the annual Ranger Rick's Nature Club poster and essay contest. They are 7-year-old Kevin Hudenko of Oakland, N.J.; 10-year-old Kenneth Linger of Bridgewater, N.J.; 10-year-old Zoe Miller of North Plainfield, N.J.; and Elana Seifert, age 10, of Butler, N.J. Each received a Ranger Rick treasure chest for being among the sixth place winners. In all, 118 winners were chosen from 4300 5- to 15-year-olds who had entered the contest from 34 states, Chile, France, and Canada. First place prize was an all-expense-paid trip for the winner and her parents to the National Wildlife Federation's Conservation Summit in the Colorado Rocky Mountains this July. The contest was sponsored by the National Wildlife Federation, and rules were published last September in *Ranger Rick,* the NWF's monthly children's magazine.

MICHAEL BROOKS

HISTORIC WOODBINE SYNAGOGUE. In 1896, five years after the community of Woodbine (Cape May County) was founded as a haven for East European Jews—victims of religious persecution in Russia and Rumania—the Woodbine Brotherhood Synagogue was dedicated as the religious, cultural and educational center for the agricultural colony. Constructed entirely by the colonists using all local materials, the synagogue's design blends American ways with religious tradition. Externally, it presents a solid and simple American civic composition, while at the same time, internally, it conforms to traditional Orthodox Jewish design requirements. Woodbine Brotherhood Synagogue was placed on the State Register of Historic Places in June 1980, and on the National Register of Historic Places in September 1980.

CAFRA PERMIT APPROVED FOR MGM-HILTON CASINO

DEP recently approved a construction permit under the Coastal Area Facility Review Act (CAFRA) for the new MGM-Grand and Hilton Hotel-Casinos. Located on a 29-acre site near Harrah's Marina Hotel-Casino, across the street from the Senator Farley State Marina, and next to Absecon Inlet, the large scale facility will be built in two phases. When completed, the complex will offer a total of 4,000 hotel rooms, two 70,000-80,000 sq. ft. casinos, theaters, meeting rooms, and restaurants overlooking the State Marina and Absecon Inlet.

In conditionally approving the CAFRA permit, David N. Kinsey, director of DEP's Division of Coastal Resources, said, "The MGM-Hilton hotel-casino complex is the largest hotel-casino reviewed and approved to date." (DEP has approved CAFRA permits for 14 casinos, denied a permit for one casino, and applications are pending for two casinos.) Kinsey said, "It is exactly the type of large-scale, convention-resort facility the casino referendum intended to attract to Atlantic City. The sheer size of the complex and its location away from the traditional boardwalk area offers advantages and disadvantages in terms of transportation access. The concerns prompting the conditions attached to the MGM-Hilton CAFRA permit are related to street improvements and on-site parking. These included protecting air quality, avoiding traffic congestion, promoting and not precluding public transit in the city." □

BOATING WORLD UNLIMITED

With the publication of the first issue of *Boating World Unlimited*, those interested in the participation of disabled people in boating have gained a unique resource. *Boating World Unlimited* is published by the Handicapped Boaters Association, a non-profit, membership supported organization, which seeks to share information with those who can most benefit from it.

"Boating World Unlimited is really a 'first' in the field," states Gene Hedley, President and founder of HBA. "The articles and resources found in our magazine are geared to providing the information which will help solve the problems facing all disabled boaters: how to get started, access to boats, boating facilities, boating programs, and especially products which make boating easier and safer."

Disabled people are not the only ones who have become interested in this kind of information. "The family and friends of disabled people, professionals in recreation and rehabilitation, the marine industry, USCG and its related organizations, as well as state and local agencies are requesting more information about the disabled in boating," states Gene Hedley.

Boating World Unlimited is published bimonthly and is provided as a service to members of the Handicapped Boaters Association. All those wishing to receive a complimentary copy of the magazine and membership information should write to the Handicapped Boaters Association, P.O. Box 1134, Ansonia Station, New York, N.Y. 10023, or call (212) 877-0310. □

ATTENTION HIKERS: MAPS AVAILABLE

New Hikers Region Maps are now available to hikers and nature lovers in the state. Some of the most recently revised ones are:

No. 15 Ramapo Mountains, Wanaque-Suffern
No. 21A Sterling Forest, Greenwood Lake N.
No. 21B Sterling Forest, Greenwood Lake S.
No. 36A Bearfort Mt., Wawayanda Plateau E., Pequannock Watershed
No. 36B Wallkill-Hamburg Mts., Wawayanda Plateau W., Pequannock Watershed
No. 37 Wyanokie Plateau, Butler-Ringwood
No. 52A High Point State Park-Stokes State Forest, Kittatinny Mts.
No. 52B Stokes State Forest, Kittatinny Mts.

Each costs $1.95, or they can be purchased in pairs as a MapPak for $2.95 at most sporting goods stores and bookstores. If you want a more complete listing of Hikers Region Maps, a key map is also available. Ask your sporting goods dealer about it, or send a 20¢ stamp for your free copy to Walking News, Inc., P.O. Box 352, New York, N.Y. 10013. All maps are printed on paper that is waterproof and tearproof.

The New York-New Jersey Trail Conference also has trail walker maps available. Of particular interest to the New Jerseyan are:

- Jersey Highlands Map Set
- Appalachian Trail Guide (The Trail in New York and New Jersey)
- Guide to Ski-Touring in New York and New Jersey, 29 Areas

For these, write to New York-New Jersey Trail Conference, Inc., 20 West 40 Street, New York, N.Y. 10018. □

HELICOPTER SURVEYS RADIATION LEVELS

Aerial radiological surveys of three New Jersey communities were conducted in late May as part of a routine U.S. Environmental Protection Agency (EPA) program to gather information on radiation levels in areas surrounding former mineral extraction and refining facilities. The surveys of Gloucester (Camden County), Orange (Essex County), and Wayne Township (Passaic County) were conducted by EG & G, Inc. of Las Vegas, Nevada, a contractor for the federal Department of Energy. These surveys were requested by DEP.

The specially-equipped helicopter was flown at an altitude of approximately 150 feet above ground, and recorded ter-

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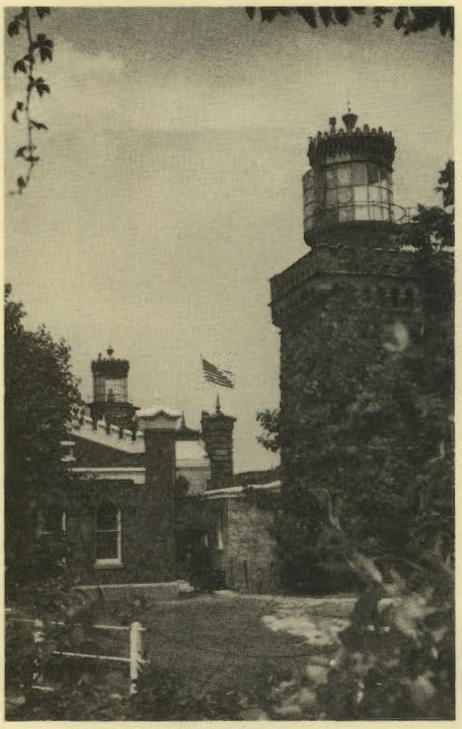

FUNDING SHORTFALL MAY LEAD TO PARK CLOSURES

Commissioner English on May 12 announced that because of the projected budget shortfall in the State Park Services' operations funding for the State's Fiscal Year 1982 (July 1, 1981-June 30, 1982), implementation of selected park closure procedures has been directed by DEP Assistant Commissioner for Natural Resources Donald T. Graham. Twin Lights Historic Site (above) is one of 11 park areas facing closure.

In developing the budget, DEP was faced with a choice between a major increase in funding for hazardous waste management or in the State Park Services Program. "Our number one priority had to be the control of toxic and hazardous materials," said Commissioner English. "No other area has generated so great a demand by the public for a response from government." DEP therefore allocated the major part of its budget increases to hazardous waste management. "Accordingly, no increases were sought in the Parks' budget," said Commissioner English, "in fact, the budget may be curtailed by the possible closure of 11 facilities."

These increases in DEP's hazardous waste management areas will provide for a massive expansion of enforcement, engineering and monitoring programs. A total of 68 new staff people would be added to investigate violations of the department's hazardous waste regulations. Substantial increases in landfill engineering and enforcement staff is also planned.

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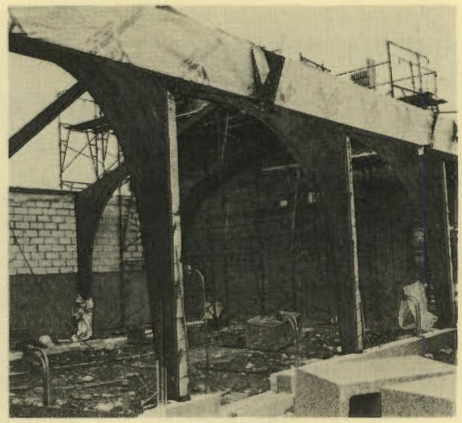


AUGUST 1980

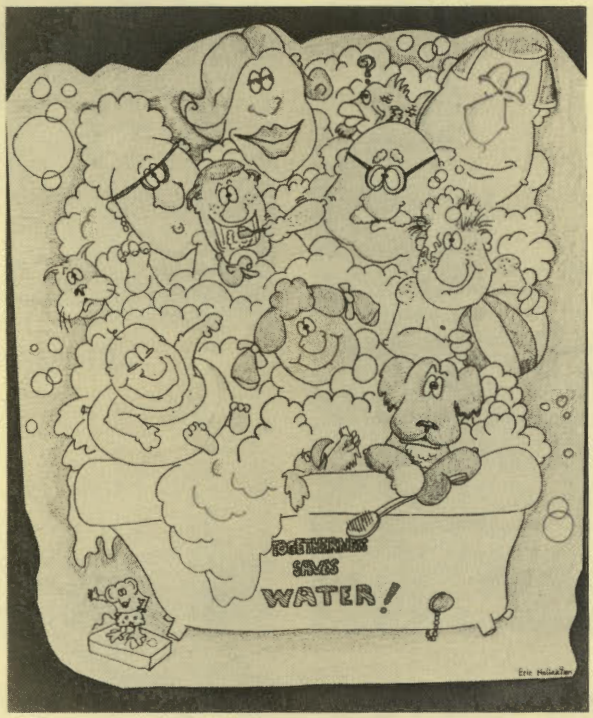
JANUARY 1981

PEQUEST FACILITY TAKING SHAPE

Construction of the Pequest Trout Hatchery/ Conservation Center is proceeding on schedule. Roland Spressart, chief of DEP's Bureau of Capital Improvements, reported that as of May 7 four of the major buildings were already under roof—Lighthouse and Nursery, Vehicle Storage and Maintenance/ Garage. The walls of the Interpretive and Education/ Administrative building were up; the elevated bulk feed storage hopper in place. The four 500 ft.-long upper raceways were ready for the connection of water piping, and the four 300 ft.-long lower raceways were taking form. (It is here that trout fingerlings will be raised to 10-inch length, a proper size for stocking streams. The entire process of rearing fish will be visible and understandable to the thousands of students and other visitors to the facility.) At present the only vehicular access to the facility is by way of a two-lane country road that branches off from Rte. 46, through Townsbury and westward to Rte. 31. To meet the needs of the sportsmen and the busloads of school children, an improved access route to the site is essential. DEP is working with the State Department of Transportation to determine the best route.

Continued from page 16C

POSTER WINNERS



Junior High: 1st prize—Erick Hollekim, 7th grader, North Plainfield Middle School, North Plainfield. "Togetherness Saves Water."

POSTER WINNERS

Primary Grades: 2nd prize—Shawn Gargulio, 3rd grader, Grandview Elementary School, North Caldwell. 3rd prize—Mike Brennan, 3rd grader, Christ the King School, Hillside.

Intermediate Grades: 2nd prize—Penny Larson, 4th grader, John Hill School, Boonton. 3rd prize—Rick Tokarski, 6th grader, Roselle Park Middle School, Roselle Park.

Junior High: 2nd prize—Gerard Stocker, 8th grader, William Annin Junior High, Basking Ridge. 3rd prize—Mark Giles, 7th grader, Samuel E. Shull School, Perth Amboy.

High School: 2nd prize, Emely Padilla, 10th grader, Perth Amboy High School, Perth Amboy. 3rd prize—Lazlo Pataki, 10th grader, Passaic City Technical Vocational High School, Wayne.

ESSAY WINNERS

1st prize—Chris Beste, 8th grader, American Boychoir School, Princeton. The theme of his essay is water conservation in New Jersey's water crisis. The attitudes, reactions and approaches of different individuals to a common problem are explored through the novel setting of a group conversing at dinner.

2nd prize—Steven Hummel, 7th grader, St. Francis Academy, Union City.

3rd prize—Jeanine Melehan, 9th grader, Academy of the Holy Angels, Demarest.

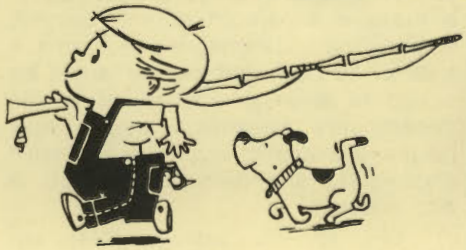
Continued from 16C

Commissioner's Remarks

I appreciate the public support given our environmental programs and the dedication of DEP's 3500 people to things and events—large and small—a successful Natural Resources bond issue, and a new one on the way to resolve our water supply problems, Superfund finally passed and now to be funded, Pinelands preserved with the task of protection far from finished, sewer treatment plants yet to be built and peregrine falcons to soar . . . nuclear drills rated superior and excellent, the first pesticide lab in the world under construction, and maybe, even a building for DEP!

I don't know if a resume will be able to convey what I think about all of you. You have had a mind altering effect on the way I think about these issues and indeed, on my vision, too. We still have Riverlands Renaissance to rebuild and dams to repair, resource recovery plants to build and crimes against the earth to avenge.

Our stewardship is far from finished. It is after all a life's calling of profound dimensions. One thing is certain, WE'LL BE IN THE EARTH'S CORNER—AND SHE CAN COUNT ON IT!



Continued from page 16G

FUNDING SHORTFALL

According to the Commissioner, "the only possible hope that we can have these vitally needed personnel and still preserve and properly maintain the parks is in the form of State Assembly Bill A-2282. This measure, if enacted, would establish a fee on waste disposed of in New Jersey landfills. That fee would then generate sufficient monies to cover our budget for solid and hazardous waste management. DEP could then dedicate the entire balance of its budget increases to the parks program."

The 11 parks earmarked for closure to the public are—Cape May Point State Park (SP) (Cape May County); Fort Mott SP (Salem); Rancocas SP (Burlington); Twin Lights Historic Site (Monmouth); Washington Rock SP (Somerset); Hacklebarney SP (Morris); Prospertown Recreation Area (Monmouth); Monmouth Battlefield SP (Monmouth); Jenny Jump State Forest (Warren); Ramapo Mountain State Forest (Passaic/Bergen counties); and Wawayanda SP (Sussex/Passaic).

These areas will be put into caretaker status to protect and preserve the public investment. A $300,000 savings in operational funds is anticipated. However, a $1.2 million shortfall is projected including cancellation of all scheduled equipment replacement and deferred maintenance on buildings, equipment and vehicles.

Commissioner English further states that these necessary actions will compound for years to come the critical maintenance problems in the park system. "These problems have accumulated since 1975 when State Park fees were raised 96 percent to offset a projected deficit. This strategy was unsuccessful in solving the fiscal problem and there seems to be no alternative to our present problem but to go forward with this unprecedented action at this time."

Continued from page 16G

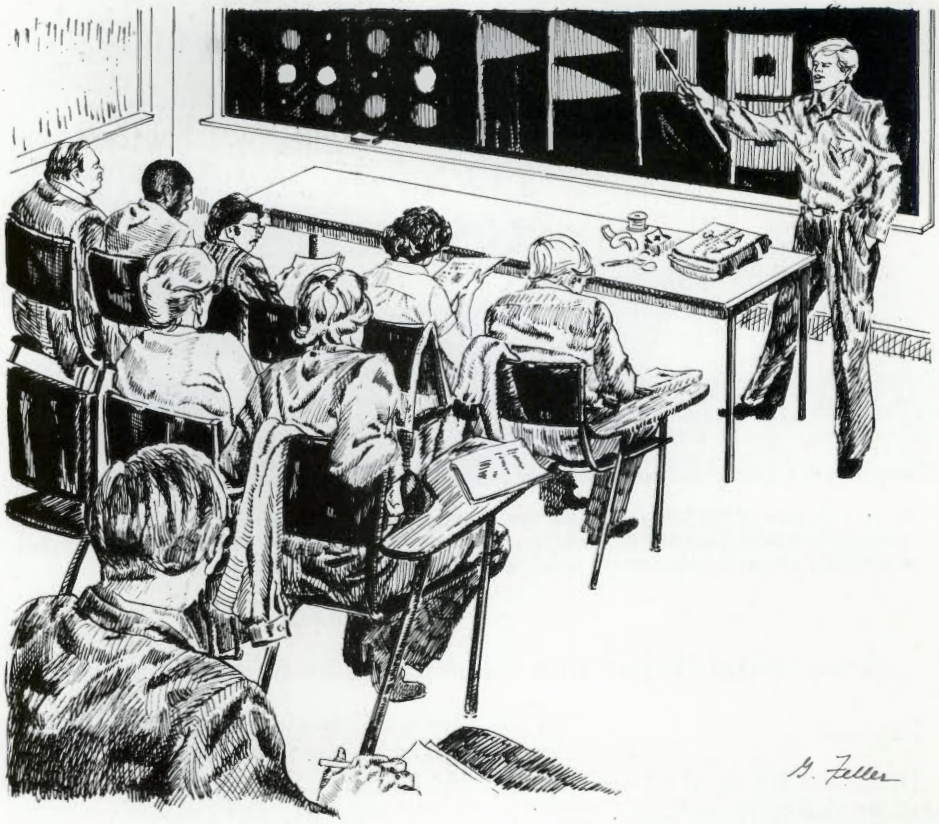
HELICOPTER SURVEYS

restrial (land) radiation profiles over 16 square mile areas centered in Gloucester at a former mesothorium facility, a former radium facility in Orange, and a former rare earths and thorium facility in Wayne Township. Data processing for aerial radiological surveys usually requires two or three months. All analytical results will be forwarded to DEP for evaluation. □

TO REPORT ABUSES OF THE ENVIRONMENT CALL ACTION LINE 609-292-7172

water safety

Text and Illustrations By GENE FELLER



New Jersey is a state that swimmers and boatowners alike should appreciate living in. Its geography lends itself superbly to water recreation.

New Jersey has 710 square miles of water surfaces, which include more than 800 lakes and ponds. Reservoirs such as Spruce Run and Round Valley in the Hunterdon County area are open to the public for recreational use, including swimming and boating. Almost every community has access to a swimming pool or at least is within a short distance of one.

Sadder statistics tell us that last summer New Jersey had 124 accidental drownings, 267 boating accidents involving 344 boats, 139 boat-related injuries and 23 deaths. The damage totaled $1,065,000.

We can minimize the occurrences of swimming and boating accidents by taking advantage of the many water safety courses available to the general public. For example, the American Red Cross Community Services provide a host of courses which include First Aid, Water Safety and Craft Safety.

The Red Cross, being sensitive to the fact that accidents are the leading cause of death among people 1-38 years old and also the fourth leading cause among persons of all ages, has developed a first aid program which aims to protect and save lives. This program includes Basic First Aid, Standard First Aid and Personal Safety, Advanced First Aid and Emergency Care, and Cardiopulmonary Resuscitation (CPR).

Water Safety courses are also available in swimming, lifesaving, and rescuing skills to ensure safety

and enjoyment in aquatic activities. The Red Cross notes that drowning is the leading cause of accidental deaths and that more Americans than ever before participate in water-related recreation.

All swimming courses are taught by demonstration and skill practice with emphasis on safety. There is a course for your no matter what your experience, even if you are mentally and/or physically impaired. There are five courses on swimming ranging from Beginner to Advanced and also a Survival Swimming Course.

Lifesaving courses cover all aspects of recreational safety on or near the water; they range from basic safety information for non- or novice swimmers to lifeguard certification. The courses include Basic Water Safety, Basic Rescue, Advanced Life Saving, and Advanced Life Saving Review.

Because more than 50 million people annually take part in recreational boating in our nation, the Red Cross finds it essential to include, as a public service, various courses on basic boat operation. These courses are in canoeing, rowing, outboard boating, and sailing. They are taught by qualified instructors utilizing texts and educational techniques such lectures, discussions. and on-the-water instruction.

The Marine Police assign six officers through their Trenton headquarters to conduct a basic course in water safety and seamanship called "Make Sure Make Shore." Its primary targets are the Middle Schools' 5th and 6th graders. They are at a good age to understand and retain the instructors advice and practice it.

The program consists of 4 to 5 one-hour sessions throughout the N.J. public school systems during the months of January through May

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N.J. Girl Scouts Are Introduced To Our Marine Resources

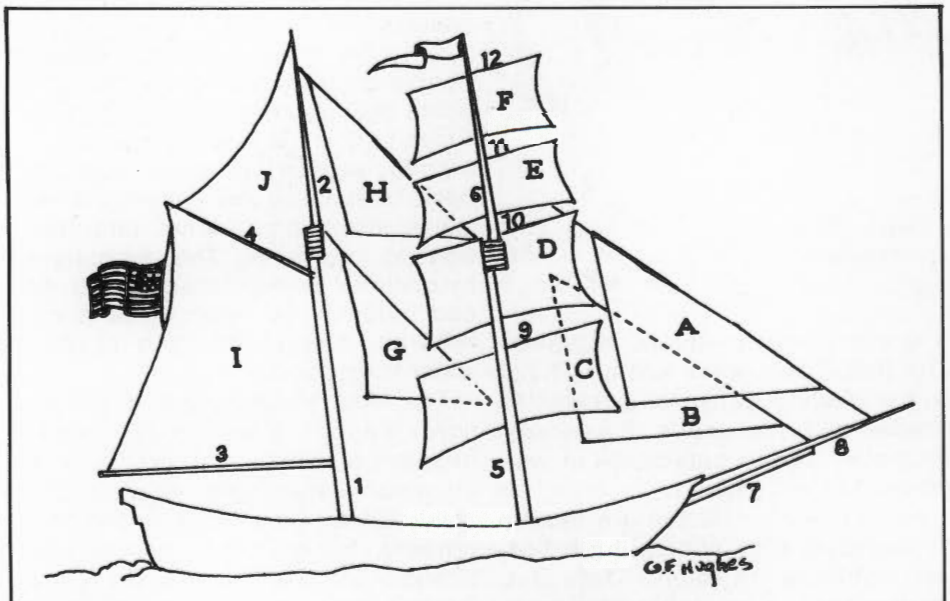
America's Queen of the Clipper Ships, the *Flying Cloud*. The original still holds the record for sailing from New York to San Francisco around Cape Horn. This 216-foot replica houses a multimedia show on tales of tall ships and Gardner's Basin history.

By: Janis Martin-Hughes with collaboration by Barbara Church

"Heave!"

Hand-over-hand lengths of hemp must be yanked in and eased out more times than you could begin to remember during one three-hour voyage. To keep the more than 5000 square feet of canvas on a sailing ship fully functional requires strength, skill, and vast knowledge of the wind and sea.

The vessel is the *Young America,* the largest square-rigged brigantine sailing ship licensed by the United States Coast Guard to carry passengers. The crew is the usual assortment of sunburned, brawny men, with one exception. This time they are assisted by scouts—Girl Scouts, that is. If you are wondering what the Girl Scouts are doing sailing on a 130-foot ship, then you probably don't know much about what the Girl Scouts are up to these days. If the words "Girl Scouts" only conjure up visions of little girls dressed in green toting the dieter's dreaded box of cookies, then think again.



SPARS:

1. MAINMAST
2. MAIN TOPMAST
3. MAIN BOOM
4. GAFF
5. FOREMAST
6. FORE TOPMAST
7. BOWSPRIT
8. JIBBOOM
9. COURSE YARD
10. TOPSAIL YARD
11. TOPGALLANT YARD
12. ROYAL YARD

SAILS:

A. OUTER JIB
B. INNER JIB
C. FORE COURSE
D. TOP SAIL
E. GALLANT
F. ROYAL
G. MAIN STAYSAIL
H. MAIN TOPMAST STAYSAIL
I. MAINSAIL
J. GAFF TOPSAIL

A new pattern has been developed for Girl Scout programs, based on the belief that learning and fun are most effective when different interest areas are offered so that girls can select activities to meet their own needs and interests. As part of Girl Scouting's continued efforts to ensure that its program is lively, innovative, and enjoyable, Girl Scouts of the United States of America has developed three new components of its program.

Let's Make It Happen!, From Dreams to Reality, and *Careers to Explore* offer new challenges for girls based on the changing values, lifestyles, and roles of both girls and women today. All these new programs offer an opportunity to explore interests as diverse as health care, airplane maintenance, sports, outdoor survival, and marine biology, all with a focus on career education.

A group of Girl Scouts from the Burlington County Girl Scout Council in New Jersey have been taking water samples, collecting marine specimens, and blistering their hands along with the crew of the *Young America* to gain personal understanding of the marine environment. The Girl Scout Council contacted the *Young America Marine Education Society* in historic Gardner's Basin, Atlantic City, to help with National Sea Grant marine resources educational program for Girl Scouts.

New Jersey is a Sea Grant state. This 12-year-old federal program is similar to the land grant college program; however, the funds are used to study, teach, and advise people about the sea. Girl Scouts in New Jersey have been granted funds under this program to develop informal educational activities dealing with fresh and salt water.

Historic Gardner's Basin enables them to visit one area representative of past and present marine activities. There is restored a typical New Jersey waterfront with a history rich in activities ranging from oyster fleets to rum running. Refurbished homes of ships' captains and crews dot the shore along with many vessels of the past. Some float exactly as they were sailed over 100 years ago; some are replicas of the originals.

The Girl Scouts explored New Jersey's nautical heritage by taking a trip

into the past on the *Young America* docked in Historic Gardner's Basin. The Young America Marine Education Society owns and operates the vessel and offered the Girl Scouts the opportunity to experience the romance of sail. The Girl Scouts joined the ship's regular crew and other passengers for a three-hour cruise. (The vessel is also available two times daily during the week and three times daily on weekends for up to 70 people to head for the open sea.)

The *Young America* is one of several wind-powered vessels still operating. The ship was constructed of steel and cement by a New York businessman for Windjammer cruises in 1975. Because of financial difficulties, it became the property of the Chemical Bank of New York. The bank sold the ship to the Young America Education Society which was formed to purchase and operate the vessel.

The *Young America* is equipped with two masts, 10 sails and a diesel engine in the event the wind does not cooperate. The girls learned to heave on the ropes and to secure the sails. To keep up a moderate speed of 10 knots the sails have to be turned to catch the wind. Terms such as "ready about" were quickly picked up by every Girl Scout. Those who fail to heed this rousing cry might find the main boom heading their way—a quick duck their only salvation.

After the girls regained their land legs back at the harbor, they settled down to the task of studying marine ecology. They were introduced to the Marine Mammal Stranding Center, under the direction of Bob Schoelkopf, which is also housed in Historic Gardner's Basin. Stranding Center personnel attempt to rescue all beached whales, seals, porpoises, and dolphins from Maryland to Connecticut. The center exists solely on donations and uses these funds to nurse sick marine mammals back to health, with the aid of a veterinarian. Autopsies are performed on those that cannot be saved and the skeletons are donated to The Smithsonian Institution for research.

Gaining a better understanding of some other aspects of the marine environment required a trip to the New Jersey Marine Sciences Consortium field station in Seaville. There, Director Tom Farrell, with the aid of several aquariums full of local marine species, gave an informative lecture on marine resources. Farrell explained that the most productive portion of the ocean is from zero to 500 feet the depth that sunlight reaches. The girls were then transported to the beach, issued large nets, and instructed on how to net seine for marine species. Water temperature and salinity tests were performed. Various fishes and horseshoe, fiddler, and blue-claw crabs were collected.

Next stop for the Girl Scouts was the Wetlands Institute in Stone Harbor. Here the girls learned the ancient Japanese method of fish printing called "Gyotaku." Anne Galli, the institute representative, explained that "Gyotaku" was used to document fish samples before the advent of photography. Using ink on a porous paper, fish species were "printed" to record anatomical detail. These prints were used in early marine studies.

After a full day at Historic Gardner's Basin and side trips to the New Jersey Marine Sciences Consortium field station and the Wetlands Institute, Burlington County's Girl Scouts experienced life in, on and along the ocean. Before this exploration few of the girls thought of the New Jersey shore as anything other than a resort area. As a result of their experiences the girls learned what most of us already understand—that the marine resources of New Jersey are an integral part of our environment. More than many of our surrounding states, New Jersey is truly focused on marine resources which account for a great deal of economic activity in the state.

This group of young women will soon be taxpayers, voters, and community leaders, and perhaps through experiences such as these described here they will become active in the preservation of New Jersey's coast.

Off to adventure! Passengers climb aboard the *Young America* with the able-bodied help of mate Lou Buck.

What ocean voyage is complete without sharing tales of the sea? Sea Grant Project Director Barbara Church entertains the girls with her salty yarns.

The Marine Mammal Stranding Center offers a report on the spring 1979 stranding of a pilot whale in Wildwood, New Jersey.

PHOTOS BY BARRIE LEITER

Leaming's Run Botanical Gardens

BY JEANNE QUINN

PHOTOS BY AUTHOR

It's called "an island of peace in South Jersey" and it is that with 27 colorful gardens separated by winding narrow pathways under a canopy of trees which often border on several small ponds and brooks.

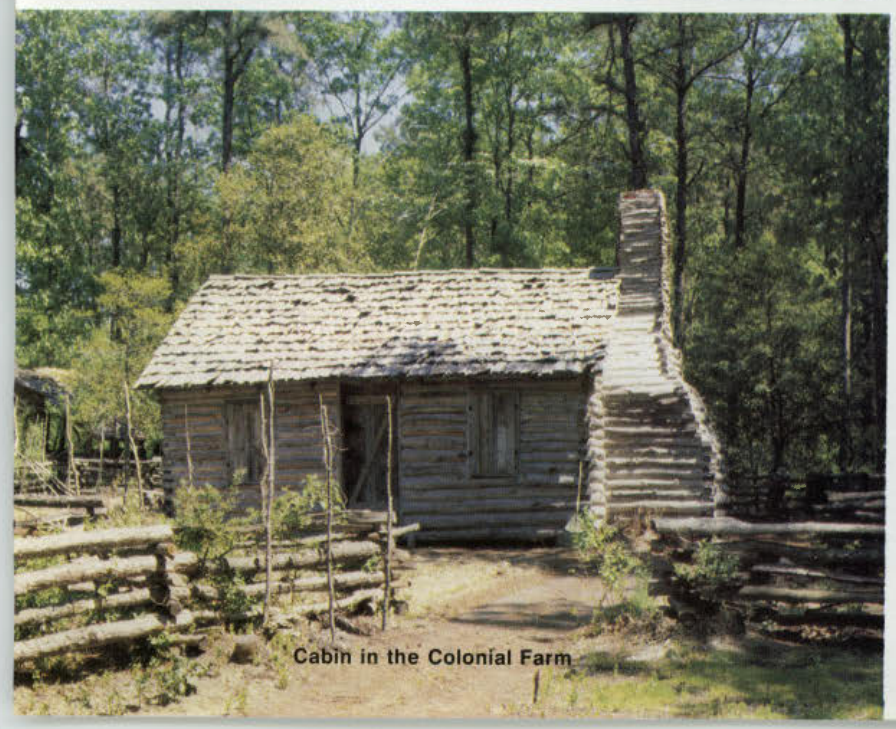
There's a Yellow Garden designed to give a quiet restful appearance . . . an Evening Garden which is best seen in the morning or evening. Enjoy the English Cottage Garden which contains a great variety of plants, and the Red and Blue Garden, called an aggressive garden because it mixes bright red flowers with bright blue flowers.

And just around the bend is the Orange Garden, in a brilliant display of color; and then the Corner Garden, the Serpentine Garden, the Everlasting Garden, the Snapdragon Garden, the Bridal Garden, and many more.

An interesting sight is the Colonial Farm as it was when Christopher Leaming first settled his 320 acres in the late 1600's. You'll see a cabin made from logs with a roof of hand-split cedar and oak shingles . . . and several outbuildings recreated from that period.

And after you've meandered through and inhaled the mixed aromas of the gardens, the last stop is The Cooperage and the Deep Woods Garden.

Leaming's Botanical Gardens are open daily from 9:30 a.m. to 5:00 p.m., July 1st to October 31st. The gardens are located on the west side of Route 9, Swainton, Cape May County, between Avalon (Exit 13 on Parkway) and Sea Isle City Boulevard. □



Cabin in the Colonial Farm

wildlife in New Jersey/ BATS

LITTLE BROWN BATS D.A. MORRIS

HOARY BAT D.A. MORRIS

RED BAT ANNE GALLI

BY DEBRA MORRIS

For centuries, bats have been associated in legend with witchcraft and sorcery, and from these superstitions and misunderstandings a fear of bats has been instilled in many humans today. This fear is entirely unfounded, as bats are harmless. Bats do not attack humans, nor do they, as tales suggest, become entangled in people's hair.

Bats have always been associated with doom and darkness. Throughout folklore, characters representing the Angel of Death and the Devil are portrayed as having bat wings. Other folk stories tell that storks placed green leaves in their nests to protect the eggs from the touch of a bat's wing; and that owls put a heart of a bat in their nest to ward off ants.

The Chinese, however, consider bats symbols of good luck, and much of their pottery contains designs of bats, symbolic of health, wealth, love of virtue, old age, and natural death. Additionally, the Cherokee Indians used the bat as an heroic symbol in certain ceremonial dances.

Bats, which probably evolved from the moles and shrews, are the only mammals that have achieved true flight. Greatly elongated forelimbs and "fingers" support thin membranes which form their wings. Although unlike most nocturnal animals, bats have very small eyes, they nevertheless can see well. Bats feed at night, and have developed an echolocation "sonar" system to aid in seizing insects and avoiding objects while in flight. The sounds emitted from the bat's mouth are of a high frequency ranging from 25,000 to 100,000 cycles per second (cps). By comparison, humans can hear (at the very best) frequencies only up to 20,000 cps. After detecting an insect with its sonar, a bat can twist and descend on its prey with ballet-like movements. The bat can catch the insect in its tail by stretching the tail membrane to form a basket. While continuing to fly, the bat then bends over and scoops up the prey from its tail. Bats can also catch insects using their wingtips. Some noctuid moths can detect bats' sonar signals and will make rapid zig-zagging dives to confuse the approaching predator. Bats occupy roosts during the daytime, hanging by the curved rigid claws on their hind feet.

Worldwide, there are 16 families of bats, three of which occur in the United States. The **Phyllostomatidae,** or leaf-nosed bats, which occur in the southwestern states, are basically fruit eaters, but they feed on nectar and insects. The **Molossidae,** or free-tailed bats, are common inhabitants of the southern United States. The third family, the **Vespertilionidae,** are found worldwide and occur in all 50 states. Contrary to popular belief, there are no vampire bats in the United States. The true blood-eating vampires are found only in Central and South America.

There are nine species of bats in New Jersey. These bats range from two to four inches in body length, with wingspreads of three to ten inches. The weight of a bat is comparable to that of a nickel. Their bodies are covered with fur in various shades from reddish to grayish brown.

New Jersey's bats inhabit either caves or trees. There are four tree bats: the commonly seen red bat, distinguished by its completedly furred tail and reddish-colored hair; the hoary bat, readily recognized by its yellow and white face and the white-tipped hairs which give it a "frosted" appearance; the secretive yellowish-brown eastern pipistrel, smallest of our bats; and the silver-haired bat, which has black hairs tipped with silver. The five cave-

dwelling bats include the Indiana, a federal and state endangered species; the Keen's, big brown, small-footed, and little brown bats. These bats have unfurred tails and are tan to dark brown. The most common bat in the northeastern United States is the little brown bat (**Myotis lucifigus**).

Most species of bats congregate in groups or colonies and occupy caves, hollow trees, attics, barns or other suitable roosts. Solitary bats tend to roost in trees (hanging from branches or hiding under loose bark) and behind window shutters. During the winter, the cave-dwelling species will hibernate together in tight clusters in caves and mines. A recent study, funded by the Endangered and Nongame Species Project and conducted by Dr. John Hall, a bat specialist from Albright College, indicated that one of the four active cave and mine habitat sites found in North Jersey harbors one of the largest colonies of little brown bats in the northeastern United States. The tree bats are usually migratory, moving south late in the fall and north in the spring, and will hibernate in hollow logs, trees, or abandoned woodpecker holes.

During the spring months, bats set up their summer roosts in natural caves and hollow trees or in barns and attics. Most of the bats that congregate in these colonies are pregnant females. The young are born in late May, June, or July depending on the species. The rate of population increase is not large. With the exception of the red bat, which has four young, most bats have one, sometimes two, young per year. Young bats drink the mother's milk for three to six weeks and are able to fly in about three weeks. The females do not usually fly with their young attached unless they have been alarmed or disturbed, but will leave the young behind when they forage for food. Not all the bats leave the roost every night; some will stay behind with their young and forage another night.

Adult males do not occupy the summer breeding sites, but roost singly or in small groups in trees, behind building shutters, or other nooks and crannies. Mating begins in August or September, when the young are the size of the adults, and continues through the fall, and sometimes through winter and early spring. Delayed fertilization is characteristic of bats reproductive cycle, meaning that the sperm is stored in the female during the winter months and actual fertilization does not take place until early spring.

When bats make their summer roosts in attics or parts of occupied buildings or barns, they may be objectionable because of the odor from the bat's urine and droppings, their high-pitched squeaking, and the noise created by their crawling.

Bats are able to enter buildings through unprotected louvers or vents, broken windows, holes in old siding and eaves, or open spaces. Small species of bat can crawl through openings as narrow as one-half inch in diameter; therefore, close inspection is necessary to locate and seal all possible entrances. One suggestion is to watch the building carefully for several summer evenings to determine at what time bats begin to fly out, usually 15 to 20 minutes after sunset, so that all the holes in current use can be located.

The best time to control the bat roost problem and close the openings and holes is when the bats have left the roost at the end of the summer. Bats raise their young through July. They start leaving the occupied shelter during August in search of a cave for winter hibernation. Usually by the end of September, depending on the climate, all bats will have left the roost.

At this time, small cracks and openings should be plugged or caulked and larger openings covered with wood, sheet metal, or small wire mesh (one-quarter of a inch or less) if ventilation is desired. Be certain that all the bats are out of the building before the bat-proofing work is completed. The bat-proofing should be completed before the spring to prevent the bats from setting up housekeeping during the summer.

The bat guano (droppings) can be cleaned out of the attic at the end of the summer to eliminate the odor which may attract new colonies of bats. A fiberglass surgical mask and gloves should be worn as a precaution against inhaling a bacteria found in various types of animal dung, which may cause an infection called histoplasmosis. Although it is generally believed that rabies virus is not transmitted by inhalation, two exceptions to this rule occurred in a cave in the West.

It was formerly thought that burning sulfur candles or sprinkling napthalene (mothballs) or paradichlorobenzene (insect repellent) over an area would help repel bats, but these methods are not known to be successful in controlling these animals.

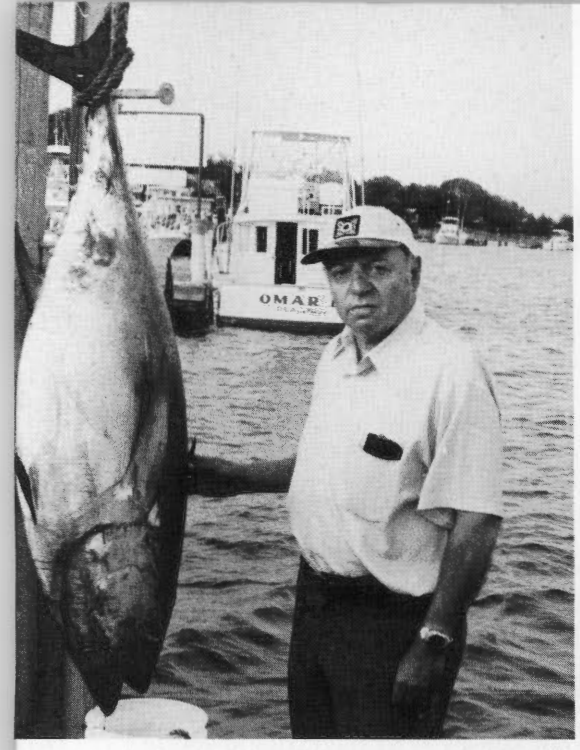
Rabies is carried by bats, but not all bats are rabid. Raccoons, skunks, squirrels, and dogs also carry rabies. An important rule of thumb is that the "abnormal is normal" for a rabid animal. A bat flying around during the daytime or flapping on the ground may not be a healthy bat. If someone is bitten by a bat, a physician should be called and an effort made to obtain the bat. The animal should be collected using gloved hands, a stick, or forceps and the local public health authorities should be informed of all circumstances.

In the last few years, scientists have noticed a serious decline in certain bat populations due to habitat loss, human disturbance, and insecticide poisoning. Presently, five species of bats are included on the U.S. Endangered Species List. Loss of their cave habitats has occurred through increases in surface mining operations, urbanization, cave commercialization, and construction of dams resulting in flooding of caves.

Bats are delicate creatures and the disturbance of their roosts, particularly while they are hibernating, can be detrimental. Many people are unnecessarily fearful of bats and not realizing the ecological importance of bats, kill them when given the opportunity. People exploring caves and mines disturb bats accidentally or kill them for "fun," another major cause for their decline. In Virginia, the U.S. Fish and Wildlife Service, in conjunction with the Fish and Game Commission, is putting gates across entrances to certain caves, determined to be critical habitat sites, to prevent human disturbance.

Why are bats important? They serve as natural insecticides, consuming their own weight in insects daily. Their guano is high in nitrogen and at one time was mined for fertilizer. Additionally, medical research is being conducted on the echolocation and blood circulation of bats; insights gained in these studies may benefit humans who are blind or ill.

For those who want to learn more about bats, two books are recommended: "Bats of America," by Roger Barbour and W.H. Davis, University of Kentucky Press; and "Lives of Bats," D.W. Yalden and P.A. Morris, Demeter Press.



A staple of the offshore scene. Author with yellowfin tuna that weighed in at 98 pounds.

Hudson Canyon and beyond

BY FERD DIPALMA

It was a case of age before beauty so I was given first shot at the fish that had taken our trolled lure with the authority that spelled tuna! Some 20 minutes later John Weber was able to grasp the leader wire as Al Bridges sunk the gaff into a longfin tuna—a for-real albacore that would go maybe 38-40 pounds. We are definitely in business! Ed Kluth was maneuvering *Sea Deuce* and trolling a criss-cross pattern along the eastern rim of the Hudson canyon, a deep trench gouged into the continental shelf by the tremendous flow of the Hudson River over immense periods of geologic time.

The east rim of the canyon—or the west shelf for that matter—is no place for a crew of novices. The trench follows a curving course some 80 or 90 miles offshore and a 48-hour gamefishing trip is not to be taken lightly. Fortunately for us we were following in the wake of *Sabre,* Steve Pepe's 28' flybridge Bertram. Steve is an experienced game fisherman and canyon runner.

Ed held his 30-foot Sea Ray in *Sabre's* wake as Steve maintained a steady course of 120 degrees out of Manasquan inlet. We arrived at the western dropoff some four hours later.

As our skipper throttled back to trolling speed, some 1400 rpm's, John and Al armed the rods with four different types of trolling lures. A green machine and a jet-head were let into the white water of the vessel's wake from the two seven-foot-long stern trolling rods. Two eight-foot-long "sharksticks" operated off the port and starboard outriggers. These pods were armed with a large mackerel clone to port and a kona head with its long vari-colored plastic skirt on the starboard side. These lures skipped on the surface of the white water, one 60, the other 90 feet back of the boat.

Our reels were International 50's filled with 50-pound-test monofilament line. The last 15 feet of line had been doubled back at the dock where Ed and John had collaborated in fashioning the bimini twist knots. Wire leaders were braided cable that tested out at 150 pounds and terminated in snap swivels of 200-pound test.

It had been only a matter of minutes before I had achieved my hookup with the albacore. By the time we had that fish boated two of the anglers on *Sabre* were in business. They eventually boated two yellowfin tuna that later proved to be in the 70-pound class. At this point all of us aboard *Sea Deuce* agreed that our best hookup had been the tie-in with Steve Pepe. He had steered us unerringly to a lucrative area of the vast big-water territory that harbored a great variety of gamefish. Steve comes to the offshore scene with impressive credentials. He has battled large makos and has won first place in the Manasquan mako tournament. Steve has taken big billfish and large tuna from canyon country and has always been helpful to newcomers.

As we continued to troll, the action intensified. Yellowfins in the 70- to 90-pound class hit our lures and fought with the dogged determination that is the hallmark of the great tuna family. There were double and triple hookups which resulted in some lost fish but who cared? On one occasion while Al was working a good fish Ed and John began to reel in the other lines. As John's lure moved across the white lacy froth no more than 10 yards from the vessel's transom, a white marlin breasted the water in a surging leap, holding the lure crosswise in its mouth. The leaping gamester waved his bill at us in a headshaking shower of spray and dropped the lure.

The radio crackled! A vessel on the far horizon was into a blue marlin. Another reported losing a mako shark. The blue-gray ocean was really alive!

Now the sun, partially obscured by clouds, hung low along the horizon. Action faded. *Sabre* radioed *Sea Deuce.* Instructions were to close in and follow on a course of 150 degrees to an area where we would drift away the hours of darkness. Thirty minutes later we arrived at the 500-fathom curve, a deeper portion of the trench which had, from time to time, yielded fine harvests of broadbill swordfish.

As we began the long nocturnal drift John set out the two "sharksticks" rigged for deep water drifting. 12—0 hooks were baited with whole fresh-frozen squid. The leaders were number 10 wire, tobacco-colored and 15 feet in length. The 200-pound-test black-barrel swivel connecting the leader with the double line also held a "lightstick," a six-inch plastic cylinder filled with two chemical agents. These, when mixed by breaking a seal, gave off an eerie yellow-green light which would last for several hours. Our baits, suitably weighted, were suspended in the depths, one 90 feet down, the other 150 feet down.

Looking down into the clear waters of the shelf we could see the glow of lightsticks. These rigs have been successful in attracting broadbills when these top-of-the-line gamefish were present. They will come up from the depths to investigate the strange light and, in doing so, will find an easy meal of squid. We were to learn that other night-cruising gamefish were also attracted to the artifical light.

The night drift was powered by stiffening winds which had moved great cloud banks and had obscured a thin sliver of crescent moon and most of the stars. Looking beyond

the dimly lighted stern cockpit was like peering into an immense void and the eye could discern no distinction between sea and sky—just complete and utter blackness.

By midnight the winds had steadied and *Sea Deuce* rolled in the trough of waves we could not see. Sea noises—the slap of wave against hull, the whistle of wind through overhead tarp—were occasionally interrupted by radio calls from unseen vessels. One simply wanted to know the time. Another discussed the weather. It was as though the night drifters wanted to reassure themselves that they were not alone.

At six AM it became possible to distinguish sea and sky. The rising rim of the sun, obscured by cloud cover, was just beginning to lighten the horizon when the starboard rig came alive. John had the rod in action within seconds, sure that he had a pretty good fish. Not large perhaps, by canyon standards, but definitely heavier by far than his 90-pound yellowfin of the previous afternoon. After some 45 minutes of hard struggling the fish seemed to be played out. By that time it had grown light and I had wakened our companions, who took their assigned stations. But the fish was not about to give in so easily. A deep run and John had to do it all over again. On the next approach everything went off smoothly and the team managed to sink the gaff and put a tail rope on a nice mako shark that eventually weighed in at a respectable 148 pounds.

With the coming of daylight the wind moderated and so did the sea. The sun, still veiled by filmy clouds, brought out a blue, Gulf stream-like tint to the calming water. *Sabre* was nowhere in sight. Radio contact involving a series of coordinate numbers soon brought the boats together at the east rim. While John had been battling the mako the people on *Sabre* had boated three yellowfins. We were in an area identified by a series of lobster pot markers. As we swept by a grouping of three we had a triple hookup. One 70 pound yellowfin was boated, two were lost. Nevertheless we had gotten into the pattern. As I brought the vessel to bear once more on the red lobster markers, the scene of the previous triple strike, we had a solid quadruple hookup. Ed, Al, and John emerged from the threatened shambles to boat three nice yellowfins. We weighed them that evening. The smallest was a 70-pounder, the largest pulled the marker to the 92-pound level.

Someone aboard *Sabre* had hung a large fish. Two hours and fifteen minutes later the tuna was boated. It was an Atlantic bigeye—*Thunnus obesus.* Back at Hoffman's Anchorage it pulled the beam to the 220-pound mark.

As we crossed the canyon to the western rim another white marlin surfaced in our wake but made no attempt to take the lure.

And that was it!

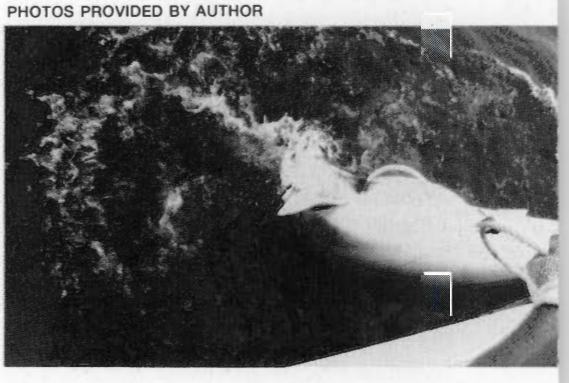
Anyone contemplating the canyon run must remember that it is big water out there. There are some big fish and a variety of them. To illustrate: The following week Steve Pepe and *Sabre* brought back a 225-pound broadbill and lost a really large blue marlin. Al Bridges on *Sea Deuce* brought to gaff a bigeye tuna that weighed 301 pounds, large for the species. And always there are the large sharks of the open ocean.

The voyage home consumed another four hours but the trip proved to be as pleasant as an excursion up the Hudson River. A flat sea, blue water, a wake of pure white froth gave silent testimony to the cleanliness of New Jersey's offshore waters. Sea life abounded. Porpoises played ahead of the bow quarters and further off a whale spouted once and then submerged. A 400-pound turtle, looking like an overturned bathtub, drifted nearby, its large carapace resembling a huge piece of tooled, antique leather.

An overnight trip to the Hudson canyon points up one element that should be kept foremost in the minds of everyone considering such an extended voyage. That element is *SAFETY!* Do make sure that the fuel supply can get you there and back with ample allowance made for the time spent trolling. This is not a matter for guesswork, most vessels making the run must carry an extra drum or two with a pump for transfer at sea. And *DO* be alert for any change in the weather. The canyon is not too far off when the winds are fair. But if the barometer should start to fall—get out of there—fast!

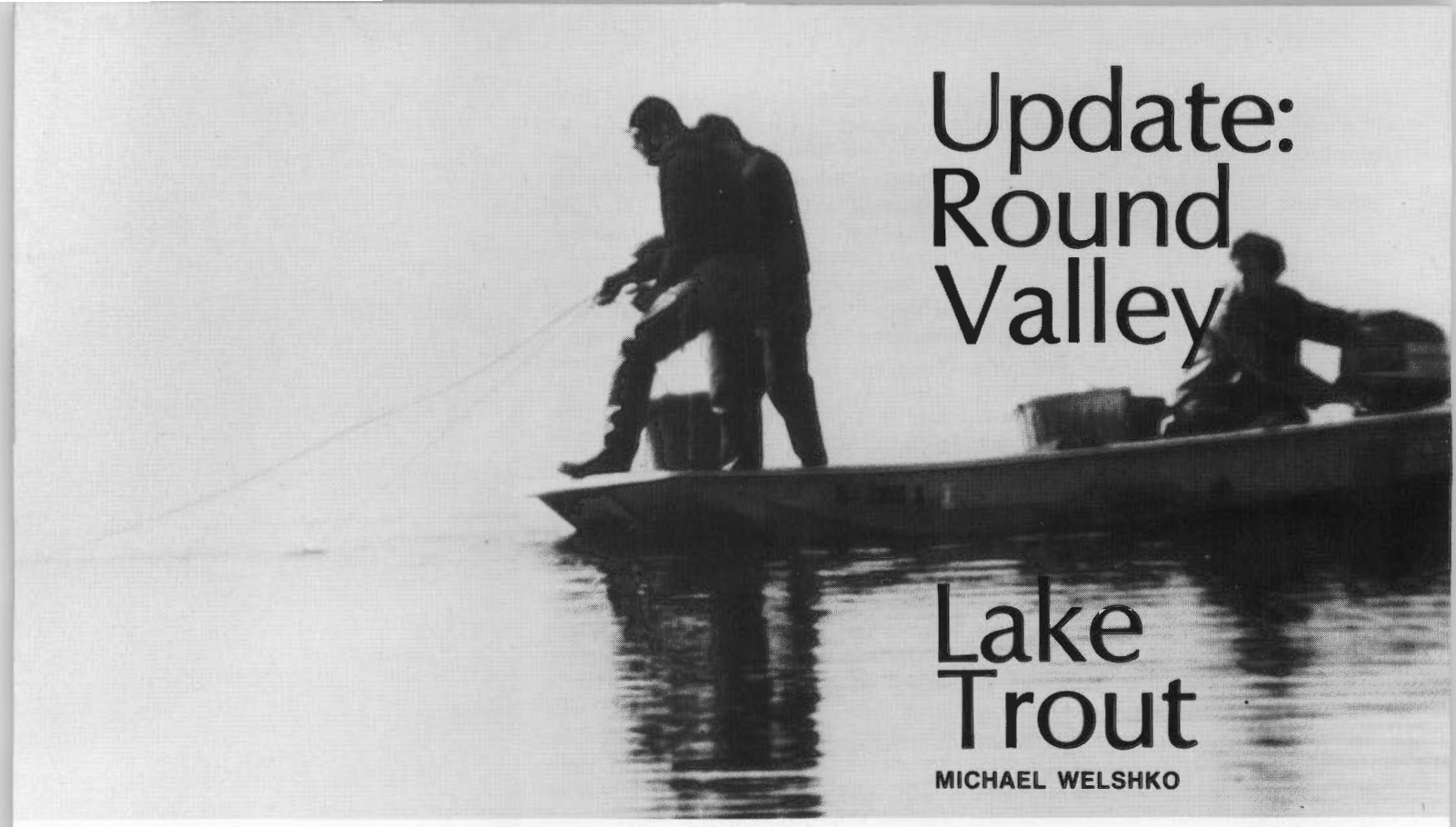
George Coats holds a pair of albacore, the best-tasting of all the tunas. They are readily identified by the long pectoral fins. In foreground is George's 140-pound Atlantic bigeye.

PHOTOS PROVIDED BY AUTHOR



Slipping a tail rope around a mean mako shark can be a tricky proposition. Not only are the jaws dangerous; the tail can pack a terrific wallop. John Weber's 148-pound specimen is just about finished.

But there is no real need to make the trip on your own. The Jersey shore boat basins have plenty of seasoned "pros" whose vessels make the canyon runs as a matter of course. When conditions are right and the gamefish are in a cooperative mood they can be counted on to help you bring in some of the largest fish you will ever see. □



Update: Round Valley Lake Trout

MICHAEL WELSHKO

Crew working a gill net on Round Valley Reservoir. ROBERT SOLDWEDEL

Lake trout have inhabited the waters of Round Valley Reservoir, a deep 2350-acre impoundment near the town of Lebanon in Hunterdon County, since 1977. The first stocking of 7300 yearling lake trout and their subsequent growth and survival were reported on in previous articles (May-June 1978 and March-April 1979) in *New Jersey Outdoors.* This initial planting of yearling lake trout (four to seven inches in length) was the culmination of work and research by the Division of Fish, Game and Wildlife biologists to determine the suitability of Round Valley Reservoir's environment for the introduction of this exotic. Sampling of the water temperature (lake trout require colder water than either brown or rainbow trout) and dissolved oxygen (oxygen in water is essential for fish survival) revealed conditions that would be suitable as lake trout habitat. Forage fish, in the form of alewife herring, were captured at depths where these favorable water temperatures and adequate dissolved oxygen occurred. Habitat suitable for the lake trout in Round Valley during the summer months, the most critical period for their survival, was determined to be from approximately the 35-foot depth down to the bottom at 160 feet. Based on these temperature and oxygen conditions, the available summer habitat for lake trout encompasses more than half of the Reservoir's volume.

Since March 1977, annual spring releases have resulted in the addition of nearly 40,000 yearling lake trout. The fish in each stocking other than the first have been marked by clipping various fins to enable the determination of each fish's age and stocking history when recaptured. This clip does not impair the fish's ability to grow or swim , and is a well established technique used by fishery management professionals across the country.

To date, lake trout stocked in Round Valley have been marked by a clip of the adipose, left ventral, right ventral and right pectoral fins. The yearling lake trout raised at the Hackettstown hatchery were marked by a left pectoral fin clip before their stocking this past March.

The program of raising, stocking, and monitoring the lake trout population is covered in a Federal-Aid-to-Fisheries research project entitled "Lake Trout Stocking Evaluation" whose objective is to determine the feasibility of managing for lake trout in Round Valley Reservoir. In order to gather the necessary data on the lake trout survival, growth, and food preference, Division personnel sample the lake trout population annually, using gill nets of different mesh sizes to capture the various ages and sizes of the lakers. The November 1980 sampling found that the lakers stocked in 1977 are now, four years later, more than 20 inches long, with some individuals as long as 26 inches and weighing nearly five pounds. The average life span of a lake trout is 12 or 15 years (browns and rainbows live 6 to 8 years), while some rare individual fish live to 30 years. Fish, unlike birds or mammals, continue to grow throughout their entire lives, so it is possible that 10 years from now some Round Valley lakers will weigh more than 20 pounds.

In keeping with their unusually long life span, lake trout, unfortunately, do not mature and spawn until they are at least five

PAT HAMILTON

A lake trout showing a clip of the left ventral fin, stocked in 1978.

WELSHKO

Round Valley Lake Trout, ages 1 to 4 from bottom to top.

MICHAEL WELSHKO

Lake Trout coloration—light spots on a dark grey background.

years old (brown, rainbow, and brook trout mature and spawn when two years old). During this five-year interval before their first spawning, lake trout are subject to various types of mortality, both natural and human-associated. Consequently, by the time a year class of lakers matures there may not be enough left to reproduce successfully.

The Lake trout is the only trout species that can possibly spawn in a lake. Brown and rainbow trout are stream spawners and will not reproduce in lake conditions.

Lake trout are quite vulnerable to angling and many are being caught each year. Fortunately, most of these are being returned to the water but some are not. In addition to it being *illegal* to keep them at the present time, anglers who catch and keep lake trout from Round Valley are greatly diminishing their chances of catching a 20-pound lake trout five to ten years from now. Presently, there are plenty of other desirable species to fish for in Round Valley (brown and rainbow trout, largemouth and smallmouth bass, to name a few). To take a four- or five-year old lake trout which weighs three to four pounds when that fish has the potential to live and grow another eight to ten years and reach 20 pounds is not only illegal, but simply not in the angler's best interest.

Anglers who want to aid the lake trout program and discourage the illegal taking of lake trout are encouraged to participate in the HOW (Help Our Wildlife) program, created by the National Rifle Association. This program provides a means by which sportsmen can help weed out the violators who are degrading their sport. The concerned sportsman fills out a cooperative violation report card (available from the Division of Fish, Game and Wildlife's Trenton office or the District Law Enforcement Offices) and through reporting of this kind the illegal taking of lake trout can be curtailed.

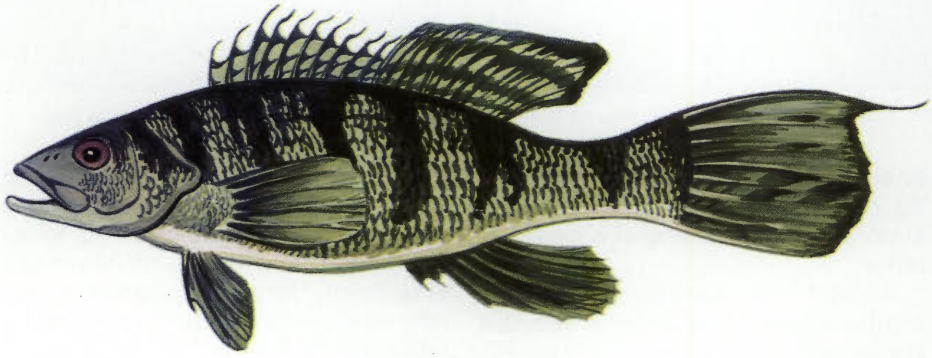
Another problem is that a number of lake trout are dying after being hooked and released, a situation which in itself, may become a serious obstacle to the establishment of a lake trout population. Nearly half of the larger lake trout examined from the gill net survey have a hook or the remains of one in the stomach. One fish examined contained three separate hooks. While this is encouraging in that the lakers so hooked were in good health and apparently suffering no ill effect for the experience, it also indicates that a number of lake trout being caught is substantial. Reports of anglers catching 20 or 30 lake trout in one day's fishing are all too common. The implications are obvious. Therefore, we ask that, until the season is opened for lake trout, anglers refrain from actively fishing for them but if one is accidentally caught then follow this procedure to ensure their maximum chance for survival. If the fish is lip hooked, without removing the fish from the water gently ease the hook or lure from the fish's mouth using long-nose pliers and/or the device made specifically for that purpose. If the fish has swallowed the hook, which often happens when fishing in deep water with live bait, then also without removing the fish from the water, clip the line as close to the fish's mouth as possible.

Future research and management of the Round Valley lake trout population will be directed toward several goals. One will be to maintain the unique aquatic habitat present in Round Valley so that it continues to provide for the maximum angling diversity that a two-story lake offers. Second, as the first year-class of lake trout approaches sexual maturity, efforts will be made to locate spawning areas and ascertain whether successful reproduction takes place. In coming years, as larger numbers of lake trout approach spawning size, a program of capture and spawn-taking will be initiated so as to make our program independent of outside sources of the species. Continual stocking is deemed necessary since other researches have shown that nature alone cannot provide enough lake trout to meet angling needs.

With these management goals in mind, regulations will be established in the future to provide for the first New Jersey lake trout angling season. With the cooperation of the anglers, future years will probably see a highly successful lake trout program; and with any luck at all the "wild" progeny of the hatchery-reared lake trout will become a permanent part of the Round Valley Reservoir fauna. □

Continued from page 5

SEA BASS



BIOLOGY

Common names: ***black sea bass, blackfish***
Scientific name: ***Centropristes striatus***
Range: northern Florida to Cape Cod
Size: Sea bass can reach 24" and a weight of about 7½ pounds. Length/weight relationship; 12" = 1 lb.;18" to 20" = 3 lbs.
Food: Basic foods consist of crabs, lobsters, shrimp, and various mollusks.
Migration: Starting about mid-May, sea bass move inshore and to the north. In late October or early November, they move offshore and southward.
Habitat: Sea bass are bottom feeders and prefer hard bottom types. They can be found in coastal bays in a few feet of water or in offshore waters between the 30- and 70-fathom line. Sea bass gather around wrecks and wharf pilings.
Spawning: Spawning takes place during May and June. The eggs are buoyant and hatch in approximately 75 hours.

Sea bass are extremely hardy. They are able to withstand low water temperatures, wide pH ranges, low oxygen levels and high nitrite and nitrate levels for short durations. They need little room for survival and if necessary can exist with small amounts of food.

RECREATIONAL AND COMMERCIAL IMPORTANCE

The sea bass has been a mainstay of party boat anglers who fish New Jersey's offshore wrecks. It is occasionally taken in good numbers by fishermen drifting for fluke in coastal bays. In 1979, sea bass ranked 6th among New Jersey's gamefishes with a total catch of 391,000 fish.

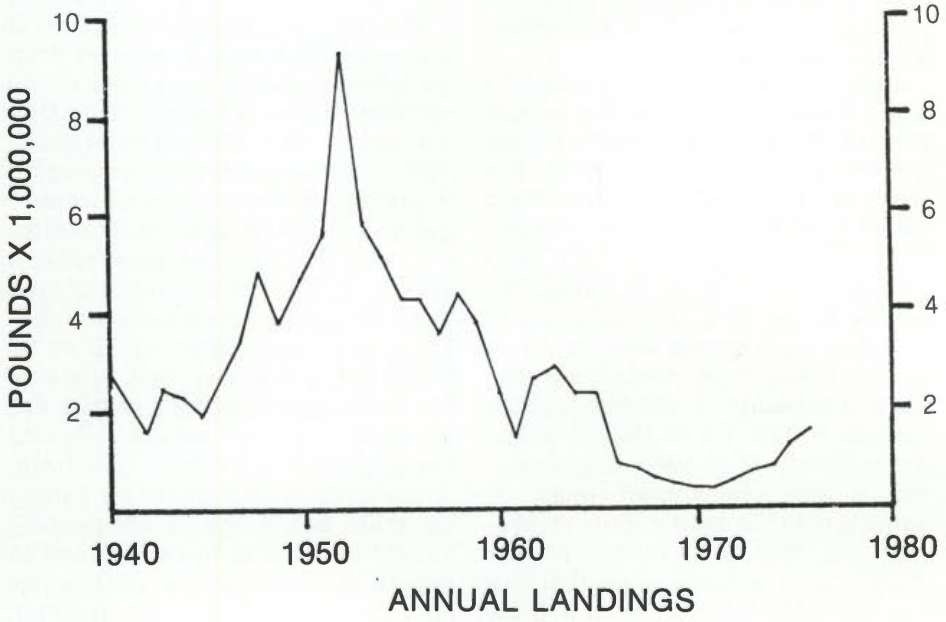
The peak in commercial landings of sea bass was in the 1950s. Declines in landings after this peak were due to a reduction in fishing effort. The primary gear used for catching sea bass is pots, although 20 percent of the harvest is taken by offshore trawlers fishing for other species. The principal fishing grounds are located off the mouth of Delaware Bay.

FISHING FACTS AND TECHNIQUES

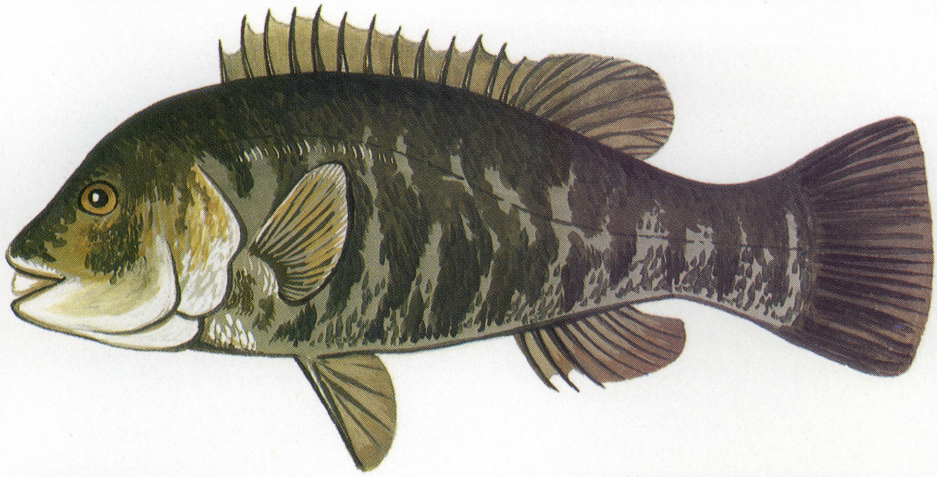
Sea bass, like many other bottom dwellers, congregate around underwater obstructions. Although small sea bass are often taken by fluke anglers in coastal bays, most are caught over offshore wrecks. This is an excellent species for the young, beginning angler, for sea bass bite readily, provide fast and continuous action and put up a minimum of fight. Sea bass will take a wide variety of bait, including clam, squid, and bloodworms, as long as it is kept on or near the bottom. Any common bottom rig with size 1/0 hooks can be effective. Use of two or three hooks will reduce bait stealing and will often produce multiple catches. The best gear for offshore fishing is a short boat pole with a light conventional reel. Sea bass may be taken from May to November, with peaks usually coming in the spring and fall. The most productive catches are taken on party boats whose captains have a thorough knowledge of local wrecks.

ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hill (art), Barry Preim (graph), Mike Kessler, Bigelow and Schroeder (1953), Hildebrand and Schroeder (1972), McHugh (1977), Kendall (1977), Breder (1948).



TAUTOG



BIOLOGY

Common names: ***tautog, saltwater chub, black porgy, blackfish***
Scienfitic name: ***Tautoga onitus***
Range: Nova Scotia to South Carolina
Size: Tautog average about 2 to 4 pounds; anything over 10 pounds is considered large. The maximum recorded length and weight is 36½ inches at 22½ pounds.
Food: Chiefly mussels, crabs, sand dollars, scallops, amphipods, shrimps, isopods, and lotbsters. The smaller lobsters are eaten whole, larger ones are cracked with their powerful crushing teeth.
Migration: Tautog are not seen inshore before late April or after November. During winter, they are generally in deeper waters, remaining quite motionless; otherwise, they tend to remain in a local area.
Habitat: The tautog is a coastal fish, usually not more than 3 to 4 miles offshore and generally no deeper than 20 to 60 feet. They are found on steep rocky bottoms, submerged wrecks, offlying ledges, and around piers, docks, and mussel beds.
Spawning: Most tautog spawn in June. Their eggs are buoyant and hatching occurs in 42 to 45 hours.

RECREATIONAL AND COMMERCIAL IMPORTANCE

The tautog is of minor importance in New Jersey's commercial landings. Over the past 40 years catches have not varied much. The majority of the catch is taken from inshore areas in pots and traps set for lobster.

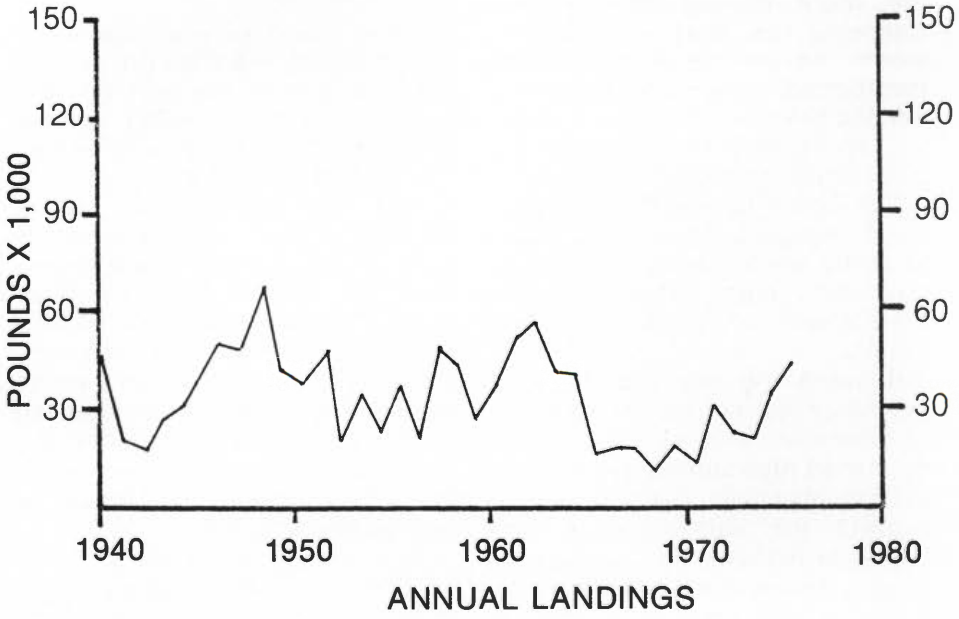
Although the blackfish is an extremely important game fish in northern states, ranking in the top 10, it is of minor importance in New Jersey. In 1979, an estimated 382,000 were caught by sportfishermen in Jersey waters. Only a select number of anglers using specialized techniques fish for and catch tautog in this state.

SPORTFISHING FACTS AND TECHNIQUES

There are two seasons for catching blackfish, in the spring from April to June and in the fall from October to December. An occasional fish may be taken during the summer. In New Jersey, most fishing for tog is done on party boats; however, they are also taken from the bank or jetties. Blackfish feed and seek shelter on the bottom in wrecks or rockpiles. For this reason, a heavy line capable of withstanding abrasions from underwater obstructions is needed. Rigs should be simple and inexpensive, since many are entangled and lost. A common rig is a single hook of medium size on a short leader attached directly to a 2- to 6-ounce sinker. When fishing from a jetty, cast your rig near the rocks, for this is where tog congregate. Party boats fish wrecks from the shore to 10 miles off. The ultimate bait is live green crabs, but fiddler crabs and clams are also excellent. Bloodworms, sand crabs, and squid may also be used with success. Keep the bait on the bottom; jigging is not necessary. The hardest part of tog fishing is hooking them. On some days, they bite briskly and the hook should be set immediately. Other times, an angler must wait till the second strike before hooking. Occasionally, they may just mouth the bait. The angler who learns when to use the various hooking techniques will always return to the dock with a good catch. When a tog is hooked, keep the line taut and try to get the fish off the bottom and away from obstructions quickly.

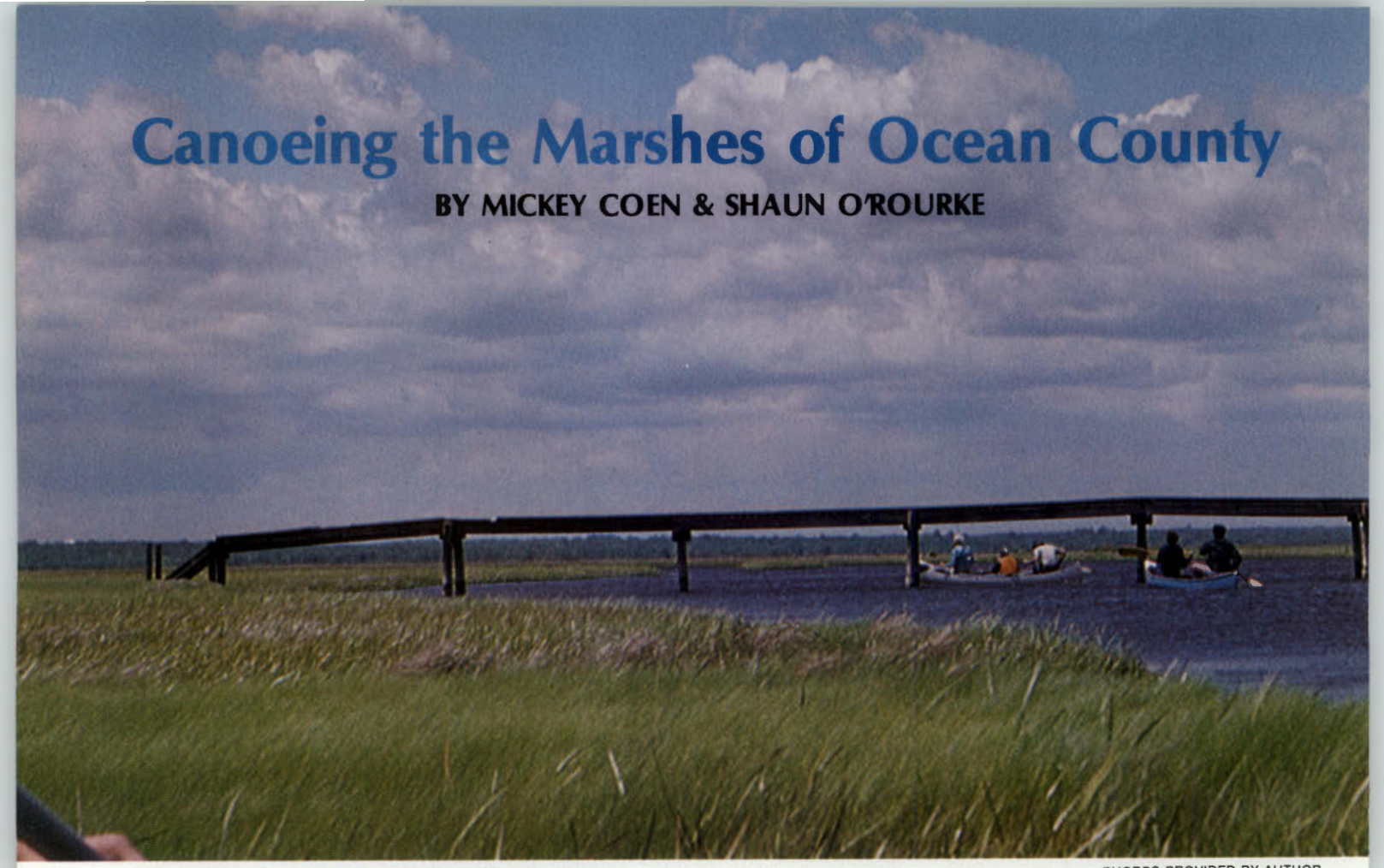
ACKNOWLEDGEMENTS AND REFERENCES

Anthony Hillman (art), Barry Preim (graph), Mike Kessler, Bigelow and Schroeder (1953), Hildebrand and Schroeder (1972), Breeder (1948), McHugh (1977). Compiled by Raymond Townsend and Bill Figley.



Canoeing the Marshes of Ocean County

BY MICKEY COEN & SHAUN O'ROURKE



PHOTOS PROVIDED BY AUTHOR

As we approach the footbridge it seems so close, yet because of the winding channels we never quite seem to get there.

Every year, thousand of canoes ply hundreds of river miles on waterways throughout north, south, and central Jersey. On water weekends a riverneer can just about walk downstream from canoe to canoe along the more heavily used waters. Canoeing has taken the state by storm. As an inexpensive, easily transported, safe, adaptable craft, nothing beats a canoe, but it is getting so it's hard to find peace and quiet where once was solitude.

The Ocean County Parks Department naturalists have found places to canoe where peace and solitude still do reign. They are the marshlands of Southern Ocean County.

Between the sea and the land, behind protective barrier beaches, lie extensive marsh wetlands broken by myriad meandering riverlets and natural channels. State laws now protect the salt marshes. The Wetlands Act and the Coastal Area Facility Review Act (CAFRA) are designed to control development so as to prevent deterioration of our remaining marshlands. Many wetlands areas in northern Ocean County were lost before the application of these laws but through acquisition and wise lawmaking, the rest have been protected.

We've found several trips within Ocean County marshes which stand out even among the best wild and scenic rivers in the country. You can get out on those places and be literally beyond civilization.

Now, at first mention, Jersey marshes conjure up visions of millions of mosquitoes; great greenhead fly hordes; little, run-down hunting shacks; egrets; and miles of "stinking, bug-infested swamps." Local "experts" who live in the tidal estuaries laugh when one suggests canoeing them. They call the idea "pure suicide." "If the insects don't get you, then the maze of backwaters will."

Well, undaunted, we followed their cautions to research routes and routines. Using topographic maps from the state Geologic Survey, NOAA Navigational guides, shellfishery charts, DEP aerial photos, and an Ocean County Roadmap (which, by the way, turned out to be the best guide of them all), we found two suitable wetlands sections opposite Long Beach Island.

The preferred areas have protected marshlands broken by passable channels so as to avoid traversing open bay waters as much as possible. The northern route requires no bay travel. Depending on the direction of the wind, one enters and exits the marshes either off Strafford Avenue at the "bridge to nowhere" in Manahawkin or off Bay Avenue at Barnegat Landing. The usual trip, from south to north, passes through Gunning River, Settin Pond, Crooked Creek, Turtle Cove, and Big Flat Creek, before exiting the wetlands at the landing whose location is marked by an orange-brown roofed pavilion. This is one of the few areas in the state where salt marsh hay from *spartina*

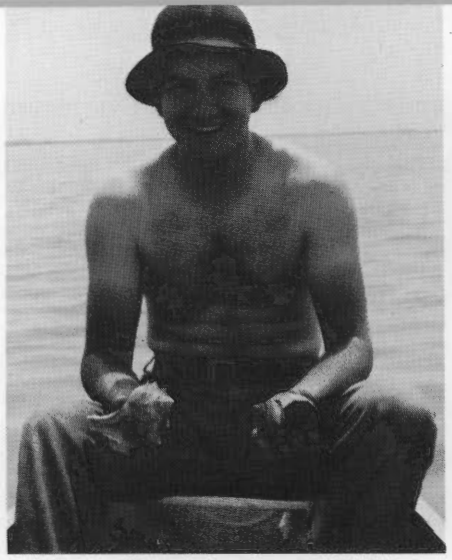
grass (cord grass) is still collected. If you're lucky, you might see the tractor working on the marshes.

The southern route, in the wetlands to the north of Great Bay Wildlife Management Area, requires some open bay travel. Again, depending on the wind, you can get into the marsh area from the end of Great Bay Blvd. in Tuckerton and get out at the public boat landing area in Eagleswood Twp. on Westecunk Creek. On this Little Egg Harbor trip, you must canoe across more open water, but this builds excitement and adventure as you navigate to barely visible sedge islands over crystal-clear tidal shallows alive with bay life. If wind or weather change, boat landings in Tuckerton, Parkertown, and Long Beach Island are never very far away.

Needless to say, no words describe these trips. Both areas are outstanding from the standpoint of outdoor recreation and nature-study aesthetics. The extensive wetlands engulf the canoeist in another world rarely visited by the average person. On one trip we stopped at a pure white sandbar carpeted with spider crab shells, which disappeared as we ate lunch. Instead of speeding by power boat through deep, invisible, channels, in the canoe you enjoy a slow progression over shallow, isolated flats where natural life teems. On a single trip we counted 25 species of birds, 17 molluscans, hundreds of blueclaw crabs, many diamondback terrapins, two dogfish, an angry sally-growller and a huge stingray.

A word on common sense. Our marsh canoe trips take about five hours. Weather and tides must be favorable. Participants must carry compasses and maps in case of fog. Winds must be watched carefully. Nature must be left undisturbed, and that goes for private property too. What you bring in, you take out, and by all means follow boat safety procedures.

For additional information on canoeing in New Jersey, write for the color brochure (which includes a Pinelands rivers map), to:
CANOEING THE PINELANDS RIVERS
Green Acres Program
P.O. Box 1390 Trenton, N.J. 08625



The bay bottom is so clear, you can see all sorts of creatures crawling about. Shaun O'Rourke, Naturalist with Ocean County, holds two New Jersey whelks—one knobbed, and one channeled.

Micky Coen, Naturalist with the Ocean County Park System, handles two common Little Egg salt marsh-denizens, a dogfish and a diamondback terrapin.

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it's all about the wildlife of Cape May County

Cape May County is justly famous as one of the best places in the world for birds, and can also boast of an abundance of other wildlife. The Wetlands Institute is pleased to announce a new book entitled, "The Wildlife of Cape May County, A Habitat Guide To The Vertebrate Fauna". Designed to acquaint the reader with all the wildlife of the county, the book is full of hints on where and how to find your favorite wild creatures.

Whether you are looking for salamanders or shorebirds, the book's text and centerfold map of the county indicate the best locations and habitats to explore. A unique feature of the book is the wildlife listings which easily reference each species by season, abundance and habitat. Published in conjunction with Stockton State College, the 93-page field guide describes over 600 species of wildlife occurring in the county and southern New Jersey. Sixty black and white photographs of fish, reptiles, amphibians, birds and mammals illustrate the text.

The authors, Joseph Lomax, Joan Galli, and Anne Galli are all professional biologists who have long studied and enjoyed the wildlife resources of Cape May County. To order your copy, send $7.00 (includes postage) to:

THE TIDEPOOL SHOP
The Wetlands Institute, Box 398, Stone Harbor, N.J. 08247, or Center for Environmental Research, Stockton State College, Pomona, NJ 08240. Please allow three weeks for delivery.

Continued from page 17

water safety

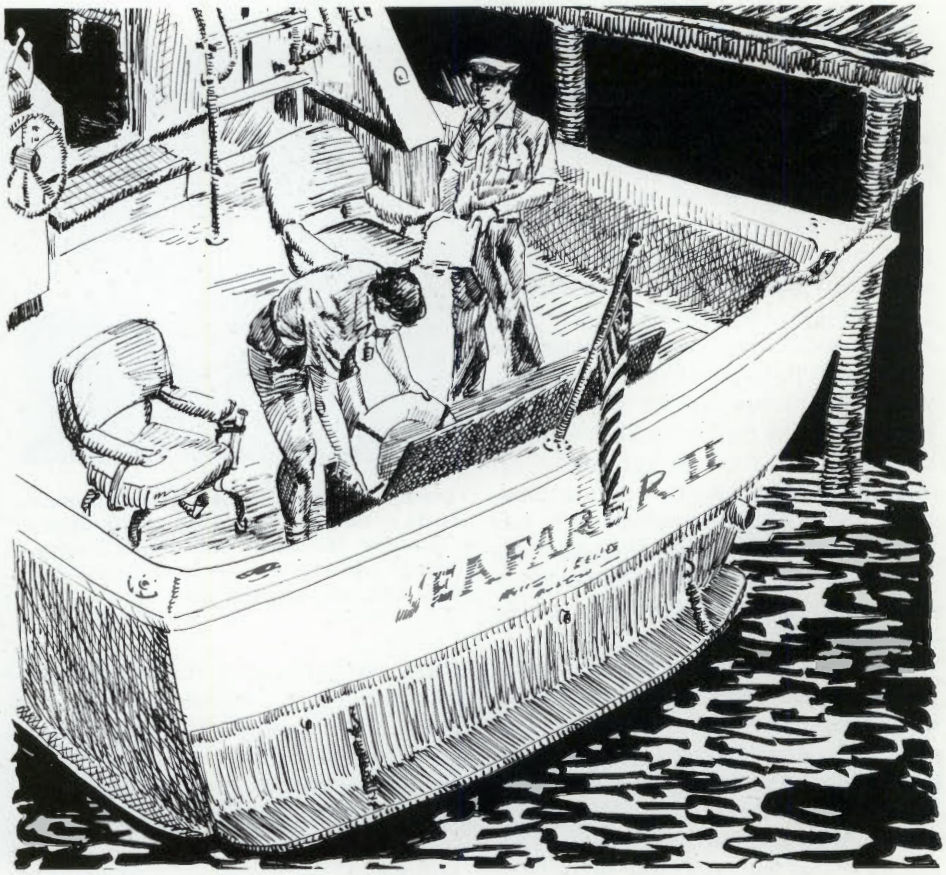
and provide instruction to 50,000 children.

The Coast Guard Auxiliary is a civilian organization under the direction of the Commandant of the U.S. Coast Guard. New Jersey is part of the 3rd Coast Guard District, with headquarters on Governor's Island, New York. Always striving for greater safety for those who participate in boating, the auxiliary's three primary areas of concentration are Education, Examination, and Operations.

The courses available are designed to accommodate every age group and level of recreational boating, from courses such as "Water-N-Kids", a one-lesson cartoon presentation for kindergarten through 3rd graders, to 13-lesson courses named Boating Skills and Seamanship, and Sailing and Seamanship. These latter two courses start with a nucleus of six lessons concentrating on basic boating and sailing skills, then lessons 7 through 13 are options for the students' further development. Upon completion of the basic courses the student is awarded the respected "Basic Seamanship Certificate."

The Coast Guard Auxiliary also offers a free nonobligatory examination to boaters and sailors alike annually. This "Courtesy Marine Examination" is a valuable exchange of boating and sailing information.

A qualified C.G. Auxiliary examiner will indicate to you if your vessel meets legal state and federal regulations. If any safety deficiencies are found he simply advises you on the matter for correction and no report is made to any law enforcement agency; however, if at the time of the examination your vessel meets the "Courtesy Marine Examination" standard, you are awarded the "Seal of Safety" decal. This is nationally recognized as an indication that your boat has meet the state requirements and has exceeded federal regulations.



We have all heard the expression about an ounce of prevention. This goes double with water-related activities. If a problem should occur on or in the water we can't pull over or walk away from it; so, with a little forethought we can better prepare ourselves. Prepare ourselves to react to a situation by a trained reflex instead of panic.

Along with reading about our chosen sport and joining organizations or clubs, we can take advantage of the courses and examinations that are offered to us. By doing some or all of these things perhaps we can keep swimming and boating the activities they were meant to be: A means of exercise, sociability, and just plain fun. Enjoy!

For more information and brochures on water safety, boating and the Coast Guard Auxiliary, call or write:

3d Coast Guard District (NA)
Governors Island
New York, N.Y. 10004
(212) 264-4905

3d Coast Guard District (SA)
King and Cumberland Sts.
Gloucester City, N.J. 08030
(609) 456-7812

U.S. Coast Guard Auxiliary (Division VIII)
Attn: Pamela Lange
431 Ravenwood Place
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FRONT COVER

Sailing Anyone? Photographed by Al Nunes-Vais

INSIDE BACK COVER

Bats—Illustration by Carol Decker. (See article on page 22.)

BACK COVER

LUCY—Photographed by Richard L. Ditch. (See article on page 2.)